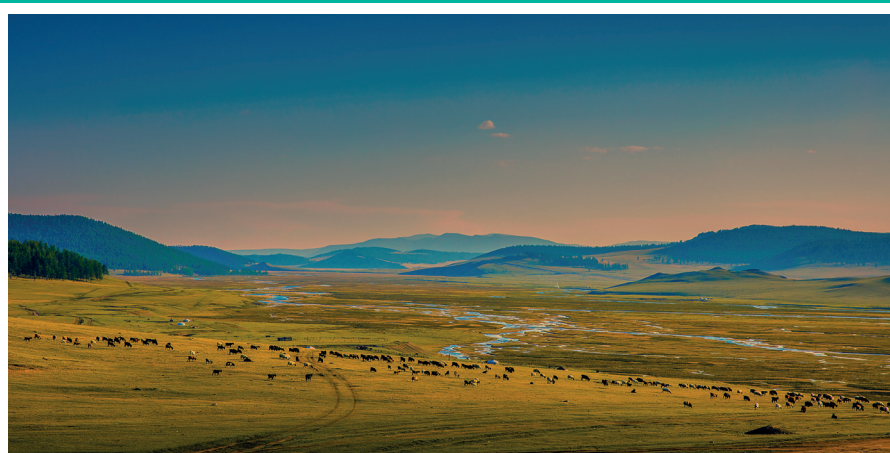


UNECE

# Mongolia

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## Mongolia



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ECE Information Unit  
Palais des Nations  
CH-1211 Geneva 10  
Switzerland

Tel.: +41 (0)22 917 44 44  
Fax: +41 (0)22 917 05 05  
Email: [info.ece@unece.org](mailto:info.ece@unece.org)  
Website: <http://www.unece.org>

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## *Foreword*

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The United Nations Economic Commission for Europe (ECE) Environmental Performance Review (EPR) Programme provides assistance to its member States by regularly assessing their environmental performance. Countries then take steps to improve their environmental management, integrate environmental considerations into economic sectors, increase the availability of information to the public and promote information exchange with other countries on policies and experiences. Over two decades, these reviews have resulted in stronger institutions for environmental management, improved financial frameworks for environmental protection and greening the economy, advanced environmental monitoring and information systems, better integration of environmental concerns into sectoral policies, strengthened public participation and increased international cooperation across the ECE region.

This EPR of Mongolia, conducted upon request of the Government of Mongolia, is notable as Mongolia is the second country outside the region to request an EPR from ECE, and the process was undertaken in cooperation with the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). The EPR process has brought together good practices and a wealth of experience from both ECE member States and Mongolia in a process of a mutually-enriching learning exchange for the benefit of our common environment.

This review is also special, since it was conducted at the beginning of our efforts to support the implementation of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), when countries are shaping their national targets and setting up the policy frameworks and institutional mechanisms for implementation and follow-up. Here, Mongolia is among the frontrunners, having integrated the SDGs into its key policy document – the 2016 Mongolia Sustainable Development Vision 2030 – and demonstrating remarkable progress with awareness and ownership of the SDGs. This EPR equips the Government and interested stakeholders in Mongolia with recommendations to inspire future work on the achievement of the goals and targets of the 2030 Agenda. The review also contributes to the ESCAP-led Sustainability Outlook for Mongolia and has an aim to feed into the Pathways for Implementation of the Internationally Agreed Commitments of Mongolia in the future.

ECE is honoured to offer its flagship product to the Government of Mongolia. I trust that this review will serve as a powerful tool to support policymakers and representatives of civil society in their efforts to improve environmental governance and achieve the SDGs in Mongolia. ECE wishes the Government of Mongolia further success in carrying out the tasks involved in meeting its environmental and sustainable development objectives, including through the implementation of the recommendations in this review. I also hope that the lessons learned from the peer review process in Mongolia will benefit countries throughout the ECE region.

Olga Algayerova



Executive Secretary  
Economic Commission for Europe



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# *Preface*

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This Environmental Performance Review of Mongolia takes stock of progress made by the country in the management of its environment since 1987. It covers legal and policy frameworks, compliance assurance, greening the economy, environmental monitoring, public participation and education for sustainable development. Furthermore, the EPR addresses issues of specific importance to the country related to air protection, biodiversity conservation and water, waste and land management. It also examines the efforts of Mongolia to integrate environmental considerations into its policies in the forestry and health sectors and highlights the progress achieved in the management of disaster risk associated with natural and human-made hazards. The review further provides a substantive and policy analysis of the country's participation in international cooperation on the environment, with a specific focus on the three Rio Conventions.

The successes of Mongolia in the achievement of the Millennium Development Goals are highlighted, as well as the challenges to be addressed by the country when implementing the globally-agreed Sustainable Development Goals.

The EPR of Mongolia began in January 2017 with a preparatory mission to agree on the structure of the report and the schedule for its completion. A team of international experts took part in the review mission from 22 to 30 May 2017. In September 2017, the draft report was submitted to Mongolia for comments and to the ECE Expert Group on Environmental Performance Reviews for consideration. During its meeting on 25 and 26 October 2017, the Expert Group discussed the draft report with the delegation from Mongolia, focusing on the conclusions and recommendations made by the international experts. The recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the ECE Committee on Environmental Policy at its twenty-third session on 16 November 2017. A high-level delegation from Mongolia participated in the peer review and the Committee adopted the recommendations in this report.

The Committee and the ECE secretariat are grateful to the Government of Mongolia and its experts who worked with the international experts and contributed their knowledge and expertise. ECE would also like to express its appreciation to the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety and the German Federal Environment Agency for their support by providing funds through the Advisory Assistance Programme. Sincere thanks also go to France, Germany, Portugal and the United Nations Environment Programme (UNEP) for having provided their experts and to the United Nations Development Programme (UNDP) for its support of this review.

ECE also takes the opportunity to thank Portugal and Switzerland for their general financial support to the EPR Programme in 2017 and expresses its deep appreciation to Belarus, Estonia, Georgia, Germany, Hungary, Italy, Montenegro, Republic of Moldova, Romania and Switzerland for having provided their experts for the ECE Expert Group on Environmental Performance Reviews, which undertook the expert review of this report.

## TEAM MEMBERS



Mr. Antoine Nunes	ECE	Team leader
Ms. Iulia Trombitcaia	ECE	Project coordinator
Ms. Oksana Rott	ECE	Logistics coordinator
Ms. Narantuya Davaa	ECE consultant	Local coordinator
Mr. Jyrki Hirvonen	ECE	Introduction
Ms. Iulia Trombitcaia	ECE	Chapter 1
Mr. Nicholas Bonvoisin	ECE	Chapter 2
Mr. Dieter Hesse	ECE consultant	Chapter 3
Mr. Matthew Billot	UNEP	Chapter 4
Ms. Angela Sochirca	ECE	Chapter 5
Ms. Elisabete Quintas	Portugal	Chapter 6
Ms. Telma Branco	Portugal	Chapter 7
Ms. Olivera Kujundzic	ECE consultant	Chapter 8
Mr. Volodymyr Pushkar	Germany	Chapter 9
Mr. Juraj Farkas	ECE consultant	Chapter 10
Mr. Zbigniew Niewiadomski	ECE consultant	Chapter 11
Mr. Leilei Chen	ECE consultant	Chapter 12
Ms. Sarangoo Radnaaragchaa	ECE	Chapter 13
Mr. Armen Rostomyan	ECE consultant	Chapter 14
Ms. Sylvie Eymard	France	Chapter 15

Ms. Sainbayar Auysh compiled Annex II.

Ms. Naranmandakh Baatar provided assistance to the ECE secretariat for the preparation of this report.

## EXPERT GROUP FOR THE EPR OF MONGOLIA



Ms. Marina Philipjuk	Belarus	Expert Group
Mr. Harry Liiv	Estonia	Expert Group
Ms. Mariam Makarova	Georgia	Expert Group
Mr. Hans-Joachim Hermann	Germany	Expert Group
Mr. Andras Guti	Hungary	Expert Group
Ms. Alessandra Fianza	Italy	Expert Group
Ms. Olivera Kujundzic	Montenegro	Expert Group
Mr. Adrian Panciuc	Republic of Moldova	Expert Group
Ms. Luminita Ghita	Romania	Expert Group
Mr. Xavier Tschumi Canosa	Switzerland	Expert Group
Ms. Christine Kitzler	ECE	Invited reviewer
Ms. Carolin Sanz Noriega	ECE	Invited reviewer
Mr. Florian Steierer	ECE	Invited reviewer
Mr. Yeruult Bayart	Mongolia	Head of Delegation
Ms. Narantuya Davaa	Mongolia	Delegation
Mr. Jargalsaikhan Gundegmaa	Mongolia	Delegation
Mr. Batjargal Khandjav	Mongolia	Delegation



---

**LIST OF CONTRIBUTORS****Governmental authorities, organizations and institutions**

## Ministry of Environment and Tourism

Ms. Ariuntuya Dorjsuren  
Ms. Tungalag Ulambayar  
Mr. Yeruult Bayart  
Ms. Bulgan Tumendemberel

Ms. Oyun Adiya  
Mr. Enkhbat Altangerel  
Ms. Sainbayar Auyskh  
Ms. Tseepil Avirmed  
Ms. Naranchimeg Bagadain  
Mr. Otgonsuren Batgombo  
Ms. Sarantsetseg Borchuluun  
Mr. Radnaabazar Chadraabal  
Ms. Elbegsaikhan Dashdorj  
Mr. Bayarbat Dashzeveg  
Mr. Erdenebayar Davaasambu  
Mr. Dechin Davaatseren  
Mr. Tengis Delgertsogt  
Mr. Shijir-Erdene Dolgorsuren  
Ms. Gundsambu Dorj  
Mr. Erdenekhuu Erdene-Ochir  
Ms. Tuvshinjargal Ganbaatar  
Ms. Enkhatsral Ganbat  
Mr. Enkhmunkh Ganbold  
Mr. Nyamdavaa Gendenjav  
Ms. Oyungerel Gombosuren  
Ms. Khorolmaa Gombosuren  
Mr. Erdenebulgan Luvsandorj  
Ms. Maitsetseg Khadbaatar  
Ms. Sevjidmaa Khajidmaa  
Mr. Batjargal Khandjav  
Ms. Shurentsetseg Khurelbaatar  
Mr. Tulga Mendjargal  
Mr. Otgontugs Monhoodoi  
Mr. Battulga Namjilmaa  
Mr. Jamiyankhuu Narmandakh  
Mr. Enkhtaivan Noosgoi  
Ms. Narangerel Oidov  
Ms. Sarangoo Rentsenkhand  
Ms. Shinezul Sambuudorj  
Ms. Bayarkhuu Sandagdorj  
Ms. Bayasgalan Saranjav  
Mr. Myagmar Shar  
Mr. Munkh-Orgil Sodnomtsog  
Mr. Bat-Erdene Sukhee  
Mr. Davaanyam Tegshjargal  
Mr. Tuvshinbat Tsedendash  
Mr. Tsengel Tsegmid  
Ms. Byambasuren Tseren  
Ms. Uranchimeg Tserendorj  
Mr. Chuluunbaatar Tsevee-Oirov  
Mr. Anand Tsog

---

	Mr. Gerelt-Od Tsogtbaatar Mr. Boldbaatar Turmunkh Ms. Javzan Vandansuren
Ministry of Foreign Affairs	Mr. Ankhbayar Tsog-Ochir
Ministry of Construction and Urban Development	Mr. Enkhtuvshin Agvaan Mr. Zanabazar Dondovtseren Ms. Batchimeg Renchinsuren
Ministry of Mining and Heavy Industry	Ms. Chingee Bayartogtokh Mr. Tsogtbaatar Chojinjav Mr. Ganbaatar Jamiyan
Ministry of Education, Culture, Science and Sports	Ms. Bolormaa Sambuudorj Ms. Amarjargalan Tumurbaatar
Ministry of Health	Ms. Bayasgalan Dashnyam Ms. Urantsetseg Shagdar Ms. Enkhzaya Taznaa
Ministry of Energy	Ms. Uemaa Gantulga Mr. Boldkhuu Nanzad
Ministry of Roads and Transport Development	Ms. Gerelnyam Daramragchaa Mr. Sereeter Jigjee Mr. Munkhbat Puntsaa
Ministry of Food, Agriculture and Light Industry	Ms. Munguntsatsal Altan-Ochir Mr. Batbaatar Bayarmagnai Mr. Batmunkh Damdindorj Ms. Amarjargal Danaaragchaa Ms. Khishigjargal Dashpuntsag Mr. Batkhuyag Dorjpalam Ms. Erderetsetseg Gunchinjav Ms. Kyenjyegul Khavdala Mr. Munkhnasan Tsevegmid
Ministry of Labour and Social Protection	Mr. Altantulga Bor
National Development Agency	Mr. Munkhbold Adiya Ms. Doljinsuren Jambal
National Statistics Office	Ms. Oyunjargal Mangalsuren Ms. Ganchimeg Mijiddorj Mr. Batzorigt Yunden

## General Tax Office

Mr. Bold Baatar  
Ms. Enkhtuya Dashdavaa

## Agency for Standardization and Metrology

Mr. Bilguun Boldbaatar  
Mr. Batzorig Gombodorj  
Ms. Gantsetseg Sukhbaatar

## General Agency for Specialized Inspection

Ms. Bayasgalan Batbayar  
Ms. Enkhgerel Batkhuyag  
Mr. Nyamdavaa Chuluun  
Mr. Tserendash Davaa  
Ms. Narantuya Jadamba  
Ms. Narangerel Namsrai  
Mr. Erdenesukh Nergui  
Mr. Batbayar Nyamtseren  
Ms. Khongorzul Sukhbaatar  
Ms. Munkhbayar Ulziibayar

## National Agency for Meteorology and Environmental Monitoring

Mr. Batbayar Jadamba

## Information and Research Institute of Meteorology, Hydrology and Environment

Mr. Tsogt Jamba  
Mr. Odbayar Mishigdorj

Agency for Land Administration and Management,  
Geodesy and Cartography

Mr. Gankhuyag Radnaabazar  
Ms. Dulamsuren Ulziiduuren

## National Emergency Management Agency

Mr. Batbayar Batjargal  
Mr. Bayanmunkh Buyantogtokh  
Ms. Ariunaa Chadraabal  
Mr. Lkhamjav Chinbaatar  
Mr. Baasansuren Demberelnyam  
Ms. Badamsuren Dulamragchaa  
Mr. Altangerel Dulamsuren  
Ms. Bazarragchaa Duudgai  
Ms. Amarzaya Purev  
Mr. Munkhtulga Sharibuu

## Mineral Resources and Petroleum Authority

Mr. Altsukh Baatar  
Ms. Kherlen Chultemdagva

## Forest Research and Development Centre

Mr. Khosbayar Battuvshin  
Mr. Michid Khaltar

## Environmental Information Centre/Division

Ms. Narangerel Zagdaa

---

National Centre for Communicable Diseases	Ms. Gantsetseg Dorj Mr. Nyamkhuu Dulmaa Ms. Davaalkham Jagdagsuren Ms. Baigalmaa Jantsansengee
National Centre for Public Health	Ms. Enkhjargal Altangerel Ms. Batdelger Shinen
National Committee for Reducing Air Pollution	Ms. Gunbileg Lkhagvasuren
Energy Regulatory Commission	Mr. Tleikhan Almalik Mr. Chimedregzen Baatar Mr. Bolor-Erdene Batbayar Mr. Tuvshinchuluun Erdenechuluun Mr. Jambaa Lkhagva Mr. Atarjargal Tserendnom
Institute of Teachers Professional Development	Ms. Oyuntungalag Orosoo
Vocational Education Policy Implementation Department	Ms. Oyuntsetseg Bar
Nuclear Energy Commission	Mr. Manlajav Gunaajav Mr. Nyamdavaa Enkhgerel
Shastin Clinical Central Hospital	Ms. Delgertsetseg Davaa
National Ozone Authority	Ms. Dulamsuren Dashdorj
Environment and Climate Change Fund	Ms. Saruul Dolgorsuren Ms. Otgontsetseg Dorjderem Ms. Sanaa Enkhtaivan Mr. Ganbaatar Khurelbaatar Mr. Batjargal Zamba
Tuul River Basin Authority	Ms. Battsetseg Batjargal
MGL-Water Corporation	Ms. Erdenechimeg Chuluunbaatar Mr. Bilegsaikhan Gombosuren
Water Services Regulatory Commission	Mr. Purevjav Erdenejav Ms. Gerelchuluun Javzan
Mongolian Academy of Sciences	Mr. Lkhagvasuren Badamjav

Mr. Dugarjav Chultem  
Ms. Urtnasan Mandakh  
Ms. Mandakh Nyamtseren  
Mr. Batkhishig Ochirbat

Implementing Agency of the Capital City Mayor

Mr. Bolor Batbayar  
Mr. Otgonbayar Muuguu  
Ms. Tsolmon Tsogbadrakh  
Ms. Tseveenkhanda Yadmaa

Mayor's Office of Ulaanbaatar City

Mr. Ariguun Sarankhuu

Urban Landscaping Department of Ulaanbaatar City

Mr. Purevdorj Myagmarjav

Water Supply and Sewerage Authority of Ulaanbaatar City

Mr. Orgilt Altankhuyag  
Ms. Khishigjargal Badral  
Mr. Purevjav Bat-Ochir  
Ms. Bolormaa Davadorj  
Mr. Otgonbayar Khayanhyarvaa  
Mr. Baljinyam Yadamsuren

Education and Culture Department, Selenge Aimag

Mr. Jargalsaikhan Jamts

Environment and Tourism Department, Selenge Aimag

Ms. Tsengelzaya Gombosuren  
Ms. Otgon-Erdene Ulzii

State Inspectorate Department, Selenge Aimag

Mr. Ganbold Mongol

Kharaa Intersoum forest unit, Selenge Aimag

Ms. Naran Ravdan

Governor's Office of Bayangol Soum, Selenge Aimag

Mr. Enkhtaivan Dorjsuren  
Mr. Ariunbat Sandagdorj

Eco-school of Bayangol Soum, Selenge Aimag

Ms. Sarangerel Dorjsuren  
Ms. Mungunchimeg Govi  
Ms. Batchimeg Punsaldulam

Mongolian University of Life Sciences

Mr. Buyanzaya Batjargal

Mongolian National University for Medical Sciences

Ms. Delgerzul Lodoisamba

National University of Mongolia

Mr. Bayartogtokh Badamdorj  
Ms. Soninkhishig Nergui  
Mr. Batsaikhan Nyamsuren

---

	Ms. Tungalag Radnaakhand Ms. Enkhdul Tuguu
National University of Science and Technology	Mr. Chuluunkhuyag Sangi
Climate Change and Development Academy	Mr. Dagvadorj Damdin
Ecological Lyceum and the Environmental Education Centre of NUM	Ms. Sunjidmaa Renchin Ms. Buyandelger Tuvduu
Hobby School	Ms. Tselmuun Gal
Ulaanbaatar Public School No. 5	Mr. Gendensuren Namsrai
Projects/Programmes	Mr. Amgalan Altangerel Ms. Chuluunkhuu Baatar Ms. Oyuntulkhuur Bandi Mr. Chimed-Ochir Bazarsad Ms. Badam Delgerbayar Ms. Tsendsuren Dorjgotov Ms. Jess Garana Mr. Davaadorj Gochoo Mr. Ykhanbai Hijaba Mr. Andrew Inglis Mr. Tsogtbaatar Jamsran Ms. Enkhzul Natsagdorj Ms. Bayankhishig Nyamtseren Ms. Ariunbileg Radnaa Ms. Bolor Radnaabazar Mr. Klaus Schmidt-Corsitto Ms. Atantsetseg Sodnomtseren Mr. Khongor Tsogt Mr. Dagvadorj Yarvaan
<b>International organizations</b>	
World Health Organization Mongolia	Ms. Ariuntuya Ochirpurev Ms. Delgermaa Vanya
KfW Mongolia	Mr. Petar Gjorgjiev
Japan International Cooperation Agency (JICA)	Mr. Akihiro Furuta Ms. Satomi Yoshino
Mongolia National Commission for UNESCO	Mr. Urtnasan Norov Ms. Uyanga Sukhbaatar

## United Nations in Mongolia

Ms. Tsetsegmaa Amar  
Ms. Bunchingiiv Bazartseren  
Ms. Nyamjargal Gombo  
Mr. Batnasan Nyamsuren  
Ms. Buyandelger Ulzikhuu

## Asian Development Bank

Ms. Ongonsar Purev

## Embassy of Canada

Ms. Nancy J. Foster

## Embassy of Hungary

Mr. Karoly Domonkos

## Swiss Agency for Development and Cooperation

Ms. Ilaria Dali  
Mr. Erdenesaikhan Nyamjav

**Non-governmental organizations**

## Mongolian Lawyers Association

Mr. Munkhzul Ravdandorj

## Mongolian National Chamber of Commerce and Industry

Mr. Oyunbat Batsaikhan  
Mr. Khosbayar Mangil

## Mongolia Water Forum Ushelts

Ms. Batimaa Punsalmaa

## Waste Recyclers' Association, Leader of EcoPark project

Mr. Lkhanaa Bat-Ulzii

## WWF Mongolia

Ms. Munkhchuluun Basan  
Mr. Batbold Dorjgurkhem

## The Nature Conservancy

Ms. Uyanga Ariya  
Mr. Galbadrakh Davaa  
Ms. Purevdulam Lkhagvasuren  
Ms. Enkhtuya Oidov

## WRG 2030

Mr. Dorjsuren Dechinlkhundev

## Wildlife Conservation Society

Ms. Onon Bayasgalan  
Ms. Enkhtuvshin Shiilegdamba

## Environment and Security Centre of Mongolia NGO

Mr. Erdenesaikhan Naidansuren

## Positive Change NGO

Mr. Simon Zimmermann

---

Movement of Khuvsgul Lake's Owners	Ms. Bayarmaa Byambasuren Ms. Battuya Ganbaatar
Onggi River Movement NGO	Mr. Gansaruul Altangerel
Water Partnership Mongolia	Mr. Basandorj Davaa
Mongolian Environmental Citizens Council NGO	Mr. Battogtokh Balaagan Ms. Erdene Batzorig
Information and Training Centre for Nature and Environment NGO	Ms. Shinetsetseg Erdenebayar
Association of NGOs of Selenge Aimag	Ms. Sarantsetseg Jamsranjav
Mongolia Extractive Industries Transparency Initiative (EITI) Secretariat	Mr. Tsolmon Sharyn
The Business Council of Mongolia	Mr. Chimednyam Purev-Ochir
ARIUN SUVRAGA NGO	Mr. Chagnaadorj Gombo
River Without Boundaries NGO, OT Watch	Ms. Sukhgerel Dugersuren
Transparency Foundation NGO	Ms. Otgonsuren Tsend-Ayush
Mongolian National Mining Association	Mr. Alгаа Namgar
Forest Management Council, NGO	Mr. Dorjtseden Lamjav
National Institute for Development and Environmental Research	Mr. Banzragch Tsened
<b>Private sector</b>	
OSNAAUG	Mr. Batsaikhan Jamsrandorj
Devjikh Khishig cooperative, Khailaast bagh, Zaamar Soum	Ms. Orkhontuul Dashtseren
Khuder Bumbatin Ovoo LLC, forestry professional organization	Mr. Bold-Ochir Lkhamgarav
ULZ-GOL company, Zaamar Soum	Mr. Bayarbold Banzragch



Element LLC	Mr. Dashzeveg Tovron
	Mr. Osorkham Dorj Mr. Nyamaa Tuvshinjargal
Sain Tsaas LLC	Mr. Bilguundari Bold
Environmental Impact Assessment and Consulting "Ecoton" LLC	Mr. Khairat Khavdolda
Ulaanbaatar Shinechlel	Ms. Zulaa Batsukh Mr. Tuvdendorj Magsar

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### PHOTO CREDITS

Ms. Lucille Caillot (photos I, 6, 13.2)  
 Mr. Leilei Chen (photos 7.1, 12.1, 12.2, 12.3)  
 Ms. Sylvie Eymard (photos 9.2, 10.1, 11.1, 11.2, 15)  
 Mr. Juraj Farkas (photo 10.2)  
 Mr. Zbigniew Niewiadomski (photos 3, 8.1, 13.1)  
 Ms. Angela Sochirca (photos 1.1, 1.2, 2, 5.1, 5.2, 7.2, 8.2, 9.1)  
 Mr. Enkhzul Natsagdorj (photo 14.2)  
 Ms. Ariunsanaa Ganbaatar (photo 14.1)

Cover page photos: Mr. Gan-Ulzii Gonchig  
 Egiin Valley  
 On the move  
 Ulaanbaatar panorama  
 Little lamb-girl

## KEY ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ALAMGaC	Agency for Land Administration and Management, Geodesy and Cartography
ASSM	artisanal and small-scale mining
BR	biosphere reserve
CBD	Convention on Biological Diversity
CCPIU	Climate Change Project Implementation Unit
CHP	combined heat and power
CNDS	Comprehensive National Development Strategy
DLDD	desertification, land degradation and drought
DRM	disaster risk management
DRR	disaster risk reduction
EANET	Acid Deposition Monitoring Network in East Asia
EBRD	European Bank for Reconstruction and Development
EIA	environmental impact assessment
EIC	Environmental Information Centre
EITI	Extractive Industries Transparency Initiative
EMP	environmental management plan
ERC	Energy Regulatory Commission
ESCAP	Economic and Social Commission for Asia and the Pacific
ESD	education for sustainable development
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
GASI	General Agency for Specialized Inspection
GEF	Global Environment Facility
GHG	greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HCFC	hydrochlorofluorocarbon
HPP	hydropower plant
IBA	Important Bird Area
ILO	International Labour Organization
INDC	Intended Nationally Determined Contribution
IWRM	integrated water resources management
JICA	Japan International Cooperation Agency
LDN	land degradation neutrality
LMO	living modified organism
LPA	local protected area
LULUCF	land use, land-use change and forestry
MDG	Millennium Development Goal
MEA	multilateral environmental agreement
MNS	Mongolian National Standard
MoU	memorandum of understanding
MSW	municipal solid waste
NAMEM	National Agency for Meteorology and Environmental Monitoring
NAPCC	National Action Programme on Climate Change
NCD	non-communicable diseases
NDA	National Development Agency
NDC	Nationally Determined Contribution
NEMA	National Emergency Management Agency
NGO	non-governmental organization
NIP	National Implementation Plan
NM	national monument
NOA	National Ozone Authority
NP	national park
NR	nature reserve

NSO	National Statistics Office
NTFP	non-timber forest product
ODA	official development assistance
PAA	protected area administration
PAGE	Partnership for Action on Green Economy
PM	particulate matter
POP	persistent organic pollutant
PPP	public–private partnership
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SDV	Mongolia Sustainable Development Vision 2030
SEA	strategic environmental assessment
SME	small and medium-sized enterprise
SoER	state of the environment report
SPA	special protected area
StrPA	strictly protected area
UNCCD	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WWTP	wastewater treatment plant

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**SIGNS AND MEASURES**

..	not available
-	nil or negligible
.	decimal point
\$	dollar
cap	capita
eq	equivalent
g	gram
ha	hectare
kg	kilogram
km	kilometre
km <sup>2</sup>	square kilometre
km <sup>3</sup>	cubic kilometre
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m <sup>2</sup>	square metre
m <sup>3</sup>	cubic metre
mg	milligram
MW	megawatt
ppm	parts per million
t	ton (1,000 kg)

---

**CURRENCY CONVERSION TABLE**

Exchange rate (period average)  
Monetary unit 1 tugrik (MNT) = 100 möngö

<b>Year</b>	<b>NCU/US\$</b>
1997	789.99
1998	840.83
1999	1 021.87
2000	1 076.67
2001	1 097.70
2002	1 110.31
2003	1 146.54
2004	1 185.30
2005	1 205.25
2006	1 179.70
2007	1 170.40
2008	1 165.80
2009	1 437.80
2010	1 357.06
2011	1 265.52
2012	1 357.58
2013	1 523.93
2014	1 817.94
2015	1 970.31
2016	2 140.29

*Source:* ECE Statistical database. Accessed on August 2017.

*Note:* NCU: national currency unit

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## Executive summary

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### Polymaking, legal and institutional framework

*Mongolia is well on track with the work on implementation and monitoring of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs).* The Government has designed the 2016 Mongolia Sustainable Development Vision 2030 as a framework policy document for implementation of SDGs. It has assessed the availability of indicators. High ownership of SDGs among governmental officials is an important achievement. However, the institutional framework for coordination of SDG implementation and monitoring still needs to be operationalized.

*Green development is a clear policy objective, enshrined in the key national visionary document, the 2016 Mongolia Sustainable Development Vision 2030, as well as in the specific green-economy-oriented 2014 Green Development Policy.* A weak point of the planning system, especially from the environmental perspective, is the non-application of the strategic environmental assessment (SEA) tool for evaluation of environmental impacts of future sectoral policies.

*Since 1987, Mongolia has developed an extensive legal framework on environmental protection.* The environmental legislation is largely consistent and coherent. However, implementation of environmental legislation is often delayed. Furthermore, enforcement of environmental laws and environment-related provisions in sectoral legislation often represents a serious challenge.

*In recent years, the Government made efforts to integrate environmental requirements into the legal and policy framework on mining.* Nevertheless, there are still a number of deficiencies. The environmental impact assessment (EIA) is conducted late in the permitting process. The mandatory agreements between mining companies and local authorities in order to protect the environment are not publicly disclosed. Implementation of legislation on the restoration of land affected by mining represents a huge challenge.

*The current policy documents related to mining focus on establishing a favourable investment environment for the mining sector.* Their environmental focus is less pronounced. There is no policy document that specifically addresses the abandoned and damaged mining areas and their rehabilitation. Similarly, there is no policy document that targets the creation of opportunities for artisanal miners to switch to other areas of employment.

*One of the key issues for the Ministry of Environment and Tourism is staff turnover.* High staff turnover impedes the consistent development and implementation of policies on the environment and green development and destabilizes the institutional memory of the organization.

*The establishment of the General Agency for Specialized Inspection (GASI) under the Prime Minister in 2003 has allowed the separation of policymaking and the regulatory function from the control and enforcement function.* Positive outcomes include more efficient use of resources and strengthening of the links between thematic inspectors. However, the insufficient level of cooperation between GASI and the Ministry of Environment and Tourism is a weak link in the new system. The dependency of soum environmental inspectors on soum governors is another drawback.

### Regulatory and compliance assurance mechanisms

*The permitting and licensing system is continuing to evolve, incorporating additional environmental media and additional pollutant sources and environmentally-damaging activities.* However, some implementing regulations are absent or incomplete, leading to some gaps in permitting, notably regarding air emissions and wastewater discharges.

*The EIA procedures are comprehensive and Mongolia has accumulated extensive experience with the use of the EIA instrument.* Still, EIA in practice is undermined by poor implementation by licensed entities and ineffective oversight. Public confidence in the EIA system is low. A cumulative impact assessment procedure is envisaged by the legislation, but its practical application has been limited.

*The revised 2012 Law on Environmental Impact Assessment provides for biodiversity offsetting.* Opinions about how biodiversity offsetting and alternative land rehabilitation actually work differ among governmental officials and international and local non-governmental organizations (NGOs) and activists. Guidelines for biodiversity offsetting and rehabilitation of alternative land are insufficient.

*The introduction of environmental audit in 2012–2013 was an important addition to the environmental management framework.* Practical implementation of environmental audit has been rather slow and experience is limited to date. The audit practice is being driven by voluntary commitments or investor pressure, not by the legislation.

*The Government's commitment to the Extractive Industries Transparency Initiative (EITI) is central for progress in encouraging companies to adopt sustainable practices and integrate sustainability information into their reporting cycles in line with SDG Target 12.6.* EITI Mongolia offers a structure for transparency that could give foreign investors confidence in the fairness of licensing. However, there are important gaps in the data provided to EITI Mongolia by the authorities.

*The adoption of environmental management systems has progressed lately, but so far very few companies have been certified in accordance with MNS ISO 14001.* Current efforts by the Government to promote the standard are not sufficient. No systematic effort is applied to promote resource efficiency and cleaner production among the business community.

## Greening the economy

*The greening of economic growth is a key goal of the national development policies. Sectoral policies are being revised in line with the 2014 Green Development Policy and 2016 Mongolia Sustainable Development Vision 2030.* However, the overall costs of achieving the related numerous targets and measures have not been estimated.

*Financing of environmental expenditures and related national programmes relies largely on annual state budget allocations and foreign loans and grants.* Resources allocated to the Environment and Climate Change Fund for the financing of national environment-related programmes have remained quite small. Local governments can rely on their own earmarked revenues for financing environmental expenditures, but the actual expenditures have fallen increasingly short of the mandatory funds that they should spend.

*Another challenge is to develop statistics for the measurement of green growth indicators, which are designed inter alia for gauging the extent to which economic growth has been decoupled from environmental degradation (SDG Target 8.4).* First steps in this direction have been made with the approval by the National Statistics Office (NSO) in July 2017 of 38 green development indicators.

*The role of economic instruments in creating effective incentives for changes in the behaviour of polluters has remained modest.* The tax rates applied to the four components of the air pollution tax are too low for achieving this. The water pollution tax has been awaiting the adoption of secondary legislation required for its implementation. The excise duty on motor fuels has not been used as an instrument for more rational use of petrol and diesel.

*Tariffs for water supply and energy do not provide sufficient incentives for rational use of these resources.* Insufficient tariffs for recovering costs are also a barrier for greater private sector involvement in the provision of these services.

*Mongolia has developed and applied methodologies for assessing the monetary value of natural resources, which are used as benchmarks for the calculation of environmental damage compensation.* However, the ways and means of establishing the asset values are not fully transparent and therefore difficult to appreciate. The same holds for the fees imposed on the use of the numerous specific types of natural resources, which are set at the local government level.

*Mining companies are obliged to build up financial reserves to ensure adequate rehabilitation/reclamation of mining sites after their closure.* However, there are concerns about whether these funds are sufficient for financing the required works in such a way that they meet the existing international best practice in the mining sector.

*Mongolia has a huge potential in terms of solar and wind energy production. Interest in the sector is growing, reflected also in inflows of foreign direct investment (FDI).* However, the exploitation of the huge potential for renewable energy remains a major challenge despite a generous system of feed-in tariffs designed to provide financial incentives for the development of the renewable energy sector and the recently-introduced system of support tariffs.

### **Environmental monitoring and information**

*The environmental monitoring network covers the core environmental themes.* However, it requires strengthening and some indicators are also lacking in the collection and reporting. In particular, there is no noise and vibration monitoring. The last nationwide assessment of species of different biomes was carried out in 2010, and was not repeated in 2014, due to the budgetary shortages. The laboratories of the National Agency for Meteorology and Environmental Monitoring (NAMEM) lack capacity; some laboratories at aimag (provincial) level lack accreditation for key parameters.

*Self-monitoring is required by the legislation.* In reality, larger companies have dedicated units and the quality of self-monitoring reports is better, but small and medium-sized enterprises (SMEs) struggle.

*The Ministry of Environment and Tourism issues a national state of the environment report (SoER) every two years.* The reports are indicator based, but not based on the Driver, Pressure, State, Impact, Response (DPSIR) framework. They do not contain a non-technical summary.

*The Ministry of Environment and Tourism and the National Statistics Office (NSO) cooperate to produce official environmental statistics.* However, the two institutions lack experience and capacity to produce good quality environmental statistics, which is a prerequisite for the production of high quality environmental reports, implementation of the System of Environmental-Economic Accounting and the production of indicators in the follow-up and review of the 2030 Agenda for Sustainable Development.

### **Access to information, public participation and education**

*The legislative framework regulating access to environmental information is in place and evolving.* Nevertheless, adequate implementation by both the Government and the public remains a challenge. The current practice and procedures in governmental institutions other than the Ministry of Environment and Tourism in providing environmental information to the public are rather fragmented. Another concern is the scarce online availability of information on the state of the environment, including raw and aggregated data and metadata.

*The Environmental Information Centre (EIC), managed by the Information and Research Institute of Meteorology, Hydrology and Environment under NAMEM, is a powerful tool for the sharing of information with the public.* However, that information is incomplete and available data are often contradictory.

*Mongolia is progressing towards developing the legal framework for public participation in environmental decision-making and implementing it in practice.* However, numerous challenges remain to ensure effective public participation. These include insufficient time for public consultations on planned projects and for public comments on the drafts of laws and secondary legislation, and the lack of capacity and knowledge among local authorities and businesses on how to engage the public in consultations.

*There are 487 registered environmental NGOs, though, according to the Ministry of Environment and Tourism, only about 100 environmental NGOs are active.* There are a number of environmental NGO coalitions and movements. Organizing themselves in coalitions and movements helps NGOs conduct activities in a more targeted and efficient manner.

*Cases of harassment and pressure against environmental activists for their environmental activities still occur.* It is not clear what actions are being taken by the Government to prevent such cases from occurring and to ensure proper investigation and avoid suspicion of covering up.



*Access to the courts for members of the public and NGOs is limited by the resources, skills and knowledge available to them.* The overall financial costs for filing and pursuing cases in the courts are too high to allow the public fair access to justice in environmental matters. Judges do not receive training on environmental matters.

*The process of integration of education for sustainable development (ESD) into curricula has intensified in recent years, since ESD was integrated into the curricula of general secondary education.* Implementation of the new curricula in all schools across the country is now important, along with the efforts to further expand the integration of ESD at various education levels. Numerous activities are implemented as part of informal and non-formal education on the environment and sustainable development.

*The biggest challenge is the provision of necessary financial resources from the state budget in order to ensure the training of teachers and build capacity on ESD of relevant governmental officials.* The Government's continuous commitment to and provision of adequate support to integrate ESD into formal and non-formal education are prerequisites to the successful development of ESD and the achievement of SDG Targets 4.7 and 12.8.

### **Implementation of international agreements and commitments**

*International, regional and bilateral cooperation is at the heart of environmental policy in Mongolia.* The country committedly follows the international community's progress on sustainable development, the environment and green development. With the approval of the Mongolia Sustainable Development Vision 2030 in 2016, the country became one of the global early adopters of the SDGs.

*Mongolia is party to nearly all relevant global multilateral environmental agreements (MEAs).* It has rapidly ratified the most recent MEAs, such as the Minamata Convention on Mercury. Nonetheless, a few gaps remain, and ratifying further MEAs would support the country in achieving a more comprehensive framework for the protection of the environment.

*Implementation and compliance with international obligations remain a challenge.* This is due in part to insufficient human resources and capacity and financial resources in the Ministry of Environment and Tourism.

*The country has complied with its international reporting obligations.* Some exceptions occurred in reporting under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention).

*Mongolia has been supported by an increasing number of bilateral and multilateral donors.* This shows the country's capacity to establish diverse strategic partnerships. Nevertheless, Mongolia is highly dependent on the international donor community in respect of technical expertise and financial resources.

*From the early 1990s, the country has advanced considerably in wetland classification, designation of Ramsar sites, management and public awareness activities.* Some protected areas were expanded to cover areas within Ramsar sites. However, not all designated Ramsar sites have management plans. The priorities also include conducting status assessments for Ramsar sites and improving Ramsar site monitoring activities.

*Mongolia has been making constant efforts to protect specific species, driven by its obligations under CITES and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).* Several programmes were adopted to protect specific species, such as red deer, argali, snow leopard, Saker falcon, musk deer and Gobi bear. However, there is insufficient reliable and systematic information on the results of these programmes. Monitoring and law enforcement remain significant challenges.

*The country has progressed notably in the 20 years of implementation of the international agreements related to the ozone layer.* The Government reported the consumption of 0.64 Ozone Depleting Potential (ODP) tons of hydrochlorofluorocarbons (HCFCs) in 2015, which is 54 per cent below the country's baseline. Mongolia therefore fulfilled the 10 per cent reduction in HCFC consumption in 2015 foreseen in the Montreal Protocol schedule.

## Implementation of Rio Conventions

*Although no specific mechanism or structure exists to promote synergies between the implementation of the Rio Conventions, the main policy frameworks in the three domains directly or indirectly contribute to the coordinated implementation of the three Conventions.* Institutional, technical and financial capacities remain the main challenges for the implementation of all three Conventions, though to differing degrees.

*Mongolia has more than 20 years' experience of strategic planning on biodiversity, which has resulted in a vast but somewhat dispersed set of legislation and policy documents relevant for the implementation of the 1992 Convention on Biological Diversity (CBD).* The main benefits lie in the steady evolution of the designation of state specially protected areas. Challenges affecting CBD implementation are associated with pressure on ecosystems related to cross-sectoral issues such as climate change, desertification, habitat degradation due to unsustainable agricultural practices and pollution due to the growth of mining operations near river beds.

*The legal and institutional framework for implementation of the 2000 Cartagena Protocol on Biosafety is generally adequate.* Challenges persist in terms of having the capacity to perform risk assessments and monitoring activities regarding living modified organisms (LMOs). No national database for registering LMOs and derived products exists. Legislation is in need of revision in order to comply with the 2010 Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress.

*Mongolia has an interest in rapidly starting implementation of the 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, in order to prevent the continuation of genetic resources leaving the country.* However, in addition to building an adequate legal framework, the main challenges for implementation lie in the funding required, capacity development and the operationalization of an effective institutional framework.

*Being a party to the 1994 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD), Mongolia implements its National Action Programme to Combat Desertification 2010–2020 aligned with the 10-year Strategy of UNCCD.* Having an adequate strategic framework has facilitated access to international organizations and donor countries that support the implementation of technical assistance projects. A land degradation monitoring network was established.

*Greenhouse gas (GHG) emissions amounted to 34,530 Gg CO<sub>2</sub> eq in 2014, representing an increase of 57.07 per cent since 1990.* The largest contributors are the energy sector (50 per cent of total emissions in 2014) and the agriculture sector (48.44 per cent). In 2014, Mongolia was in fifty-fourth position in the global ranking of CO<sub>2</sub> emissions per capita, with 7.12 t CO<sub>2</sub> emissions per capita.

*Mongolia has done a comprehensive and thorough strategic planning and needs assessment on climate change, which is a direct benefit of being a party to the 1992 United Nations Framework Convention on Climate Change (UNFCCC).* The country today has time series of up to 25 years of climate-relevant data, though some challenges persist in terms of data availability and GHG inventory. Mongolia has benefited extensively from technical and financial support through the Clean Development Mechanism (CDM), the Joint Crediting Mechanism and the Green Climate Fund.

*The 2015 Nationally Determined Contribution (NDC) of Mongolia includes the target to reach an annual reduction of 7,300 t CO<sub>2</sub> eq of emissions in 2030, corresponding to a 14 per cent reduction compared with a business-as-usual (BAU) scenario, excluding Land Use, Land-Use Change and Forestry (LULUCF).* However, implementation of the measures foreseen is not yet decided. Furthermore, although adaptation components have been included in the main strategic documents on climate change, no strategy or national adaptation plan has been approved to date. Preparation of such a plan is an important element for achievement of SDG Target 13.2.

## Air protection

*Although the air quality monitoring network of 40 monitoring sites seems robust, only 11 sites are automated.* There is no regular monitoring or self-monitoring of emissions of major pollutants, and insufficient air quality

monitoring in ger districts. Also, there are no available data on air emissions on the national level. Government policies are more focused on the capital city, while bad air quality in other regions is insufficiently addressed.

*Particulate matter (PM) is considered the main pollutant in Mongolia, especially in Ulaanbaatar.* However, there is limited scientific knowledge on its content and source.

*The dust storms from the Gobi Desert (predominantly yellow sand) contribute substantially to sporadic PM pollution peaks.* However, regular assessment of air quality does not take into account the contribution of sand and dust, especially to PM<sub>10</sub>.

*The Government has implemented numerous projects in ger districts, providing clean fuel and improved heating stoves, as high concentrations of suspended particles are commonly blamed on the use of raw coal for domestic heating in ger districts.* Annual concentrations of PM<sub>10</sub> in Ulaanbaatar show a certain decline but, due to inconsistent measurements and lack of data analysis, the results of actions taken are difficult to estimate.

*The revised 2012 Law on Air requires major stationary sources to install equipment to monitor air emissions and abatement equipment.* However, emissions from power plants are not monitored regularly and there is no national emission standard specifically for large combustion plants. The Law also prescribes fines for violating emission standards. However, the fines are too low to serve as an incentive to install abatement equipment.

*According to the 2010 Law on Air Pollution Fees, fines for major sources that exceed emission standards should be calculated based on the estimated value of the damage.* The most significant environmental damage caused by air pollution is damage to human health. However, there is no precise methodology for the estimation of population exposure and calculation of the economic cost of the health impact of air pollution. This also leaves Mongolia less prepared to substantially reduce the number of deaths and illnesses from air pollution in line with SDG Target 3.9.

*The Mongolian standard MNS 4585:2016 for the Air Quality Index prescribes the method for calculation of such an index.* The prescribed methodology makes the Air Quality Index misleading, as, in most of the cases, the values of the Index would correspond to the real PM<sub>10</sub> concentrations.

## Water management

*The Government established the priorities for water management in the 2010 National Water Programme and 2016 Mongolia Sustainable Development Vision 2030.* Much attention is paid to revising and extending the legislative and regulatory frameworks. Achievements include the prohibition of mineral exploration and exploitation in run-off source areas, introduced in 2009, and placing 44.5 per cent of the total area of river sources under national protection by 2016.

*The integrated water resources management (IWRM) approach is a priority direction for reforming the water management system.* Practical implementation of IWRM lags behind, with the need to develop IWRM plans for the remaining basins, ensure implementation of IWRM plans and advance opportunities for public participation in water management.

*Mongolia established 21 water basin administrations for its 29 water basins.* However, these bodies lack the experience needed for implementation of their tasks. Training and professional development of employees of the water basin authorities are of the utmost importance, to enable them to implement the assigned tasks and be better positioned for advancing implementation of Target 6.5 of the 2030 Agenda for Sustainable Development.

*About 95 per cent of the water used in the country is supplied from groundwater resources, which amount to only 1.91 per cent of the total volume of Mongolia's water resources.* Surface water resources are unequally distributed throughout the territory and are used to a limited extent.

*The official data for access to water supply and sanitation and the related MDG indicators vary between different sources.* The clear gaps are the persistent differences in access to both water supply and sanitation between urban and rural areas, the limited number of households connected to central sewerage systems in urban areas and the very low percentage of the rural population (according to some sources, less than 5 per cent in 2010) estimated

to have access to adequate sanitation. Open defecation is still practised. Additional efforts are therefore needed for the country to achieve Targets 6.1 and 6.2 of the 2030 Agenda for Sustainable Development.

*Treated wastewater increased from 60 million m<sup>3</sup> (30 per cent) in 2012 to almost 88 million m<sup>3</sup> (44 per cent) in 2016.* Untreated wastewater is dumped into the environment, causing surface water and groundwater contamination. The lack of financial resources causes delays in repair, maintenance, restoration and reconstruction of wastewater treatment plants (WWTPs). This is especially true for WWTPs in rural areas and in remote locations.

## Waste management

*Although waste data have been collected for more than a decade, their quality is low.* A list of hazardous waste was adopted, but it is not used in practice. Other waste-management-related data exist but are not aggregated at the national level. The lack of waste management data impedes the development of projects and provision of information to public.

*The priority in waste management during the last decade was the improvement of municipal solid waste (MSW) management and healthcare waste management.* Sectoral strategies or sectoral waste management plans are not in place. Radioactive waste is not considered an immediate priority.

*Regular MSW collection services are concentrated in urban areas.* The overall waste collection coverage is assumed to be 70 per cent in urban and 40 per cent in rural areas. Waste collection coverage in Ulaanbaatar is estimated at 90–95 per cent.

*MSW is disposed of in dumpsites, which are located near residential areas.* These sites were created ad hoc, and only later did municipal authorities start to declare official disposal sites. There are about 400 official disposal sites covering territory of 3,500–4,500 ha. The number of illegal dumpsites is hard to estimate but, during the period 2006–2016, more than 4,000 illegal sites covering 500,000 ha were cleaned and 1.1 million tons of illegally disposed waste were transferred to official disposal sites.

*Recycling is focused on high-value wastes such as metals, plastics, paper and cardboard. Separation of recyclables from municipal waste is well developed with a system of buy-out points.* However, most recyclables are exported because recycling capacities are lacking in Mongolia. A complex waste management facility, EcoPark, is planned to enhance waste recycling capacities.

*Information on hazardous waste is limited. It is estimated that about 27,000–54,000 t of hazardous waste is generated annually throughout the country.* The main sources of hazardous waste are sludge from tanneries, waste from processing and use of crude oil, and soil containing cyanide and mercury from gold ore processing. Additionally, there are banned chemicals and acids from the recycling of car batteries. Improved reporting mechanisms on hazardous waste are needed for Mongolia to be able to measure progress towards achieving SDG Target 12.4.

*Information on the environmental impact of artisanal mining activities is limited.* The 2007 SoER identified 120 illegal gold extraction sites. These illegal activities generated 203,500 m<sup>3</sup> of tailings and 53.5 ha of land contaminated by mercury.

## Biodiversity and protected areas

*Mongolia has managed to preserve its pristine natural ecosystems and is still one of the last wildlife species refuges of East Asia.* However, throughout the last three decades, Mongolia has experienced rapid declines of numerous species, including those globally threatened by extinction. Simultaneously, the integrity of almost all natural ecosystems in each of the four ecoregions of Mongolia is currently threatened, mostly due to growing anthropogenic pressures.

*Since the beginning of the 1990s, Mongolia has developed a complex system of protected areas, designated at different administrative levels and covering almost 47 million ha, or 29.91 per cent of the country's territory, in 2017.* However, a considerable part of wildlife habitats and migration corridors of wide-ranging and globally

significant species remain in the "non-protected" 70 per cent of the country. Moreover, in the case of some protected areas, the current zoning pattern does not provide the sufficient protection level for important wildlife habitats. Addressing these challenges is important for Mongolia's progress in achieving SDG Targets 15.1 and 15.4.

*Management planning is not adequately regulated by the current legislation, and remains a weak point of the system.* The management responsibility pattern is complicated, as strictly protected areas (StrPAs) and national parks (NPs) are either directly managed by the State or by contracted NGOs and herder group associations, while State-designated nature reserves (NRs) and natural monuments (NMs), as well as all locally-designated buffer zones and local protected areas (LPAs), are managed by the regional and local authorities. Even though there is no legal requirement for developing management plans for special protected areas (SPAs), the Ministry of Environment and Tourism expects all state SPAs to have management plans and this process is ongoing.

*Budgetary constraints are common in State-funded protected area administrations (PAAs), which cannot retain and use revenues from entrance fees.* There is no legal requirement for land fees to be allocated for the maintenance and management of protected areas.

*The current human, technical, operational and financial capacities are not sufficient, given the tasks determined by the current policy framework on biodiversity.* Seven officers of the Protected Areas Management Department of the Ministry of Environment and Tourism being responsible for effective management of the state SPA system, or 337 rangers being responsible for surveillance and law enforcement over the territory of 24 million ha, are clearly not enough. Without enhancement of the current capacities, the implementation of state policies related to biodiversity and protected areas, as well as the related achievement of SDG Targets 15.1, 15.4 and 15.5, might simply not be feasible.

*Due to a considerable number of gaps and shortcomings, the 1994 Law on Special Protected Areas is currently under revision.* In addition, a new programme on SPAs is to be developed in place of the 1998 National Programme on Special Protected Areas. The new programme is to address the planned expansion of the state network of protected areas and improve the management of protected areas.

## Land management

*In 2015, around 76.8 per cent of the total territory was degraded to some degree, with 24.1 per cent slightly degraded, 29.8 per cent moderately degraded, 16.8 per cent severely degraded and 6.1 per cent very severely degraded.* The severely and very severely affected areas include dry and semi-desert lands of the Lake Uvs Basin, the Great Lakes Depression, and Dundgobi and Dornogobi Aimags.

*Most land degradation occurs on rangeland. The area of rangeland had decreased from 123.6 million ha in 1987 to 112.2 million ha in 2016. Meanwhile, the livestock population had increased by 2.7 times, from 22.741 million head in 1987 to 61.549 million head in 2016.* Consequently, the density of livestock increased from 18 head per hundred ha in 1987 to 54 head per hundred ha in 2016, putting increased pressure on the rangeland. Along with the increase in the livestock population, the composition of livestock had changed: the share of goats has increased from 19.3 per cent in 1987 to 42.1 per cent in 2015. At the end of 2015, about 63 per cent of rangeland was severely overgrazed.

*Apart from overgrazing, the pressures on rangeland from human activities include mining, unpaved multitrack roads and urbanization.* Notwithstanding this pressure, Mongolia lacks a law for regulating the use of rangeland; it has remained in a draft version for a number of years.

*The Government has set ambitious targets to restore not less than 70 per cent of degraded land and decrease the area of desertified land to 60 per cent of total territory by 2030, in line with SDG Target 15.3.* It has advanced the legal and policymaking framework through the adoption of the 2012 Law on Soil Protection and Desertification Prevention and the 2010 National Action Programme to Combat Desertification, covering the period 2010–2020. However, practical implementation of the envisaged policies faces challenges in view of limited financial resources and the inadequate level of institutional coordination.

*Mongolia's network for monitoring land degradation and desertification consists of 1,500 points throughout the country.* The information on three land degradation neutrality (LDN) indicators (i.e. land cover and land cover change, land productivity, and carbon stocks above and below ground) is currently not collected.

### **Forestry and environment**

*About 18.45 million ha are considered forest land as of 2016, representing 11.8 per cent of the country's total area. Of this, only 12.28 million ha, or 7.85 per cent of the country's territory, are actually covered by forests.* Unstocked forest area (5.63 million ha) refers to areas that have been deforested due to various disturbances, such as forestry and/or non-forestry operations, overgrazing, overexploitation for fuelwood and timber, repeated fires and attacks by insects and diseases. The 2016 Mongolia Sustainable Development Vision 2030 sets the target of increasing the area of forest cover to 9 per cent of the country's total territory by 2030.

*The Multi-Purpose National Forest Inventory (2014–2016) has shown that the major part of the Mongolian boreal forest is overmature, with 74.07 per cent of forest stands classified as mature or overmature.* Consequently, forests are not only less productive but also more prone to fires and pest attacks and less resilient to climate change. The result is forest degradation and, ultimately, deforestation. More active forest management of mature and overmature stands, which would not only improve the overall forest condition but also create jobs and income in rural areas, is lacking.

*There are no recent data available on the percentage of the forest fund that is inside the SPAs.* According to the Multi-Purpose National Forest Inventory and ECE estimates for saxaul forests, to date, 3.1 million ha of the forest area, including both boreal and saxaul forests, are located inside SPAs, which corresponds to close to 25 per cent of the total forest area covered by forests but only 1.98 per cent of the country's territory.

*Most of the government funding in the forestry sector is allocated for tree planting (reforestation and afforestation) and pest control.* However, the success and survival rate of the reforestation and afforestation practices are not carefully evaluated and reflected in long-term policy. The funding currently provided to the forestry sector is not sufficient to support more effective forest management with consideration of the potential of forestry to support rural livelihoods.

*The natural forests are in great need of tending and thinning to ensure healthy forest stands, increased growth and resilience to climate change.* However, there is no concept on the rational use of residues from forest thinning and tending activities.

*Mongolia made significant progress towards developing participatory forest management.* The creation of forest user groups has been effective in preventing illegal logging in forests managed by such groups. However, forest user groups are still not regarded as key players in the sustainable management of the country's forests. The legal status of forest user groups is still unclear. They do not have access to financial services. There is no information on the extent to which the management of forests by forest user groups has impacted on deforestation and forest degradation, management of non-timber forest products (NTFPs), wildlife and plant resources, and enhancing carbon sequestration.

### **Risk management of natural and technological/anthropogenic hazards**

*The number, occurrence, frequency, severity and impact of natural and technological or anthropogenic hazards in Mongolia increased in the period 2000–2016.* The average economic loss caused from natural and technological hazards in the period amounted to 76.0 billion tugriks per year. In particular, in 2010, the economic losses of 534,796 million tugriks amounted to 5.5 per cent of GDP, at 2010 constant prices.

*Since the 1990s, Mongolia has been experiencing rapid rural-to-urban migration and urbanization, which has largely been unplanned and has resulted in many development challenges, including lack of access to basic services and high levels of air pollution during winter in some areas.* Ger districts at the city outskirts are often situated in flood pathways. Addressing these challenges is crucial for achieving progress towards SDG Targets 1.5, 11.5 and 11.b.

*Government officials are well aware of the importance and interdependence of the Sendai Framework for Disaster Risk Reduction (DRR) 2015–2030, the Paris Agreement on Climate Change and the 2030 Agenda for Sustainable Development, which are seen as the drivers of the national development agenda.* There is a good understanding of the interdependence of work on disaster risk management (DRM), climate change adaptation and sustainable development, but practical implementation of these linkages and institutional coordination encounter difficulties.

*There are multiple challenges faced by the DRM system as far as preparedness, response and recovery planning are concerned.* Emergency preparedness and response capacities are more developed at the national level. At the local level, international organizations and NGOs support government efforts and provide technical assistance with emergency response services. Effective coordination of the activities at the national and local levels to optimize the use of available funds and resources is among recurrent challenges.

*The majority of institutions and professionals, at all levels of administration (from central to local), have a good understanding of disaster and climate risks.* Various technical institutions are formally mandated for data collection and forecasting. However, only in a few sectors has risk assessment eventually been conducted.

*Three cities (Darkhan, Erdenet and Ulaanbaatar) have officially joined the global campaign "Making Cities Resilient: My City is Getting Ready".* This means that they have integrated DRR into local development policy and urban action plans and work to ensure effective implementation. There is no information on other local governments that have adopted and implemented local DRR strategies.

## **Health, food safety and environment**

*During the last two decades, the health status of the population improved.* However, great differences in health indicators are observed between regions and aimags (provinces). Since 2000, the lowest life expectancy values are observed in Dornod Aimag (58 years in 2000, 63.9 years in 2010 and 68.63 years in 2016) and Khuvsgul Aimag (59 years in 2000, 63.6 years in 2010 and 66 years in 2016).

*In recent years, both ambient and indoor air pollution have become among the most pressing environmental health problems.* The annual PM<sub>2.5</sub> air pollution concentration (average nearly 70 µg/m<sup>3</sup>) in Ulaanbaatar is higher than the Mongolian Air Quality Standard (25 µg/m<sup>3</sup>) and the WHO Air Quality Guidelines (10 µg/m<sup>3</sup>). In 2016, a UNICEF-funded assessment of hygienic and sanitary conditions and indoor air quality in schools showed that the average CO<sub>2</sub> concentration in the sampled schools was 1.6–1.8 times higher than the approved standard. The same study indicated that the PM<sub>2.5</sub> concentration was 3.1–10.05 times higher in sampled schools than the national standard on air quality.

*The 2017 National Environmental Health Programme designed for the period 2017–2020 prioritizes work to reduce health impacts from air, water and soil pollution, and from chemicals.* Several other environmental-health-related programmes exist, but their implementation at aimag and local level and their final assessment are not available. The priorities and the overarching strategy in environmental health are not defined. There is a lack of thematic action plans such as action plans on asbestos, indoor air quality and environmental noise.

*Knowledge on the impact of environmental factors on population health is limited to specific media, such as air pollution, but the impacts on health of asbestos, noise, chemicals and anthropogenic activities are not documented.* Databases on dangerous substances (chemicals, hazardous waste, asbestos, lead, radon) and on their emission and locations are not established. Consequently, exposure of the population to these contaminants and their impact on health are not defined and it is difficult to prevent population exposure.

*Asbestos is still in use.* There are no standards for asbestos exposure and no policy for detection of asbestos in buildings before demolition. Asbestos exposure and related diseases are not monitored or registered.

*Mining activities have increased during the last two decades, which has had an impact on the environment and on the health of the workers, the population and livestock.* The population in mining areas is subject to the cumulative impact of mining activities on air, soil, water, animals (livestock) and, consequently, their health. Health hazards related to mining include dust-related respiratory diseases and chemical poisoning.

*The country is committed to ending the use of mercury in medical materials.* The Mercury-free Hospital Initiative was successfully rolled out. In 2012, 14 hospitals were announced to be mercury free.

*Access to good quality, safe water in schools and kindergartens is an issue, especially in remote areas.* Several local actions are performed by national and international organizations to ameliorate this situation, but they are not replicated across the country.





# INTRODUCTION

## 1.1 The physical context

Mongolia is a landlocked country in East Asia located between China to the south (border length 4,677 km) and the Russian Federation to the north (border 3,543 km). The country has a total area of 1,564,116 km<sup>2</sup>, of which 10,560 km<sup>2</sup> are covered by water.

The whole land area of the country is part of the Mongolian Plateau. The geography is very varied, with mountainous regions to the north and west and the Gobi Desert to the south. The main topographic feature is the general land inclination from the high mountains located in the west and the north of the country towards the plains and depressions in the east and the south. From north to south, the country can be divided into four general natural zones: mountain-forest steppe, mountain steppe and, in the extreme south, semi-desert and desert. These can further be divided into seven more distinct natural zones. The average elevation of the country is 1,580 m and the lowest point, at 518 m, is located in the eastern Mongolian plain.

The country has two major mountain ranges. The higher of them, the Altai Mountains, stretches from the north-west to the south-east across the western and south-western regions of the country. The highest point of Mongolia, the 4,374 m, permanently snowcapped, Khüiten Peak, is part of the Tavan Bogd peaks of the Altai Mountains range and located almost at the western tip of the country on the junction of the border with China and the Russian Federation. There is a marked glaciation in the Tavan Bogd area where Potanin Glacier stretches for 11 km.

The Khangai Mountains, also extending from the north-west to the south-east, occupy much of central and north-central Mongolia. These are older, lower and more eroded mountains, covered with forests and alpine pastures. The 4,008 m Olgontenger Mountain, which is the highest peak of the Khangai Mountains, is one of the sacred mountains of Mongolia. Mountainous northern and western Mongolia are seismically active zones, with frequent earthquakes and many hot springs and extinct volcanoes.

Most of Mongolia is grassland steppe, with 7.85 per cent of the total land area covered by forest in 2016. There is very little arable land – less than 1 per cent of the land area – while the rest is rangeland or desert. Grain, mostly wheat, is grown in the valleys of the Selenge River system in the north, but yields fluctuate

widely and unpredictably as a result of the amount and the timing of rain and the occurrence of dzuds.

The name "gobi" is a Mongolian language word meaning desert, depression, salt marsh or steppe, but it is used to refer to an arid rangeland with insufficient vegetation to support marmots but enough vegetation to support camels. The local population makes a distinction between a gobi and a desert proper, though the difference is not always apparent to outsiders unfamiliar with the Mongolian landscape. Gobi rangelands are very fragile and can be destroyed by overgrazing, which results in expansion of the true desert, a stony waste where not even Bactrian camels can survive.

The lakes are unevenly distributed and many of them, including some of the largest, can be found in the Great Lakes Depression between the Altai, Khangai and Tagnyn Nuruu mountain ranges in the west. Although the area under water is small – only 0.67 per cent of the country's territory – Mongolia still has one of Asia's largest freshwater lakes, Lake Khövsgöl, which is located in a rift valley south of the Sayan Mountains and has the largest water volume of all Mongolian lakes because of its great depth, holding 70 per cent of the total freshwater of the country. Mongolia's largest lake by area, Lake Uvs, is located in the Great Lakes Depression. The remaining lakes found in mountain valleys, in the steppe areas or in the Gobi Desert are usually smaller and shallow.

Rivers are located in the north of the country. The major river system is the Selenge River, which drains via Lake Baikal to the Arctic Ocean. Some minor tributaries of Siberia's mighty Yenisei River, which also flows to the Arctic Ocean, rise in the mountains of north-western Mongolia. In north-eastern Mongolia, Onon River drains into the Pacific Ocean through the Shilka River in the Russian Federation and then Amur (Heilong Jiang) River, forming the 10th-longest river system in the world. Many rivers of western Mongolia drain into lakes in the Central Asian Internal Drainage Basin. The few streams in southern Mongolia do not drain into the sea but run into lakes or deserts.

Mongolia has an extreme continental climate with long, cold winters and short summers. The country has 257 cloudless days a year on average, and it is usually at the centre of a high atmospheric pressure region. Most of the precipitation falls during the summer and is highest in the north, which receives on average 200–

350 mm of precipitation per year, and lowest in the south, which receives 100–200 mm, while some regions of the Gobi Desert in the south receive no precipitation at all in most years.

Mongolia's weather is characterized by extreme variability and short-term unpredictability in the summer, and the multiyear averages conceal wide variations in precipitation, dates of frosts and occurrences of blizzards and spring dust storms. Weather like this causes a severe challenge to human and livestock survival. About one-third of Mongolia's population depends entirely on pastoral farming and their livelihood is affected by the dzud – a natural disaster unique to Mongolia, which can cause economic crises and even lack of food security. A dzud (Mongolian: зуд) is a term for a severe winter in which large numbers of livestock die, primarily due to starvation because they are unable to graze, or in some cases directly from the cold. There are various kinds of dzud, including white dzud, which is an extremely snowy winter in which livestock are unable to find nourishing foodstuffs through the snow cover and

starve (chapter 14).

Most of Mongolia is covered by discontinuous permafrost (grading to continuous at high altitudes), which makes construction, road building and mining difficult. All rivers and freshwater lakes freeze over in the winter, and smaller streams commonly freeze to the bottom.

Average temperatures over most of the country are below freezing from November through March and are around freezing point in October and April. The night temperatures in winter can drop to  $-40^{\circ}\text{C}$  in most years while the summer extremes can reach as high as  $38^{\circ}\text{C}$  in the southern Gobi region and  $33^{\circ}\text{C}$  in the capital, Ulaanbaatar.

Ulaanbaatar is located at 1,351 m above sea level in the relatively well-watered north, and receives an annual average of 310 mm of precipitation, almost all of which falls in July and August. Ulaanbaatar has an annual average temperature of  $-2.9^{\circ}\text{C}$  and a frost-free period from mid-May to late August, on average.

**Photo I: Horses drinking, Orkhon Valley**



## I.2 Demographic and socioeconomic context

### *Population*

In 2016, Mongolia had 3.120 million inhabitants. With a population density of 1.99 inhabitants per km<sup>2</sup>, Mongolia is the world's most sparsely populated country. However, over the past 15 years, since 2002, Mongolia has had a 20.97 per cent increase in its total population. During the same period, the urban population share has grown from 58.30 per cent to 68.33 per cent of the total population, or from 1.437 million to 2.131 million people.

The largest city of the country is Ulaanbaatar, which has a population of about 1.44 million people or about 46 per cent of the total population of the country in 2016. Ulaanbaatar is the country's cultural, industrial and financial centre. It is also a transportation hub because it is located at the centre of the country's road network and connected by rail to both the Russian Trans-Siberian Railway and the Chinese railway system.

The total fertility rate has been on the rise since 2002 and the latest figure (for 2016) was a relatively high 3.0, which is much higher than the European Union (EU)'s 1.58, or 1.6 in the neighbouring Russian Federation or China. The birth rate, which had been increasing from 2006 onwards, reached its peak of 28 (per 1,000) in 2014 but has since then decreased somewhat to 25.9 in 2016.

Several demographic indicators have shown very positive changes in the period 2002–2016 (table I.1). Life expectancy at birth has increased for both males and females, to 4.8 years and 8.6 years respectively. The death rate has declined and the infant mortality rate has halved, from 29.6 deaths per 1,000 live births in 2002 to 15.0 deaths per 1,000 live births in 2015.

### *Economy*

The traditional economic activity in Mongolia has been based on agriculture, mostly livestock. The country also has extensive mineral deposits, such as coal, copper, molybdenum, tin, tungsten and gold, which have become the main drivers of economic development.

In 2016, agriculture produced 11.68 per cent of the country's GDP and the latest available figures (for 2015) showed that agriculture employed 28.45 per cent of the labour force. The agriculture sector is still heavily focused on nomadic animal husbandry, with about 73.51 per cent of the total land area allocated to

pasture use. Animals raised commercially include sheep, goats, cattle, horses and camels. Animals are raised primarily for meat, although goats are valued for their hair, which can be used to produce cashmere. Crops produced include corn, wheat, barley and potatoes.

Mining is extremely important to the national economy. In 2016, the mining sector accounted for 20 per cent of GDP, 85 per cent of exports, over 30 per cent of national budget revenue and over 70 per cent of the country's foreign direct investment (FDI).

Coal is the country's largest export. In copper mining and in manufacturing higher value, finished copper products, the Mongolian Government has established joint ventures with foreign governments and private ventures. The most important of these is the Oyu Tolgoi mine, which started the production of copper concentrate in 2013. The Oyu Tolgoi joint mining venture is the largest financial project in Mongolian history and it is estimated that the mine will account for more than 30 per cent of the country's GDP when it reaches its full production level.

### Economic development

The Mongolian economy suffered several blows at the end of the 1990s. In 1996, the economy stalled, due to a series of natural disasters and decreases in world prices of copper and cashmere. The collapse of public revenues and exports and the impact of the Asian financial crisis followed in 1998 and 1999. Finally, in August and September 1999, the country's economy suffered from a temporary Russian ban on exports of oil and oil products. GDP growth, which in the period 1996–1999 had been 3 per cent on average, dropped to 1 per cent in 2000.

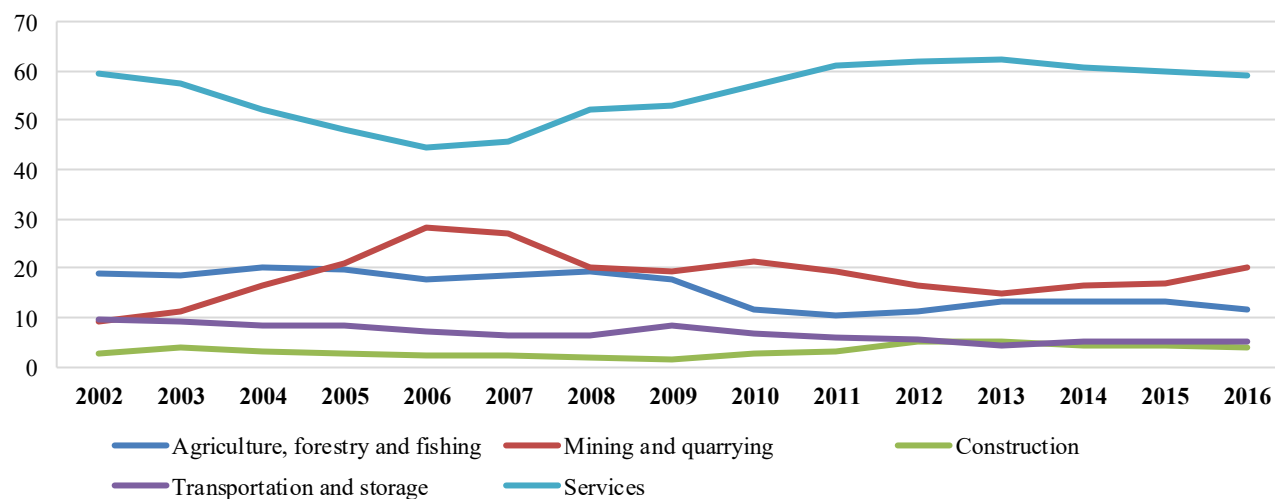
GDP growth accelerated at the beginning of the 2000s. In 2002, GDP growth was 4.73 per cent and reached 10.63 per cent in 2004 (figure I.1). The annual average GDP growth between 2004 and 2008 was 9.12 per cent, mainly due to high global copper prices and new gold production in the country. In 2008, the global financial crisis hit Mongolia and the economy contracted by 1.27 per cent in 2009.

In early 2009, the IMF reached a US\$232 million Stand-by Arrangement with Mongolia to ensure the country's quick return to a strong and sustained growth path with low inflation. The strategy was successful and Mongolia emerged from the crisis with a stronger banking sector and better fiscal management.

**Table I.1: Demographic and health indices, 2002–2016**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Population (in millions)	2.466	2.495	2.522	2.551	2.583	2.620	2.666	2.716	2.761	2.812	2.868	2.930	2.996	3.058	3.120
Crude birth rate (per 1 000 people)	19.1	18.4	18.1	17.8	19.0	21.7	24.1	25.7	23.1	25.1	26.0	27.5	28.0	27.1	25.9
Total fertility rate	2.1	2.0	2.0	1.9	2.1	2.3	2.6	2.8	2.4	2.6	2.7	3.0	3.1	3.0	3.0
Life expectancy at birth (in years)	63.5	63.6	64.6	65.2	65.9	66.5	67.2	68.0	68.1	68.3	68.7	69.1	69.6	69.9	69.6
Life expectancy at birth: female (in years)	66.5	66.5	67.8	68.6	69.4	70.2	71.0	71.8	72.3	73.8	74.3	75.0	75.5	75.8	75.1
Life expectancy at birth: male (in years)	60.8	60.8	61.6	62.1	62.6	63.1	63.7	64.3	64.9	64.7	64.9	65.4	65.9	66.0	65.6
Percentage of population under 15 years old	32.6	32.6	32.6	32.6	28.5	28.5	28.1	27.6	27.2	27.6	27.0	27.3	28.0	29.5	30.0
Percentage of population above 65 years old	3.5	3.5	3.5	3.5	4.1	4.1	4.1	4.0	3.9	3.8	3.8	3.8	3.9	3.7	3.7
Death rate (per 1 000 people)	..	..	..	..	..	..	..	..	6.7	6.9	5.9	..	5.7	5.8	5.6
Mortality rate, infant (per 1 000 live births)	29.6	23.0	22.3	20.7	19.1	17.6	19.4	20.0	20.2	16.5	15.5	14.6	15.1	15.0	..

Source: National Statistics Office, 2017.

**Figure I.1: GDP by sector at current prices, 2002–2016, per cent**

Source: National Statistics Office, 2017.

In 2010, GDP was again on a growth path and in 2011 the GDP growth rate reached a very high 17.29 per cent. The strength of the commodity exports and high government spending kept annual economic growth at higher than 10 per cent until 2013. After that year, Mongolia's export-based economy started to suffer from the global economic slowdown affecting the mining industry and particularly because of the decreasing growth in China, Mongolia's main export market. The GDP growth rate has been decreasing since 2011 and the latest available GDP growth figure (for 2016) was a very anaemic 0.98 per cent.

Since 2002, the inflation figures, measured by the Consumer Price Index (CPI), have oscillated wildly from 0.5 per cent to over 25 per cent. Inflation reached its highest level, 25.06 per cent, in 2008, dropping immediately to 6.28 per cent in 2009. After 2009, there were two peak years, 2012 and 2014, when inflation increased to 14.98 and 13.02 per cent respectively. The latest available CPI figure (for 2016), however, was a very low 0.55 per cent.

FDI in the extractive industries has transformed Mongolia's economy from its traditional dependence on herding and agriculture to being an export-dependent country. Currently, exports of goods and services account for more than 50 per cent of GDP and 44.37 per cent of export income comes from extractive industry products such as copper ore, gold and coal briquettes. Mongolia also depends heavily on trade with China, the destination of 74.76 per cent of the country's exports. FDI is very important for developing extractive industries and the FDI fluctuations have defined the economic development of the whole country. In the four years from 2009 to 2012 Mongolia attracted US\$12.594 billion worth of net FDI. In 2011, this massive inflow of investment to the economy was worth 43.91 per cent of the country's GDP, but in 2015 the investment boom was over and net FDI was down to 0.8 per cent of GDP.

The remittances from Mongolians working abroad, particularly in the Republic of Korea, have also formed a substantial part of GDP. Between 2002 and 2015, remittances accounted for 4.05 per cent of GDP annually, on average. However, the remittances share of GDP has been steadily falling and in 2016 formed only 2.33 per cent of GDP.

The unemployment level has stayed within relatively tight margins. The peak unemployment figure, 8.23 per cent, was reached in 2012, curiously, at the same time that GDP was booming with a 12.32 per cent growth rate. At its lowest in 2006, the unemployment level was 3.20 per cent. In the period 2002–2016,

annual average unemployment was 6.28 per cent, while the latest figure (for 2016) was 6.69 per cent.

The poverty level has stayed surprisingly stable through the dip in GDP after 2008 and the steady increase of the unemployment rate up until 2013. The share of the population living below the national poverty line income was 21.4 per cent in 2007, diminishing just a little to 21 per cent in 2013.

### *Gender*

Mongolia ratified the Convention on the Elimination of All Forms of Discrimination against Women in 1981, and submitted its eighth and ninth periodic reports in 2014.

The adoption of the Millennium Development Goals (MDGs) in 2005 led the State Great Khural (Parliament) to set concrete gender-related policy targets in employment, education, political participation and health, leading to the adoption of the 2008 Comprehensive National Development Strategy (CNDS) for the period 2008–2021, which is based on the MDGs and serves as an overarching policy to ensure the achievement of MDG targets. The Strategy had provisions to increase the number of female candidates in parliamentary elections and strategic objectives for the adoption of a separate law on gender equality, the integration of gender equality content at all levels of education, and ensuring women have equal rights to property. In 2016, the Strategy was repealed with the adoption of the 2016 Mongolia Sustainable Development Vision 2030 (chapter 1).

The 2011 Law on Promotion of Gender Equality regulates the responsibilities of specific public agencies in ensuring gender equality in various spheres. The adoption of the Law was an important step forward because, before 2011, Mongolia lacked a specific law on gender. A Mid-term Strategy and Action Plan for Implementation of the Law on Promotion of Gender Equality for the period 2013–2016 was adopted in 2013. Many sectoral laws, such as the 2015 Criminal Code, 2002 Civil Code, 1999 Law on Labour, 2016 Law on Domestic Violence, 2011 Law on Health and 2002 Law on Education, have gender equality provisions.

The 2016 UNDP Gender Inequality Index gave Mongolia a score of 0.278 in 2015, ranking it 53rd of the 188 countries compared, while the World Economic Forum's 2016 Gender Gap Report gave Mongolia a score of 0.705, ranking it 58th of 144 countries.

The OECD's Social Institutions and Gender Index (SIGI) measures the level of gender inequality in social institutions by a non-weighted average index of five sub-indices on a scale ranging from 0 to 1 (higher levels indicate greater inequality). The general score value for Mongolia in the 2014 SIGI was 0.0345, placing it among the countries with a very low level of gender discrimination in social institutions. In the sub-indices, the country had a very low level of discrimination in family code, low levels in civil liberties and restrictions on resources and assets, and medium levels in physical integrity and son bias.

The World Bank's gender parity index (GPI) shows a clear/sharp change in Mongolia's gender parity since 2002. There were and still are clear gender parity differences between the educational levels; however, the advantage held by females has diminished over the review period. The 2002 GPI parity figure for primary school enrolment was 1.01, while the parity index at the secondary level was just a little higher, 1.19, and at the tertiary education level was 1.78, indicating female overrepresentation at all education levels, but especially at the tertiary level. In 2015, the situation had changed, with primary school enrolment parity at 0.98, while the parity index at the secondary level was just a little higher, 1.02. At tertiary education level the GPI in 2015 was 1.38, still indicating female overrepresentation but at a much lower level than in 2002.

Although the political representation of women in the State Great Khural is still at a relatively low level, there has been an increase of the number of female parliamentarians since 1997. According to UNSTAT's MDG indicators, the proportion of female legislators in the State Great Khural increased from 7.9 per cent in 1997 to 14.9 per cent in 2015. Women are still underrepresented in ministerial positions but the situation is changing. The 2013 presidential election had the first female presidential candidate ever, though her campaign was unsuccessful.

### **I.3 Institutions and administrative division**

The President is the head of state, commander of the armed forces and head of the National Security Council. The President is elected by popular vote for a four-year term and can be elected for a maximum of two terms. The President proposes a Prime Minister, can dissolve the State Great Khural, can initiate legislation and has a restricted veto power over legislation. The State Great Khural can override the presidential veto with a two-thirds majority vote.

The Prime Minister, elected for a four-year term, is the head of the Government. The Prime Minister is proposed by the President and confirmed by the State Great Khural. The Prime Minister chooses a Cabinet with the approval of the State Great Khural.

The State Great Khural is a unicameral parliament with 76 members. Members are elected by simple majority vote from 76 election districts. Polling is valid only if at least half of the registered electors have turned out in each constituency. Parliamentary elections are held every four years. The Speaker and Vice-speaker of the State Great Khural are elected by members by an open vote.

The judiciary has a three-tiered court system divided into first-instance, appellate and supreme courts, all of which have three chambers for civil, criminal and administrative cases.

The Supreme Court has a Chief Justice and 24 judges. The Supreme Court Chief Justice and judges are appointed for life by the President upon recommendation to the State Great Khural by the General Council of Courts, a 14-member body of judges and judicial officials.

There is a Constitutional Court (or Tsets) which reviews the conformity of various acts and decisions with the Constitution. It consists of a Chairperson and eight members. The members are appointed by the State Great Khural upon nominations – three members each nominated by the President, the State Great Khural and the Supreme Court – and the Chairperson of the Court is elected from among its members. The term of appointment is six years.

Appellate and first-instance courts are at every administrative level: aimag (provincial), capital city, soum, intersoum and district levels. For administrative issues, administrative courts are divided into all administrative levels.

Administratively, Mongolia is divided into 21 aimags (provinces) and the capital, Ulaanbaatar (annex IV, map 1). Provinces are subdivided into soums (districts). Since 2006, Mongolia has had 330 soums. Soums are further divided into smaller administrative units called baghs (of which there are 1,613). The difference between these is that soums always have a permanent settlement as their administrative centre but many baghs do not. Ulaanbaatar is divided into nine districts (düüregs), which are further subdivided into 152 subdistricts called khoroo.

***PART I***  
***ENVIRONMENTAL GOVERNANCE AND FINANCING***





## Chapter 1

# POLICYMAKING, LEGAL AND INSTITUTIONAL FRAMEWORK

### 1.1 Policymaking framework for the environment, green economy and sustainable development

#### *Development planning system*

Until 2015, the development planning system was not regulated by a single comprehensive legal act and was characterized by different approaches among various institutions and levels of government. Since 2015, the Law on Development Policy Planning defines the process of drafting, approval, implementation, monitoring and evaluation, and reporting of the development policy documents.

Several governmental organizations were entrusted with development planning in the period 1987–2016. Currently, this responsibility is vested with the National Development Agency (NDA) established in August 2016 under the Prime Minister.

The 2015 Law on Development Policy Planning defines the system of long-term, medium-term and short-term policy documents:

- The Development Concept of Mongolia is a long-term policy document to be implemented for a period of 15–20 years.
- Medium-term policy documents to be implemented for a period of 8–10 years are: State Policy; Regionalized Development Policy; Development Vision for Aimag and the Capital City.
- Medium-term policy documents to be implemented for a period of 3–5 years include: Governmental Action Plan; Aimag, Capital City, Soum and District Governor's Action Plan; National Programmes and Sub-programmes; and Public Investment Programme.
- Short-term policy documents to be implemented for a period of one year are: State General Guideline for Socio-Economic Development; General Guideline for Socio-Economic Development for Aimag, Capital City, Soum and District; state and local budgets.

There are clear requirements for monitoring the implementation of development policy documents,

including the requirement of organizing a mandatory external auditing of implementation. The Prime Minister's Office maintains a United Information System for Governmental Monitoring. In each national governmental institution there is a monitoring and internal audit office whose tasks include monitoring the implementation of relevant policy documents. Only a few ministries make the implementation reports on the sectoral policy documents accessible to the public through their websites, the most prominent example being the Ministry of Food, Agriculture and Light Industry.

#### *Strategic documents on green economy and sustainable development*

##### Early years

In the period from the 1990s to the early 2000s, the key policy documents outlining the country's development vision included the 1996 Development Concept of Mongolia, 1998 Mongolian Action Programme for the 21st century (MAP 21) and 2001 Regional Development Concept of Mongolia. MAP 21 was formulated on the basis of the outcomes of the 1992 United Nations Conference on Environment and Development and was the first document in the country based on the principles of environmental protection and reliance on domestic resources. As recognized by Mongolia's 2015 national report "Managing the Transition from the Millennium Development Goals to the Sustainable Development Goals", these early policy documents encountered many challenges in their implementation and failed to serve as a foundation for the governmental action programmes. This was for a number of reasons, including the focus on introducing market principles rather than development priorities, the Asian economic crisis, macroeconomic instability and structural deficiencies, and the absence of an integrated system for implementation, monitoring and evaluation of national development policy.

##### 2008 Comprehensive National Development Strategy

The 2008 Comprehensive National Development Strategy (CNDS) for the period 2008–2021 was the

first long-term policy document. The MDGs were strongly embedded in the CNDS. The CNDS included eight priority directions, 124 strategic goals and 523 activities. It had a strong emphasis on citizens' participation, partnerships among stakeholders and governmental accountability.

The six priority directions of the CNDS were to:

- Achieve the MDGs and provide for all-round development of the Mongolian people;
- Intensively develop export-oriented, private-sector-led, high-technology-driven manufacturing and services, with particular focus on information, communications development, promoting bio- and nanotechnology, transit transportation, logistics, financial mediation services and deeper processing of agricultural products, and create a sustainable, knowledge-based economy;
- Exploit mineral deposits of strategic importance, generate and accumulate savings, ensure intensive and high economic growth and develop modern processing industry;
- Ensure intensive development of the country's regions and their infrastructure and reduce urban-rural disparities;
- Create a sustainable environment for development by promoting capacities and measures on adaptation to climate change, halting imbalances in the country's ecosystems and protecting them;
- Consolidate further political democracy, foster a transparent, accountable, just system free from corruption and red tape.

Selected environmental priorities of the CNDS included:

- Implement a rehabilitation policy based on economic assessment of damage caused to nature and the environment;
- Prepare and implement a programme and plan of action to reduce air pollution in Ulaanbaatar City and major towns;
- Expand the network of specially protected natural areas and create a sound structure of their administration;
- Create an environmental monitoring system meeting international standards;
- Promote capacity to adapt to climate change and desertification and reduce their negative impacts.

The CNDS was meant to be implemented in two stages (2007–2015 and 2016–2021). In 2016, it was repealed with the adoption of the 2016 Mongolia Sustainable Development Vision 2030.

The CNDS was an important step towards developing a stronger development planning, monitoring and evaluation system in the country. It included criteria for assessing the achievement of the MDGs, a list of national and regional programmes to serve as vehicles for implementation of the CNDS and clear reporting requirements.

A 2011 evaluation of the CNDS found an insufficient understanding of the Strategy as a fundamental document for long-term development. The 2014 CNDS evaluation report concluded that few objectives were fully met and many challenges were encountered. Mongolia's 2015 national report "Managing the Transition from the Millennium Development Goals to the Sustainable Development Goals" recognizes that:

- Medium- and short-term development policy documents such as the Governmental Action Plan, the annual Guideline for Socio-Economic Development, and sectoral and intersectoral development policy documents have been not fully coordinated and made coherent with the CNDS;
- The coordination of CNDS implementation among the ministries was inadequate and some intersectoral objectives were left out/overlooked;
- Election platforms of political parties have not been aligned with the CNDS objectives.

#### 2010 National Security Concept

The 2010 National Security Concept (2010 Resolution of the State Great Khural No. 48) understands environmental security as a component of national security. It requires the country to apply the principles of meeting the basic human needs within the limits of renewable natural resources, and using non-renewable or gradually renewable resources for the country's development as additional factors.

#### 2012 Governmental Action Plan for the period 2012–2016

The 2012 Governmental Action Plan for the period 2012–2016 (2012 Resolution of the State Great Khural No. 37) had five objectives: a Mongolian with a job and income; a healthy and strong Mongolian; an educated and knowledgeable Mongolian; a Mongolian in a safe environment; a free Mongolian. One of the activities envisaged under the Action Plan was to make green development policy one of the fundamental development policies of the country.

### 2014 Green Development Policy and 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030

In 2014, in response to the outcomes of the 2012 Rio+20 conference, Mongolia adopted the 2014 Green Development Policy (2014 Resolution of the State Great Khural No. 43). The Policy aims to ensure that green development becomes one of Mongolia's fundamental development policies. It advocates for changing the current "Grow first and clean-it up later" approach in order to improve the quality of living conditions by building inclusive economic growth and by increasing productivity based on the development of environmentally friendly and non-waste production.

In 2016, the Government adopted an Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 (2016 Government Resolution No. 35). The Action Plan is a good effort to adapt the globally available knowledge on green economy to Mongolia's reality. Based on the six strategic goals and 51 targets of the Policy, the Action Plan identifies 255 activities to be implemented in two stages – until 2020 and until 2030 (figure 1.1).

Since 2013, Mongolia participates in the Partnership for Action on Green Economy (PAGE), a mechanism to coordinate action of the United Nations system on green economy and assist countries in achieving and monitoring the SDGs. Under PAGE, specific efforts are applied in Mongolia on: green development policy assessment; support for adoption of green development indicators and measurements; green jobs; green buildings; sustainable public procurement; waste management; sustainable finance; green economy learning; and trade opportunities for Mongolia in a transition to a green economy. One of the key results is the approval by the National Statistics Office (NSO) in July 2017 of 38 green development indicators for measuring progress towards the Green Development Policy (chapter 3).

### 2016 Mongolia Sustainable Development Vision 2030

The 2016 Mongolia Sustainable Development Vision 2030 (SDV) replaced the CNDS as a national long-term policy document. The document has been designed with a view to incorporating the SDGs while reflecting the national features and priorities of the country. The SDV will be implemented in three phases: 2016–2020, 2021–2025 and 2026–2030. It includes a vision and objectives for sustainable economic development, sustainable social

development, environmental sustainability and governance for sustainable development.

The SDV's strategic area *Sustainable economic development* focuses on agriculture, tourism, mining, industry, energy and infrastructure, favourable business environment and the macroeconomic sector. The SDV's strategic area *Sustainable social development* focuses on ensuring social equality through inclusive growth, an effective, high quality and accessible healthcare system and a knowledge-based society. The SDV's strategic area *Environmental sustainability* focuses on integrated water resources management (IWRM), coping with climate change and protecting ecosystems (table 1.1). Most objectives of the SDV are accompanied by measurable targets broken into subtargets by phases of implementation. Furthermore, the SDV has 20 indicators to measure its overall implementation (table 1.2).

### 2016 Governmental Action Programme for the period 2016–2020

The Governmental Action Programme for the period 2016–2020 largely echoes the Green Development Policy and the SDV. Its section 4, *Policy on environment and green growth*, includes a number of provisions to promote green growth. It adds an emphasis on education and support to individuals, local communities, economic entities and organizations engaged in environmental protection.

#### *Strategic documents on environment*

##### General

The 1997 State Policy on Ecology (1997 Resolution of the State Great Khural No. 106) was the first long-term visionary document on the environment and sustainable development. It was envisaged to be implemented in three stages (1997–2000, 2000–2010 and 2010–2020). It was centred around the concept of "ecological balance" and included policy directions for environmentally friendly development in agriculture, forestry, water management, fuel and energy, industry and services, geology, transport, tourism, urban development and health. The document included measures on the rational use and protection of land resources, forest resources, water resources, subsoil resources, plants and wild animals. The Policy had references to economic assessments, fees for use of natural resources, efficiency in the use of resources, respect for traditions and customs and the value of international cooperation, in particular on ODS and climate change. No assessment of the Policy's implementation was prepared.

**Figure 1.1: Strategic objectives of the Green Development Policy and activities of the Action Plan for the Implementation of the Green Development Policy for the period 2016–2030**

Strategic objective 1: Promote resource-efficient, low-carbon production and consumption with emphasis on waste reduction	<ul style="list-style-type: none"> <li>•70 activities in areas of renewable energy, energy efficiency, green building, transparency and accountability in extractive and processing industries, nature conservation, rehabilitation, environmentally sound advanced technologies and techniques and sustainable agriculture</li> </ul>
Strategic objective 2: Maintain ecosystem balance and reduce environmental degradation while intensifying reclamation activities and environmental protection	<ul style="list-style-type: none"> <li>•63 activities in areas of ecosystem balance, utilization reserve of natural resources, environmental pollution, healthy and safe environment, climate change, desertification, land degradation and eco-tourism</li> </ul>
Strategic objective 3: Promote investment in environmental protection, human development and clean technology and leverage tax, credit and incentive mechanisms to finance green economy	<ul style="list-style-type: none"> <li>•34 activities in areas of green economy, finance, taxes, loans, leverages, suitable incentives, introduction of advanced clean technology, investment and sustainable public procurement</li> </ul>
Strategic objective 4: Promote green jobs, reduce poverty and promote green lifestyle	<ul style="list-style-type: none"> <li>•36 activities in areas of green jobs, proper employment, livelihoods, adaptation to climate change, natural disasters, enhancing capacities and eco-friendly lifestyles</li> </ul>
Strategic objective 5: Make education, science and technology and innovation accelerators of green development by promoting environmentally adapted style and cultural values	<ul style="list-style-type: none"> <li>•17 activities in areas of education, science, innovation, private investments in green technologies, environmental management standard ISO 14000, sustainable development and education for green development</li> </ul>
Strategic objective 6: Plan and implement human settlement adapted to climate change, and natural resources carrying capacity	<ul style="list-style-type: none"> <li>•34 activities in areas of environmentally sound infrastructure, transportation network, "green", "smart" cities and settlements that reduce environmental pollution, and comfortable and clean living environment</li> </ul>

Source: Green Development Overview, Ministry of Environment and Tourism, 2016.

**Table 1.1: Selected objectives and targets on environmental sustainability under Mongolia Sustainable Development Vision 2030**

Objective	Targets for 2020	Targets for 2030
Increase drinking water supply that meets health standards, and improve the availability of sanitation and hygiene facilities.	Ensure that 80 per cent of the population is supplied with safe drinking water, and 40 per cent of the population uses improved sanitation and hygiene facilities.	Ensure that 90 per cent of the population is supplied with safe drinking water, and 60 per cent of the population uses improved sanitation and hygiene facilities.
Adopt environmentally friendly advanced technologies, and reduce the emission of carbon dioxide from production and consumption.	Reduce greenhouse gas emissions by 2 per cent by promoting renewable energy sources, introduce advanced technologies in liquefying and carbonating coal and shale, encourage the introduction of MNS ISO 14001 package standards of environmental management, and double the number of companies possessing "standards certificates".	Increase the manufacturing of products using high technologies and innovation, reduce greenhouse gas emissions by 14 per cent from the current levels, encourage introduction of MNS ISO 14001 package standards of environmental management, and increase the number of companies possessing "standards certificates" tenfold.
Preserve the natural landscape and biodiversity, and ensure sustainability of the ecosystem services.	Mitigate desertification, increase the area of specially protected areas to 25 per cent, and raise the forest cover to 8.5 per cent of the country's total territory.	Continue mitigating desertification, increase the area of specially protected areas to 30 per cent and raise the forest cover to 9 per cent of the country's total territory.
Improve the planning of cities and urban settlements, enhance the quality of and accessibility to infrastructure facilities and improve the quality of the environment and waste management systems.	Increase the area of green facilities in urban areas and settlements to 15 per cent of the total area, increase the amount of recycled waste to 20 per cent of total waste, and have no air pollution in Ulaanbaatar City.	Increase the area of green facilities in urban areas and settlements to 30 per cent of the total area, and increase the amount of recycled waste to 40 per cent of total waste.

**Table 1.2: Indicators of Mongolia Sustainable Development Vision 2030**

Indicator	Measuring unit	Base level (2014)	Target level (2030)
Annual average economic growth	per cent	7.8	6.6*
Gross national income per capita	US\$	4 166	17 500
Human Development Index	rank	90	70
Life expectancy	years	69.57	78
Poverty rate	per cent	21.6	0
Global Competitiveness Index	rank	104	70
Doing Business Index	rank	56	40
Environmental Performance Index	rank	111	90
Share of the population with social insurance coverage in the total economically active population	percent	84.4	99
Gini coefficient of inequality	score	36.5	30
Infant mortality ratio per 1 000 live births	ratio	15.1	9
Maternal mortality ratio per 100 000 live births	ratio	30.6	15
Number of students per class at high school (national average)	number	27.3	20
Area of the land with disease free status for international trade certified by World Animal Health Organization	per cent	0	60
Area of desertified land	per cent	78.2	60
Area of specially protected land	per cent	17.4	30
Number of foreign tourists travelling to Mongolia	million persons	0.392	2
Share of the households using reliable electricity	per cent	89	100
Share of the processing sector exports in total exports	per cent	17	50
Share of main fuel products supplied from domestic production	per cent	0	100

Note: \* Average in 2016-2030.

In March 2017, following Recommendation 03–03 of the National Security Council, the Government approved the National Programme on Reduction of Air and Environmental Pollution (2017 Government Resolution No. 98) to be implemented in two phases (2017–2019 and 2020–2025). The Programme has a

strong focus on air pollution but also addresses water and soil pollution, wastewater treatment and waste management. Despite being a national programme, it devotes significant attention to the environmental problems of Ulaanbaatar. The objectives of the Programme are to:

- Reduce pollution sources with environmentally friendly and advanced technologies and innovation, and promote mitigation of polluting emissions by step-by-step prohibition of raw coal;
- Improve air and environmental quality by implementing an optimal policy for urban development, planning and infrastructure and development of rural areas, and decentralization;
- Take comprehensive measures to reduce pollutant vehicle emissions;
- Enhance the legal environment by establishing a better administration, management, financing, obligations and accountability system for reducing air and environmental pollution;
- Increase community and citizen participation in reduction of environmental pollution, encourage more healthy behaviour, build the capacity of environmental monitoring and expand research.

The Programme devotes strong attention to environmental problems of ger districts. It envisages limiting the expansion of ger districts in the capital city, limiting migration to the capital, establishing infrastructure for building single houses in ger districts by implementing the affordable housing programme and providing mortgages. It also envisages resettling households living in ger districts to apartments (70,000 households to be moved to apartments by 2025). The Programme includes a number of quantitative criteria and indicators to evaluate implementation against the 2016 baseline.

### Air

The 1999 Air Protection Programme (1999 Government Resolution No. 82), accompanied by an action plan, covered the period 1999–2010. It was among the early documents to draw attention to the air and environmental pollution in Ulaanbaatar, Erdenet, Darkhan, Choibalsan, Murun, Sukhbaatar and other urban areas, and the impacts on human health. The Programme had three major objectives: to create a legal and regulatory environment for air protection activities; to improve the quality of the air quality monitoring and testing equipment and raise capacity of the personnel; and to create a social and economic basis for air protection measures. It also emphasized the need to encourage the participation of governmental agencies and non-governmental organizations (NGOs), business entities and citizens in the implementation of the Programme. The Programme contributed to enhancing the legal framework on air protection and raising awareness about air pollution.

Air-quality-related measures of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 include but are not limited to: banning the use of raw coal other than in thermal power plants; encouraging the supply of improved fuel to ger areas; establishing (in fact, re-establishing) an anti-air pollution fund; and expanding air quality monitoring and conducting air pollution monitoring in ger districts.

### Climate change

The National Action Programme on Climate Change (NAPCC) (2011 Resolution of the State Great Khural No. 2) aims to promote capacity development and measures on adaptation to climate change. It addresses institutional, legislative, financial, capacity, education, public awareness and research aspects. The Programme also includes adaptation and mitigation strategies and measures for key socioeconomic sectors. In 2011, the Programme's implementation plan for the first phase (2011–2016) was approved. It focuses on strengthening national mitigation and adaptation capacities, setting up legal, structural and management systems and improving community and public participation. In the second phase (2017–2021), climate change adaptation measures will be implemented and greenhouse gas (GHG) mitigation actions will be started. Key implementation approaches are to align climate change actions with the National Security Concept, sustainable development and green growth goals and to introduce progressively advanced scientific and environmentally sound techniques and technologies in GHG mitigation and climate change adaptation. As of 2017, the Programme needs to be aligned with the targets of the Intended Nationally Determined Contribution (INDC). Implementation of the Programme is impeded by the lack of strong institutional mechanisms. An interministerial joint working group on climate change issues existed in the past but is no longer operating. The Climate Change and International Relations Department of the Ministry of Environment and Tourism is not really active on climate change issues and coordination. The need for a high level national committee on climate change is felt.

The Strategy for Reducing Climate Change, Adapting to Climate Change and Protecting Public Health (2011 Order of the Minister of Health No. 404) specifically addresses adaptation measures in the health sector.

The climate-change-related targets of the 2016 SDV are to reduce GHG emissions by 2 per cent by 2020 and by 14 per cent by 2030.

### Ozone layer

The National Ozone Layer Protection Programme for the period 1999–2030 (1999 Government Resolution No. 129) has five stages; the last stage is for the period 2015–2030. Mongolia receives assistance from the Multilateral Fund for the Implementation of the Montreal Protocol. The Government is implementing a licensing and quota system for HCFC imports and exports. There were some difficulties in the implementation of the HCFC Phase-out Management Plan and alternative technologies for extruded polystyrene (XPS) foam industries. The total consumption of HCFCs for 2015 was 0.64 ozone depletion potential (ODP) tons, which is below the allowable level of consumption under the Montreal Protocol.

### Desertification

The first National Plan of Action to Combat Desertification was approved by the Government in 1996 (1996 Government Resolution No. 163). It stressed the importance of preventive measures, awareness-raising and an integrated approach. The Plan of Action was renewed by the Government in 2003 (2003 Government Resolution No. 141). It was then implemented in two phases (2003–2007 and 2008–2011). The implementation allowed for the gathering of information on the situation with desertification, enhancing the relevant initiatives of aimag and soum governments and establishing a regular monitoring system. The implementation experience demonstrated weak capacity to decrease the impact of desertification and inadequate awareness of the public regarding the impacts of desertification.

The National Action Programme to Combat Desertification (2010 Government Resolution No. 90), covering the period 2010–2020, aims to prevent, cope with and revert desertification and land degradation to ensure environmental sustainability, improve the livelihoods of the rural population and generate environmental services of global importance. Its priorities are: strengthening institutional capacity; improving the legal and policy framework; enhancing science, technology and knowledge; increasing advocacy, awareness-raising and education; and intensifying concrete actions at the grassroots level (chapter 12). It has two phases (2010–2015 and 2016–2020). The first phase envisaged actions to strengthen legislation on combating desertification, capacity-building and increasing public participation in actions

to combat desertification. The second phase includes actions on rehabilitating and restoring degraded and vulnerable areas adversely affected by desertification.

### Forests

The main goal of the 2001 National Forest Programme (2001 Government Resolution No. 248), designed for the period until 2015, was to increase the national capability of forest protection, rational utilization of forests and forest rehabilitation. Since the early 2000s, Mongolia had several projects in the forestry sector, supported by the Food and Agriculture Organization of the United Nations (FAO), Asian Development Bank (ADB), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and other organizations. Achievements have included the introduction of participatory/community-based forestry management.

The 2005 Green Belt National Programme (2005 Government Resolution No. 44) aims to create a "green belt", which covers the junctional area between the Mongolian Gobi and steppe regions. The afforestation efforts are to reduce the present intensification of loss in forest reserves, desertification, sand movement and dust and sand storms. The Programme has three phases and is to be implemented over a 30-year period. Practical and financial support with afforestation and establishing nurseries in desert areas is provided by the Government of the Republic of Korea with a budget of about US\$10 million over the period 2007–2016.

In 2014, the National Programme on Forest Tending (2014 Government Resolution No. 30), designed for four years, was approved by the Government. The Programme envisaged massive forest cleaning after a long period when such cleaning was not done in Mongolian forests. The Programme is implemented primarily by the Forest Research and Development Centre, a government-funded organization under the Ministry of Environment and Tourism. Mongolia has 18.3 million ha of forests and 2 million ha are subject to cleaning under this Programme.

The 2015 State Policy on Forests (2015 Resolution of the State Great Khural No. 49) takes into account the outcomes of the national forest inventory done in 2014–2015 in cooperation with GIZ. It aims to ensure the stabilization of the Mongolian forest ecosystem, halt the loss and degradation of forests, increase forest area through regeneration and afforestation and establish sustainable forest management. The State Policy on Forests states the target to increase the area covered by closed forests to 8.3 per cent of total territory in 2020 and to 9 per cent in 2030. Particular emphasis is made on protecting the forests from fires,



pests and diseases; forest restoration through increased financing and improvements in seed preparation and quality; introducing national forest certification; production of wood-substituting fuels; and combating illegal logging.

The specific forest-related targets of the 2016 SDV are to raise the forest cover to 8.5 per cent of the country's total territory by 2020 and to 9 per cent by 2030.

As of mid-2017, under the UN-REDD Mongolia National Programme, the REDD+ National Strategy is being prepared.

### Biodiversity

Mongolia's first National Biodiversity Action Plan (1996 Government Resolution No. 163) dates back to 1996. It is the first document that recognizes that, if biodiversity is to be conserved, environmental protection must be integrated into the country's development projects and resource use. Mongolia made two reviews of the Plan's implementation, in 2002 and 2010. The first review concluded that there was a lack of coordination in carrying out the actions and so there were significant gaps in implementation. As a result of this, a committee was established to oversee the implementation of the Plan and a government fund set up to facilitate implementation. The second review showed that, of the 87 actions in the 1996 Plan, over 96 per cent were complete or near completion by 2010.

The second strategic document on biodiversity, entitled National Biodiversity Programme for the period 2015–2025 (2015 Government Resolution No. 325), (chapter 11) was developed in the period 2012–2015 in response to the adoption of the Aichi Biodiversity Targets at the tenth Meeting of the Conference of the Parties to the CBD (COP 10) in 2010. It includes 14 goals, 29 objectives and 74 outputs within the frame of four strategies to ensure the conservation and sustainable use of biodiversity (chapter 11).

The Government also adopted programmes and action plans for conservation of specific species (e.g. National Programme for Argali Conservation (2002 Government Resolution No. 269 (no longer valid)), Mongolian National Action Plan for the Protection and Sustainable Use of Threatened Plants (2002 Government Resolution No. 105), Mongolian National Action Plan for the Protection of the Saker Falcon, designed for 2003–2010 (2003 Government Resolution No. 121 (no longer valid)), National Programme for the Protection and Farming of Fish (2008 Government Resolution No. 267) and National

Programme for the Conservation of Rare and Endangered Species (2011 Government Resolution No. 277)). In addition, the National Programme for Red Deer (2000 Resolution of the State Great Khural No. 31) was approved. The National Programme for Snow Leopard Conservation (2005 Order of the Minister No. 195), National Action Plan for Saiga Conservation, designed for 2007–2010 (2007 Order of the Minister No. 361) and National Action Plan for Taimen Conservation, designed for 2007–2012 (2007 Order of the Minister No. 361) were approved at the level of the ministry responsible for environmental issues.

### Protected areas

The National Programme on Special Protected Areas (1998 Resolution of the State Great Khural No. 29) contributed to expanding the special protected area (SPA) network and improving SPA management. The National Programme was designed with three implementation phases (1998–2005, 2005–2015, and 2015 and beyond). An assessment of implementation was done in 2009 in the framework of a project jointly implemented by the then Ministry of Nature, Environment and Tourism and WWF-Mongolia Country Office. The implementation process was rated "moderate" (scoring 2.76 of 5) and implementation quality was rated "unsatisfactory" (scoring 1.41 of 4). Nevertheless, during the period of the Programme's implementation, Mongolia expanded the national SPA network from 21,731 million ha in 2000 to 27,207 million ha in 2014. Currently, national SPAs cover 27,953 million ha, or 17.87 per cent of the country's total territory. Besides national SPAs, there are also local protected areas (LPAs) covering almost 13 per cent of the total territory. Major challenges for the management of the SPA network include sustainable financing of the network, monitoring and inspection, implementation of co-management approaches and tourism and land use in protected areas.

As of 2017, a new SPA programme is to be developed. As the country committed to increase the SPA area to 30 per cent (46.9 million ha) of its territory by 2030, the new programme would have to plan such an expansion of the network and ensure its proper management. Currently, about 250 locations (including LPAs) have been identified to be researched and possibly protected as national SPAs in the future.

### Water

The 2016 SDV places an emphasis on IWRM and includes a number of water-related targets, e.g. to

ensure that, by 2030, 90 per cent of the population is supplied with safe drinking water and 60 per cent of the population uses improved sanitation and hygiene facilities. The Governmental Action Programme for the period 2016–2020 prioritizes support to: the introduction of wastewater recycling technology; recycling wastewater to fit the grey water standards, enabling it to be used for the technological purposes of a sewerage system or watering green areas; accelerating the step-by-step renovation work of the central wastewater treatment plant (WWTP); and enabling the utilization of recycled wastewater and groundwater for industrial technology needs.

The key specific water-focused policy document is the Water National Programme (2010 Resolution of the State Great Khural No. 24), which has two phases (2010–2015 and 2016–2021).

The strategic goals of the Water National Programme include: protection of Mongolia's water resources and conservation of their purity and natural replenishment; establishment of a comprehensive network for the monitoring of water resources and adoption of new management and information management technologies; creation of the conditions necessary for an accumulation of water resources, provision of drinking water meeting health standards, and improvement of the agricultural and industrial water supply; improvement of the use and management of water resources, development of the legislative and institutional environment so as to coordinate the multiple requirements for the use of water; capacity-building; and fostering civil participation and the provision of the public with information on the protection and use of water resources using advanced technologies. The Programme highlighted the importance of institutional development and capacity-building and stipulated the establishment of new agencies – the water basin councils and the State-owned enterprise now called Mongol Us ("Mongolian Water"). Key achievements in implementation of the first stage of the Programme include establishment of the legal framework for the introduction of IWRM in the period 2009–2013, rehabilitation or improvement of 169 springs in the period 2012–2016 and establishment of 124 new monitoring points in the period 2014–2016.

As a result of the 2008 National Programme on Safe Drinking Water Supply (2008 Government Resolution No. 84, no longer valid with the adoption of 2010 Government Resolution No. 34), new WWTPs were built in several aimags and hydrological research was done to increase the population coverage with safe drinking water.

The 2012 Khatan Tuul National Programme and Action Plan (2012 Government Resolution No. 203) aims to protect and sustainably manage the Tuul River basin, which covers a total area of about 50,000 km<sup>2</sup> extending over seven districts of Ulaanbaatar and 37 soums of five aimags. The Tuul River, the main source of water supply for Ulaanbaatar, is heavily polluted by insufficiently treated and untreated sewage and sillage. Between 170,000 and 190,000 m<sup>3</sup> of improperly treated wastewater is discharged into the Tuul River daily. The Programme is implemented in two stages (2012–2016 and 2017–2020) and includes measures to improve water quality and protect the river source, small rivers and streams flowing into the Tuul River. The Action Plan of the Khatan Tuul National Programme for 2012–2016 includes activities on water supply, environmental protection, water quality monitoring, wastewater treatment technology upgrade, and reuse of treated wastewater. All WWTPs in Ulaanbaatar along the Tuul River are to undergo technological innovations. The Programme provides for discontinuation of the exploitation of sand and gravel from the Tuul River and technical and biological rehabilitation. In 2014, the Tuul River Basin Administration implemented the Tuul River Improvement Project with support from the Poverty Reduction Fund of the Government of Japan. As of 2017, the central WWTP of Ulaanbaatar City is undergoing a technological upgrade with the building of a new secondary treatment unit and a new biological filter under the second phase of the project Renovation of the Central Wastewater Treatment Plant in Ulaanbaatar.

The water-related measures of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 include: installing advanced and environmentally friendly technology in sewerage systems in Ulaanbaatar's central WWTP and other settlement areas; moving tanneries, wool processing factories, vehicle markets and construction materials markets out of the city step by step; ensuring compliance with protection zone regimes at the Tuul River and its tributaries; and preparing for step-by-step resettlement of families living in flood-prone zones and near the dams.

### Waste

The majority of the waste collected in the country is sent for disposal. About 93.5 per cent of waste is disposed of by burial. The 2014 Green Development Policy calls for promoting sustainable consumption and production patterns, along with reduced waste generation.

The Government adopted the 1999 National Programme on Waste Reduction (1999 Government Resolution No. 50) for the period 1999–2010. A major contribution towards its implementation has been made through international projects, in particular the project Improvement of Ulaanbaatar City Waste Management System with support from the Government of Japan and Japan International Cooperation Agency (JICA).

The Waste Management Improvement Programme for 2014–2022 (2014 Government Resolution No. 298) sets a number of targets on waste management, including the target of 12 per cent reuse or recycling to be achieved by 2022 against 4.4 per cent in 2013, and increasing the number of waste sites that meet the sanitary requirements from three in 2013 to 40 in 2022. Phase I (2014–2017) focuses on improving the legal framework for the reduction of waste, capacity-development for infrastructure and financing, increased participation of communities and the private sector, and behavioural changes in the population. The development and adoption of the 2017 Law on Waste Management is one of the implementation outcomes. Phase II (2018–2022) is aimed at restoration of the environment from damage caused by contamination by waste and the establishment of a proper waste management system. The challenges for implementation of the 3R (reduce, reuse, recycle) policies, among others, include the lack of an incentive system for recycling, the current substantial role of the informal sector in the collection of recyclables, and the limited technological and financial capacity of the domestic recycling industry.

The achievements in implementation of the Healthcare Waste Management Strategy and Action Plan for the period 2009–2013 (2009 Order of the Minister of Health No. 293) include a centralized healthcare waste management plant built in Songinokhairkhann District of Ulaanbaatar in 2009–2010, the introduction of environmentally friendly healthcare waste disinfection with high pressure stream and adoption of a number of regulations and instructions on healthcare waste management through the orders of the Minister of Health in 2011. Equipment and supplies for healthcare waste management were provided to many hospitals and health centres with the support of several WHO-funded projects.

The National Implementation Plan (NIP) for the Convention on Persistent Organic Pollutants (Stockholm Convention) was approved in 2006. Following the inclusion of new chemicals in the Convention, the national inventory was conducted in 2013. The NIP was updated in 2014 (2014 Government Resolution No. 341). The objectives of

the updated Plan include reducing POPs release into the environment and further reducing adverse effects on human health, reducing PCDD/F releases from unintentional sources, and identifying and remediating sites contaminated by POP pesticides. An objective of the Plan is also to achieve a "PCB-free country" (chapter 10). Activities will be implemented in two phases (2014–2020 and 2020–2030). Phase-out of the use of polychlorinatedbiphenyl (PCB)-containing equipment is expected by 2020. Estimated funding required for the NIP implementation for the period 2014–2030 is US\$520 million; it will be necessary to attract international financial and technical assistance in addition to national funds.

The specific waste-related targets of the 2016 SDV are to increase the amount of recycled waste to 20 per cent of total waste by 2020 and to 40 per cent by 2030.

The waste-related measures of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 include improving infrastructure for sorting, collecting and transporting ger district ash and solid waste, and enacting regulations for management of waste streams (packaging, accumulators, batteries, luminescent lights, tyres and lubricants).

#### *Sectoral development with a possible impact on the environment*

The 2016 SDV explicitly defines three principles for sectoral development, all of them being relevant for green economy and environmental protection:

- Adopt advanced technologies with high productivity in each sector, and encourage new products and services adopting innovations;
- Encourage production methods that are resource efficient, i.e. low in GHG emissions and pollution;
- Strictly comply with the principles of efficiency and effectiveness in all economic and social sectors.

The status of the "core" ministry, possessed by the Ministry of Environment and Tourism since 2012, allows this ministry to ask other (sectoral) ministries to implement its decisions. It can contribute to better integration of environmental requirements into sectoral policies. At the same time, the lack of strategic environmental assessment (SEA) of sectoral policies, programmes and plans, prescribed by the 2012 Law on Environmental Impact Assessment but not implemented in practice, prevents the systematic, coherent and comprehensive integration of environmental measures and requirements into sectoral policies.

## Mining

In 2015, the mining sector accounted for 16.1 per cent of GDP and 19.6 per cent of budget revenue. In 2015, there were 1,170 different mining sites extracting 80 kinds of minerals from among 8,000 reserves. By 2015, 1,494 mining licences and 1,835 exploration licences had been granted. The mining licensed area made up 0.8 per cent, and the exploration licensed area made up 8.11 per cent, of the total area of the country. The main minerals produced by the mining sector include copper concentrate, molybdenum concentrate, coal, gold, fluor spar concentrate, iron ore and zinc concentrate.

Some studies on the impacts of mining on the environment and herder communities were conducted in the framework of international projects. No assessment of the impact of the mining sector on the environment is systematically conducted by the governmental institutions.

A number of environmental and social issues are connected with the mining sector. With many large-scale mines operating in the country, and many local people involved in artisanal and small-scale mining (ASSM), mining has had an enormous impact on the lives and well-being of herder communities. This includes effects from mining-induced dust, changes to water resources and pasture availability, resettlement and displacement of herder families and communities. For artisanal miners, the major issues are occupational safety, health and social conditions. Key environmental concerns include the impacts on the quantity and quality of water resources due to both large-scale mining and ASSM, though the lack of historical data and limited monitoring make identifying mine-associated impacts on water a problem. Because of the lack of roads and the trends in global market prices, many licence holders are currently waiting on exploitation; the environmental impact could therefore increase in the future when these licence holders start operations. Most of these issues, however, are vaguely addressed by existing policy documents.

Relevant policy documents include the State Policy on Radioactive Minerals and Nuclear Energy (2009 Resolution of the State Great Khural No. 45) and the State Policy on Petroleum for the period until 2017 (2011 Resolution of the State Great Khural No. 65).

The aims of the 2014 State Policy on the Minerals Sector (2014 Resolution of the State Great Khural No. 18) are to establish a stable investment environment, improve innovation in mineral exploration, mining and processing, encourage the use of modern,

environmentally friendly technologies and strengthen the international competitiveness of Mongolia's mining industry. The Policy also seeks to improve existing laws and regulations regarding occupational safety, artisanal mining, the issuance and transfer of mining and exploration licences, mineral deposit evaluation, gold mining and dispute resolution.

The 2014 Green Development Policy includes the following mining-related measures:

- Promote resource-efficient and low-waste technologies in the mineral resources sector;
- Prevent the negative impacts on human health and the environment that may arise from mining activities by ingraining transparent and responsible mining practices, and enhancing environmental protection, restoration activities and the effectiveness of offset mechanisms;
- Create the Sovereign Wealth Fund from mining sector revenues and utilize it to ensure long-term sustainable development;
- Assess and evaluate environmental, cultural and historical heritage risks and impacts of mining and major development projects prior to their implementation.

The two primary mining-sector-related objectives of the 2016 SDV are to:

- Support geological sector development;
- Encourage transparent and accountable extractive industry and improve the competitiveness of the mining sector.

The latter objective includes developing environmentally friendly infrastructure and transportation networks and implementing projects on reliable water supply sources to support the mining sector.

The 2016 Governmental Action Programme for the period 2016–2020 focuses on measures to establish a favourable investment environment for the geology and mining sector and improve Mongolia's competitiveness in the international minerals market. A relatively new focus is on creating the processing industry for mined products, e.g. by increasing oil extraction and constructing an oil refinery, supporting the construction of a copper concentrate smelter and refinery, creating the conditions to construct a metallurgical complex in Darkhan and Selenge Aimags, and setting up a plant for liquefied fuels and lubricants. The environment-related measures in this document are to improve the legal basis for creating cooperatives in the artisanal mining sector and

bringing the process of mine rehabilitation and closure up to international standards.

In early 2017, the Government adopted a Gold-2 National Programme (2017 Government Resolution No. 20); previously, the Gold Programme and the Gold-2000 Programme existed. The primary objectives of the Gold-2 National Programme are to ensure long-term development in the gold industry until 2020, intensify exploration and develop legislation. It does not have an environment-related dimension.

The Second Universal Periodic Review of Mongolia (2015) under the auspices of the United Nations Human Rights Council includes a recommendation (accepted by Mongolia) to elaborate and implement a national action plan on the use of mercury in the artisanal mining sector in order to protect the health of workers involved in the work of this sector, as well as the environment. Mongolia banned the import of mercury and its use in 2007. Nowadays, there is still illegal use of mercury by artisanal miners to separate gold from mined dirt and rock, though the scale of this practice has diminished. As of mid-2017, no national action plan on the use of mercury in the artisanal mining sector was elaborated.

There is no policy document that would specifically

address the abandoned and damaged mining areas and their rehabilitation. There is no policy document that would specifically target the creation of opportunities for artisanal miners to switch to other areas of employment.

### Energy

About 98 per cent of the energy sector is State owned; only renewable energy sources (primarily, wind) are privately owned. The sector is generally characterized by low energy efficiency and impacts on urban air pollution. The heating and electricity needs in Ulaanbaatar are met by three existing coal-based combined heat and power (CHP) plants (CHP-2, CHP-3 and CHP-4), with CHP-2 being the most polluting and requiring urgent closure. According to the Government, the supply-side situation is alarming due to the rapid growth in electricity and heating demand against the context of the ageing CHP plants. To address this, a process to build the CHP-5 plant in eastern Ulaanbaatar is ongoing. Outside Ulaanbaatar, the majority of aimag and soum centres lack proper access to heating services. In these areas, heating is provided by heat-only boilers, which are old and inefficient. While considerable progress has been registered in providing aimag and soum centres with access to electricity, most bagh centres are still not electrified.

**Photo 1.1: Miners' village, Khailaast bagh, Zaamar Soum**



Some efforts were applied to develop renewable energy. Mongolia has huge wind power potential, as well as hydropower potential. In the period 1999–2010, the Government implemented a "100,000 solar homes" programme (1999 Government Resolution No. 158), which supplied gers with free solar panels and batteries. The outcomes of this programme are sustainable, meaning the gers continue to use solar panels.

The 2005 National Renewable Energy Programme (2005–2020) set the renewable energy targets of 3–5 per cent by 2010 and 20–25 per cent by 2020. The Programme is not considered valid at the moment as it was integrated into the 2015 State Energy Sector Policy (2015 Resolution of the State Great Khural No. 63).

The 2014 Green Development Policy has stipulated energy-related targets as follows: reduce GHG emissions in the energy sector, through increased energy efficiency by 20 per cent in 2030, and by ensuring that the share of renewable energy used in total energy production is at 20 per cent by 2020 and 30 per cent by 2030.

The 2016 Action Plan for Implementation of the Green Development Policy for the period 2016–2030 includes the following measures:

- Implement projects of solar power plants with 10–50 MW capacity, in phases;
- Implement projects of wind power plants with 50–250 MW capacity, in phases;
- Construct multi-purpose water reservoir complexes by building dams at larger rivers and lakes (550 MW on the Eg and Selenge River basins, 150 MW on Khovd River basin and 100 MW on Orkhon River basin);
- Decrease GHG emissions per capita and improve the efficiency of coal-fired power plants, through the implementation of advanced and clean technology requirements for the new coal-fired thermal and power plants, such as Baganuur, Thermal Power Plant 5, Mogoin Gol Power Plant;
- Reduce environmental pollution and emissions and meet the international standard requirements by systematically upgrading current coal-fired thermal power plants, heating and industrial furnaces;
- Implement systematic energy audit and measures to reduce energy and heat losses.

The 2015 State Energy Sector Policy replaced the 2005 National Renewable Energy Programme and the 2007 National Programme for Integrated Energy System. It includes the following strategic goals:

- Ensure secure and reliable supply of energy;
- Develop mutually beneficial relationships in respect of energy with countries of the region;
- Develop and improve the human resources capacity in the energy sector;
- Implement the transition of the energy sector to a private-sector-based, regulated and competitive market;
- Introduce innovation and advanced technology in the energy sector as well as an energy efficiency and saving policy;
- Increase renewable energy generation and reduce adverse environmental impacts of conventional energy sources and GHG emissions from the energy sector.

The State Energy Sector Policy has included the following energy-related targets: a 20 per cent reduction of GHG emissions from the energy sector by 2020, and increasing the share of renewables in energy production to 20 per cent by 2023 (not by 2020 as in other documents) and to 30 per cent by 2030.

The 2016 SDV's energy sector targets are to increase the share of renewable energy in the consumption of total energy to 20 per cent by 2020 and to 30 per cent by 2030. The SDV also aims to initiate preparation for a nuclear power plant and to begin using energy from the nuclear power plant by 2030. The energy efficiency targets of the SDV are to reduce heat losses in buildings by 20 per cent by 2020 and by 40 per cent by 2030. Another key objective of the SDV is to ensure reliable access to energy to all, with the share of households using reliable electricity reaching 100 per cent in 2030 compared with 89 per cent in 2014.

The energy-related measures of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 include:

- Banning, step by step, the use of raw coal in urban centres (other than in thermal power plants);
- Encouraging the supply of improved fuel to ger areas;
- Expanding the production of improved fuel to substitute for raw coal;
- Providing 50–100 per cent discount for off-peak electricity consumption for ger district households with a 2-phase electricity meter;
- Supporting action for coal processing and enrichment and coal-to-gas production;
- Demolishing heat-only boilers in Ulaanbaatar;
- Developing and implementing an energy efficiency national programme and a gas supply master plan;
- Developing regulations, procedures and standards for the Energy Efficiency Law.

The 2009 State Policy on Radioactive Minerals and Nuclear Energy includes the objective to make Mongolia one of the leading countries in the exploitation, utilization and export for peaceful purposes of nuclear energy.

### Transport

Railway transport covers a limited area, is not competitive and faces a huge lack of investment. Inland water transportation is not well developed. Roads play the main role in transportation. Almost all roads in the country are dirt tracks, which contribute to land degradation (chapter 12), generate dust and necessitate increased fuel consumption and more frequent vehicle maintenance. In 2008, about 2,700 km of the 49,500 km of the national intercity roads were paved. In 2016, there are 7,500 km of paved roads and 16 aimags are connected to Ulaanbaatar by paved roads.

The key transport-related objectives of the 2016 SDV are to expand and develop the roads and transportation logistics network to serve the agricultural, industrial and mining sectors, and to extend the asphalt roads. The SDV also includes an objective to supply the main types of fuel products meeting international standards from domestic production. The respective targets are to meet up to 20 per cent of the national demand for main fuels from domestic production meeting the Euro-4 standard by 2020, and to meet up to 100 per cent of the national demand for main fuels from domestic production meeting the Euro-5 standard by 2030.

The 2014 Green Development Policy pays attention to development of an environmentally sound infrastructure and transportation network and to public transportation in cities and urban settlements as part of the "green city" concept. Its 2016 Plan emphasizes the need to develop environmentally sound transportation solutions for mineral products and to electrify the railroad networks. It also foresees the implementation of the Ulaanbaatar metro project – an initiative that has been discussed for many years. Upgrading of public transportation vehicles is also envisaged. The Ministry of Roads and Transport Development has plans to increase the use of CNG buses in public transport and to encourage the use of LPG vehicles. A pilot project to teach drivers of public buses to do eco-driving is ongoing. There is also an understanding of the need to address the issue of lead-containing batteries.

Mongolia's INDC (chapter 7) restates the country's commitments to improve the national paved road network, increase the share of private hybrid road vehicles from approximately 6.5 per cent in 2014 to

approximately 13 per cent by 2030, and shift from liquid fuel to LPG for vehicles in Ulaanbaatar and aimag centres by improving the taxation and environmental fee system. Additional transport-related actions include development of a Bus Rapid Transit system and improvement of the public transport system in Ulaanbaatar.

The National Strategy on Ensuring Road Traffic Safety, covering the period 2012–2020, and its implementation plan, have been approved by the 2012 Government Resolution No. 146. The goal of the Strategy is to reduce the numbers of deaths and injuries from road traffic accidents in the period from 2012 to 2020 by 50 per cent. The Strategy and plan include measures to improve traffic safety management, integrate traffic planning with road network planning and passenger and freight transport planning, increase the security of vehicles, educate traffic participants and improve the quality of emergency care. The indicators to assess the Strategy's implementation include: to reduce the cases of death due to road traffic accidents per 10,000 vehicle registrations to 8.8 in 2020 compared with 17.5 in 2012; and to reduce the number of people injured per 10,000 vehicle registrations to 24 in 2020 compared with 48.1 in 2012. According to WHO data, the number of people injured per 10,000 vehicle registrations was 39.3 in 2015. Implementation measures included approving the revised Law on Road Traffic Safety in 2015, approving a number of standards on road safety in 2014–2015 and conducting black-spot surveys on the main road corridors. In 2017–2018, new policy documents on road safety are being developed with the support of the ADB.

The 2008 "Transit Mongolia" Programme (2008 Government Resolution No. 183) was implemented until 2015. Among other measures, the Programme envisaged studying the possibility of using electric trains in railway transportation. A feasibility study was carried out but no substantive work on electrifying the railway has followed. However, since 2015 there has been a railbus operating between major railway stations in a northerly direction. The railbus is not electrified, but it is part of the efforts to minimize road traffic.

The transport-related measures of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 include:

- Building elevated roads and improving traffic management in Ulaanbaatar;
- Banning vehicles not meeting standard requirements;

- Supporting the import and use of Euro-5-standard fuel;
- Prohibiting the import of non-standard fuel step by step;
- Improving the fuel quality monitoring system;
- Converting public transportation vehicles into gas-powered vehicles;
- Cleaning road dust with designated machinery;
- Supporting the import of electric or LPG-powered vehicles;
- Limiting the import of second-hand or old vehicles step by step.

Selected targets of the 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 are to increase the number of vehicles powered by LPG from 14,500 in 2016 to 25,000 in 2025, and to increase the share of fuel sold meeting Euro-5 standard (for both gasoline and diesel) to 50 per cent in 2019 and to 80 per cent in 2025.

### Agriculture

The agricultural sector accounts for more than 14 per cent of GDP. The livestock subsector accounts for more than 80 per cent of agricultural production. Intensive livestock farming practices are not developed; in other words, animals are, in general, spread over a huge territory. Animal husbandry has an impact on rangeland – the quality of vegetation is diminishing because of overgrazing and uneven access to water, since herders tend to stay near water sources and concentrate next to urban centres. There is no fee for using land for pasturing; however, there is a land fee (chapter 3). About 70 per cent of animals are dependent on hand wells (rather than pumped water), so decreasing overgrazing of some areas depends directly on making new hand wells and pumps in order to spread livestock to other areas. A particular challenge is to develop agriculture in the Gobi and eastern regions because of their extreme dryness. Development of animal husbandry in Gobi is also more complicated nowadays because of inadequate water supply from groundwater sources, as existing small reserves are often already used by mining companies. In Ulaanbaatar, the small tanneries processing animal skins put pressure on the water quality of the Tuul River, due to their discharge of wastewater polluted with chemical substances without proper treatment. In terms of crop farming, irrigation-based farming is poorly developed. The loss of soil fertility and croplands represents the biggest challenge for crop farming. Rodent control measures are regularly taken but with varying efficiency.

Since the late 1990s and early 2000s, extension services to herders and farmers have been provided by

the National Agricultural Extension Centre through agricultural extension centres at aimag level and agricultural extension teams at soum level. However, for financial reasons, agricultural extension centres were not established in all aimags and soums. The 2009 State Policy Towards Herders (2009 Resolution of the State Great Khural No. 63) aims to increase herders' employment, improve their health and include them in the social insurance system. The measures include exempting herder households from individual income tax. The 2009 State Policy Towards Herders also provided for evaluating opportunities for the pricing of land used for pasturing.

Agricultural production objectives are set out in the 2009 National Programme for Food Security (2009 Government Resolution No. 32, amended by 2011 Government Resolution No. 114), designed for the period 2009–2016. Among other matters, the Programme places emphasis on branding Mongolian food as organically produced food, improving food production technology, adoption of good hygiene practices in agriculture, food safety monitoring, and preventing and monitoring diseases related to nutrition. According to the Programme implementation, monitoring and evaluation report of 2014, the implementation rate for the first phase of the Programme (2009–2012) was 78 per cent. The Law on Organic Food was developed as part of the Programme and passed by the State Great Khural in 2016. The Organic Mongolia Programme was launched in 2009 at the initiative of the Mongolian National Chamber of Commerce and Industry. It made an important contribution to development of organic production through its micro-credit programme.

Mongolia is in fifth place globally for its natural and cultivated sea buckthorn resources. The Sea Buckthorn National Programme (2010 Government Resolution No. 60), designed with two phases of implementation (2010–2012 and 2013–2016) promoted the cultivation of sea buckthorn by family farms. Sea buckthorn prevents desertification and enhances soil protection, provides the population with vitamins in its fruits and ensures incomes from oil, extracted from the pulp and seeds of the sea buckthorn berry. The Programme provided funding for the production and distribution of sea buckthorn seedlings, establishment of sea buckthorn processing factories, the building of irrigation systems, a plantation station for seedlings, conducting research and training. According to the Programme implementation, monitoring and evaluation report issued in 2015, in 2010–2014, the Programme enabled 6 million sea buckthorn seedlings to be prepared and distributed. The Government has recently approved



the National Programme "Fruits and Berries" (2017 Government Resolution No. 223), to be implemented in the period 2018–2022, to increase the production and export of fruits and berries, including sea buckthorn.

The 2010 National Mongolian Livestock Programme (2010 Resolution of the State Great Khural No. 23), operating in two phases (2010–2015 and 2016–2021), aims to: establish a favourable legal environment for sustainable development of the livestock sector; develop intensive livestock breeding, to increase productivity and economic efficiency; and, in conditions of climate change, reduce the risk of livestock breeding by improving degraded rangeland and improving feed production and supply. A special programme supporting intensive livestock farming was also in place (2003 Government Resolution No. 160) in the period 2003–2015.

The Programme on the Restoration of Reindeer Husbandry and Improvement of the Livelihood Conditions of the Tsaatan (2007 Government Resolution No. 255) focused on the development and capacity-building of the reindeer herder community

through a variety of initiatives, including in the sectors of health, education, the environment and livelihoods. The Programme was implemented in two stages (2007–2011 and 2012–2015). Among other matters, the Government provided financial support to the Tsaatan people in order to improve their living conditions and restore the reindeer population and, in this way, attract more tourists to Lake Khuvsgul Nuur area in the north of the country.

The agriculture-related objectives of the 2016 SDV include: preserve the gene pool and resilience of pastoral livestock breeding to climate change; create proper flock structure of livestock in line with grazing capacity; develop intensive livestock farming; adopt new and efficient irrigation technologies; increase the area of irrigated arable lands; increase the use rate of zero-tillage farming technology in grain fields; reduce soil degradation and erosion; and support herders and herder groups and small and medium-sized farmers by providing them with modern technologies and electricity and through leasing, concessional loans and other financial instruments.

**Photo 1.2: Sea buckthorn**



The agriculture-related approaches to achieve the objectives of the 2014 Green Development Policy are to improve agricultural products' supply chains and networks, support the introduction of environmentally friendly storage and packaging technologies for agricultural products and increase the processing of raw materials such as leather, wool and cashmere. The 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 envisages the development of a climate change adaptation strategy for the agricultural sector.

### Tourism

According to the Ministry of Environment and Tourism, in 2016, 404,000 tourists visited Mongolia, contributing US\$312 million to the economy, compared with 137,000 tourists and US\$95 million in 2000. This number falls short of the objective set by the 2008 CNDS to increase the number of tourists to 1 million by 2015. Most foreign tourists coming to Mongolia are Chinese (38 per cent), Russian (18 per cent), South Korean (12 per cent) and Japanese (5 per cent).

No countrywide assessment of the impacts of tourism on the environment has been conducted. Studies were conducted in several SPAs addressing selected issues of environmental impact from tourism (e.g. land use). Green certification in tourism does not exist.

The 2016 National Tourism Development Programme 2016–2025 (2015 Government Resolution No. 324) is the first tourism-specific policy document. The Programme to be implemented in two phases (2016–2020 and 2021–2025) outlines the government policy to develop tourism in accordance with the country's features and international standards and make it one of the leading economic sectors. Among other matters, the Programme has a focus on promoting ecotourism and developing more environmentally friendly tourism, minimizing the impact of tourism on the environment and coordinating unplanned (grey sector) tourism. Constructing roads to attractive tourist locations, increasing the number of stopover stations with the necessary infrastructure (water, toilets) and preventing fires by local tourists are some of the measures envisaged in the Programme. The Programme is to be implemented through annual plans.

The 2016 SDV places an emphasis on developing ecotourism regions, products and services compliant

with environmental and health requirements and promoting Mongolia's nomadic culture and tourism brand globally. It includes a target to increase the number of foreign tourists to 2 million annually by 2030.

The same target is part of the 2014 Green Development Policy. The 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 provides for the following activities to be led by the Ministry of Environment and Tourism: upgrade and enforce the standards for tourism services and infrastructure facilities consistent with green principles; establish an incentive scheme for environmentally friendly hospitality service providers; and develop SMEs in the buffer zones of SPAs by building herders' capacities to provide tourism services.

### *Strategic documents at aimag and soum levels*

Key strategic documents at aimag level should include the Development Vision for Aimag (a medium-term development strategy) and the aimag governor's action plan. Governors' action plans are commonly implemented through short-term (annual) action plans. As an example, the Selenge Aimag Governor's Action Plan for the period 2016–2020 and its environment-related provisions is described in box 1.1. Other environment-related strategic documents in Selenge Aimag include the mining policy, implementation plan for the State Forest Policy, green areas programme, water programme, programme to combat desertification and waste programme. All these documents were adopted by the aimag's khural and their implementation is financed by the aimag's government.

Four aimags – Khentii, Bulgan, Arkhangai and Khovd – developed and approved their medium-term development strategies that are based on the SDGs, the 2016 SDV and the 2014 Green Development Policy. As of 2017, five other aimags – Dornovogi, Khvusgul, Selenge, Orkhon and Bayankhongoar – are working on development and approval of their medium-term development strategies. These strategies include aimag-specific targets and measures that address urban planning, green buildings, transportation, afforestation, sustainable production, waste management, sustainable tourism, sustainable agriculture, green investment and financing, and green employment.

### Box 1.1: Selenge Aimag Governor's Action Plan for the period 2016–2020

The Selenge Aimag Governor's Action Plan for the period 2016–2020 includes a section on environmental policy, which envisages, among others, the following activities:

- Protect forest resources and reforest at least 2,000 ha of land annually;
- Intensify the Green Selenge campaign and increase green areas;
- Implement policies on soil protection and prevention of land degradation, and conduct rehabilitation of the land that has suffered from mining exploration;
- Implement the aimag's Policy on Mining and identify and implement measures to address artisanal mining;
- Conduct research by a professional organization on flora and fauna resources and their distribution;
- Name "Nine Prides of Selenge Aimag", protect historical sites and areas of natural beauty and advertise them;
- Develop and implement a climate change adaptation strategic plan;
- Conduct research by a professional organization on desertification in vulnerable areas and intensify activities for combating desertification.

Selected environment-related activities are also part of the sections on agricultural policy, industrial development and trade, investments and infrastructure, health, education and public participation.

In the capital city, the Green Development Strategic Action Plan for Ulaanbaatar 2020 was approved in 2016. It identifies seven goals: cleaner air, sustainable transport, improved solid waste management, water security, cleaner soil, participation in sustaining the environment and climate change resilience. Its measures aim to address specific problems of the capital city, e.g. to promote optimum usage of low-emission stoves and address sanitation in the ger areas, retrofit the central WWTP, enforce pretreatment of industrial waste on site before release into the public sewerage system, relocate tanneries to the periphery of the city to decrease pollution of the Tuul River, improve the drainage system and enhance flood defence on the Tuul River.

The Ulaanbaatar 2020 Master Plan and Development Approach for 2030 includes a number of measures to green the city. Its vision is to designate rivers as SPAs and renew the existing protection area boundaries, create green areas, increase the size of SPAs, discourage the use of raw coal, improve air, soil, and water quality monitoring and limit exploration and mining activities within and around the city.

At soum level, soum development plans provide long-term vision on economic, social and environmental development. For example, in 2008, Bayangol Soum of Selenge Aimag adopted a Development Plan to 2030 and revised it in 2012. It includes provisions on rehabilitation of forests, the number of livestock in degraded areas and alternating the lands used for pasture. There are annual plans to support the achievement of the Development Plan through specific activities.

## 1.2 Sustainable Development Goals

### *Millennium Development Goals*

In 2005, the State Great Khural endorsed the MDGs (2005 Resolution of the State Great Khural No. 25) as development benchmarks for the country. In addition to eight global goals, Mongolia committed to a ninth MDG, Strengthening human rights and fostering democratic governance. The country has defined 24 targets covering the nine goals and clearly designated institutional responsibilities for each goal. In 2008, the MDGs targets and indicators were revised (2008 Resolution of the State Great Khural No. 13).

Mongolia incorporated the MDGs into the 2003 Economic Growth and Poverty Reduction Strategy and the 2008 MDGs-based CNDS, designed for the period 2008–2021.

Five MDG implementation reports were prepared (2004, 2007, 2009, 2011 and 2013).

According to Mongolia's 2015 national report "Managing the Transition from the Millennium Development Goals to the Sustainable Development Goals", goals to reduce child mortality, improve maternal health and combat HIV/AIDS, and the target to develop new information and communications technologies and build an information society, have been achieved. Although Mongolia could not halve its poverty rate, it succeeded in reducing it by one third. Goals to halve the poverty rate, reduce the youth unemployment rate, reduce the prevalence of tuberculosis and protect the environment, especially in reducing air pollution in urban settlements such as Ulaanbaatar, have not been achieved.

Besides stimulating actual progress on the ground, the MDGs have strongly influenced the development of the national development planning system in Mongolia. Among the lessons learned from MDGs implementation, governmental sources highlight difficulties in evaluating implementation of some goals due to incomplete data and methodology issues.

#### *Institutional set-up for coordination of SDGs implementation and monitoring*

Until August 2016, work on the SDGs was coordinated by the Ministry of Finance. In August 2016, the National Development Agency (NDA) was established and entrusted with, among other tasks, coordinating the work on SDGs implementation and monitoring.

The composition of the National Committee on Sustainable Development under the Prime Minister was last renewed in January 2017 (2017 Government Resolution No. 27, Annex 14). It is envisaged that this Committee will be a high-level political body to guide national efforts on the 2030 Agenda for Sustainable Development. It is chaired by the Prime Minister. Its composition includes ministers and state secretaries, as well as representatives of academia, trade unions, civil society, women, youth and mass media. The Secretariat to the Committee is provided by the NDA. However, as of November 2017, the renewed National Committee has never met.

Nine sub-working groups were established to identify national targets under the global goals (2016 Order of the Prime Minister No. 44). Eight sub-working groups were devoted to thematic goals, such as water and energy, and were led by line ministries. They were tasked to identify available indicators and, when possible, national targets. The ninth sub-working group – on Assessment of Availability of the SDG Indicators and Methodologies – was led by the NSO. All these sub-working groups had meetings throughout 2016 but had not completed their work; they defined the availability of indicators but did not progress to identify targets.

In the State Great Khural, under the Standing Committee on Social Policy, Education, Culture and Science, there is a subcommittee on the SDGs whose members are parliamentarians.

#### *SDGs in the national policy framework*

The 2016 SDV has been designed with a view to embedding the SDGs. For example, the SDV sets the national targets for 2030 with regard to Goal 6 of the 2030 Agenda (box 9.2). Furthermore, the

Governmental Action Programme for the period 2016–2020 builds on the SDV.

As of May 2017, the NDA plans to conduct a review of national policies to assess their alignment with the SDGs and, on the basis of such assessment, to identify targets for 2030. The NDA works to develop a generic questionnaire to guide the line ministries and other institutions on how to review the sectoral policies and identify targets. It is well understood that alignment of all policies with the SDGs and mainstreaming the SDGs into sectoral policies will be a challenge. It is expected that the process to come up with national targets and indicators will be completed by early 2018.

Reports on implementation of the SDV will be prepared and submitted to the State Great Khural every two years. Reports on the SDV will cover 47 of the global SDG indicators. It is envisaged that the national SDG targets and indicators will be approved by a resolution of the State Great Khural or the Government and that the reporting requirements will also be included in that resolution.

#### *Indicators*

As of October 2017, three assessments of the availability of global SDG indicators in Mongolia were carried out:

- A preliminary assessment carried out with the assistance of UNDP in November–December 2015 examined 224 indicators (defined internationally at that moment) and categorized them by eight criteria (readily available, available after little effort, available after more effort, available if data collection changed, non-applicable to Mongolia, coming from external institutions, not clear, and grey/on standby). Thirteen indicators were recognized as non-applicable to Mongolia.
- The second assessment, carried out in May 2016 by the NSO in cooperation with the sub-working groups established by the 2016 Order of the Prime Minister No. 44, has examined 241 indicators (defined by the Inter-Agency Expert Group on the SDGs as of March 2016). Of these, 13 were confirmed to be not applicable to Mongolia. The remaining 228 indicators were categorized by three criteria: readily available (60 indicators), available after additional calculation (11) and not available (157). The assessment showed that most indicators on the environment and on justice are not produced in Mongolia. The assessment also enabled identification of an additional 74 indicators relevant for and available in Mongolia.

- The third assessment was carried out under the leadership of the NSO in October 2017. Of 244 indicators analysed, 11 were defined as not applicable to Mongolia, 134 were recognized as readily available and 99 as not available.

It is envisaged that data availability for the SDGs will be expanded by using more administrative data (data collected through line ministries) and, possibly, big data. There is a small working group in the NSO led by its Deputy Head, which works to prepare an assessment of the availability of administrative data for the SDGs. Line ministries will be provided with guidance on how to make an assessment of SDG indicators in the administrative data. The key challenge is the quality of some administrative data, in terms of both its accuracy and collection frequency. In addition, the challenge is to adapt the internationally developed methodologies for some indicators to Mongolia's understanding and reality. In late 2017, the NSO launched a website dedicated to the SDGs and SDG indicators (<http://www.1212.mn/SDG-en>).

The National Strategy for Development of Statistics 2017–2020, approved in May 2017, clearly provides for the work of the NSO on SDG issues, in particular on data sources, advocacy and methodologies. It also requests the NSO to cooperate with the line ministries and the NDA on compiling baseline and current year values for the indicators. Following the establishment of targets and indicators, the NSO would need to define data flows and databases.

Overall, the NSO is up to speed with the work on the SDG indicators. However, more precise guidance from the international level and the sharing of experience with other countries would be appreciated.

#### *Awareness and ownership*

Mongolian governmental authorities and public institutions demonstrate impressive awareness about the SDGs. Public officials in the ministries (not only in the Ministry of Environment and Tourism but also in sectoral ministries), local authorities, environmental inspectors and school teachers are aware of the SDGs and of the targets related to their area of work. Such awareness is partly explained by the targeted efforts made to align the 2016 SDV with the SDGs and is also the result of a number of awareness-raising activities conducted by the national partners with support from UNDP, the United Nations Population Fund, NGO Partnership in Statistics for Development in the 21st Century (PARIS21) and other organizations. There is a high level of ownership of and enthusiasm about the SDGs. Still, some governmental officials point out

that more awareness-raising activities are needed, in particular to target non-governmental stakeholders.

### **1.3 Strategic environmental assessment**

#### *Legal requirements*

The Law on Environmental Impact Assessment as revised in 2012 has, for the first time, introduced the notion of SEA to Mongolian legislation. According to this Law, SEA is mandatory for national, regional and sectoral policies, development programmes and plans that may have an adverse impact on the environment, society and human health. The responsibility to initiate an SEA lies with the line ministry proposing a policy, programme or plan. A Professional Council (chapter 2) established by the Ministry of Environment and Tourism (the same council as for EIA) is tasked to discuss and approve an SEA report before it is presented to the Cabinet. The conclusions of the SEA report are to be presented by the minister in charge of environmental issues to the Cabinet during the discussion of a proposed policy, programme or plan.

No responsibility for failure to initiate and conduct an SEA is envisaged by the Law. Neither the Law nor subsidiary legislation specifically defines the sectors whose policies, programmes and plans are subject to SEA. The Law does not provide for the participation of affected countries or the public from affected countries in the SEA procedure.

SEA procedure is prescribed in more detail in the Regulation on strategic environmental assessment, cumulative impact assessment and environmental impact assessment, approved by the 2013 Government Resolution No. 374. The Regulation describes the principles and steps of an SEA process and content of an SEA report. It is important that the SEA report shall include not only proposals on possible options to avoid and eliminate impacts on the environment, society and human health and measures to be taken, but also monitoring and evaluation indicators and a mechanism for realization of SEA recommendations during the implementation of the proposed policy, development programme or plan.

The Regulation includes provisions for public comment on an SEA report. The ministry responsible for environmental issues should post the SEA documents (final draft of policy, development programme or plan reflecting the findings and recommendations of the SEA report and the SEA report) on its website, inviting public comment. The period available for public comment is 14 working days. A summary of public feedback is to be presented

to the Professional Council, which decides on approval of the SEA report.

While the 2012 Law is silent on the applicability of SEA to revisions of policies, development programmes and plans, the Regulation states that its provisions also apply to amendments to approved policies, development programmes and plans.

The 2014 Order of the Minister of Environment and Green Development No. A-03 defines rules for public participation in all assessments of environmental impact, including SEA. A detailed SEA methodology was approved by the 2014 Order of the Minister of Environment and Green Development No. A-117.

#### *Practical implementation*

As of late 2017, no SEA has ever been done in Mongolia in accordance with the 2012 Law. In the period 2013–2014, a Mongolian Mining Sector Strategic Environmental and Social Assessment Project was conducted by Sustainability (an Australian company), in cooperation with the World Bank and the Government of Mongolia; however, this pilot exercise did not apply the SEA methodology as approved in Mongolia.

In the last few years, the Ministry of Environment and Tourism organized discussions with and training for the line ministries to improve their understanding of the SEA instrument. Still, understanding of this instrument among the line ministries is poor. Also, the line ministries invoke the lack of funding as one of the reasons for not doing an SEA.

The Environmental Assessment and Audit Division of the Ministry of Environment and Tourism has seven staff, who cover EIA, environmental audit and SEA. So far, SEA has been given less attention by the Ministry than EIA and environmental audit, judging by the level of practical implementation of these three instruments.

Mongolia has no experience with transboundary SEA. In 2014 and 2017, Mongolia participated as an observer in the sessions of the Meeting of the Parties to the ECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) serving as the Meeting of the Parties to the Protocol on Strategic Environmental Assessment.

The 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 includes an implementation activity – Advance strategic assessment system and improve its outcomes – to be undertaken by the Ministry of Environment and

Tourism and the line ministries under implementation measure 1.3, which is devoted to environmental assessments.

### **1.4 Legal framework for the environment, green economy and sustainable development and its implementation**

#### *Environmental laws*

##### Overview of environmental legislation

In the period 1994–2000, 17 environmental laws were adopted to lay down the foundations for environmental protection and sustainable use of natural resources. These included the framework 1995 Law on Environmental Protection, 1995 Law on Water (no longer valid), 1995 Law on Water and Mineral Water Use Fees (no longer valid), 1995 Law on Natural Flora, 1994 Law on Special Protected Areas, 1997 Law on Buffer Zones of Special Protected Areas, 1995 Law on Hunting Resource Use Payments and on Hunting and Trapping Authorization Fees (no longer valid), 1997 Law on Land Fees, 1995 Law on Air (no longer valid), 1995 Law on Forests (no longer valid) and 1995 Law on Fees for the Harvesting of Timber and Fuelwood (no longer valid).

In the period 2001–2009, the laws accompanying the land reform (2002 Law on Land and 2002 Law on Allocation of Land to Mongolian Citizens for Ownership) and the laws on waste management (2003 Law on Household and Industrial Waste and 2006 Law on Toxic and Hazardous Chemicals) were enacted.

In 2012, a comprehensive revision of environmental legislation was undertaken: 18 laws were subject to the removal of duplications and contradictions, two laws were newly adopted, six laws were rewritten, eight laws were amended and 14 laws were repealed. The purpose of the revision was to improve the quality of regulation. The legislation was also aligned to international standards on a number of issues. Provisions on public participation in environmental decision-making were streamlined. Five laws regulating various user fees were substituted with the 2012 Law on Fees for Use of Natural Resources.

In the period 2012–2017, amendments were introduced into a number of existing laws.

Altogether, the environmental protection legislation includes 26 laws, about 370 standards and 75 acts of subsidiary legislation, which describe various rules and procedures.

### Law on Environmental Protection

The 1995 Law on Environmental Protection addresses the responsibilities of various governmental authorities on environmental protection, environmental assessments, environmental monitoring, research and information, environmental protection measures, environmental inspection, the participation of citizens and NGOs in environmental protection, economic incentives, and fees and payments for the use of natural resources.

In 2012, amendments to the Law introduced the concept of environmental audit and required all entities whose activities involve the use of natural resources to undergo a mandatory environmental audit every two years. Since that time, the practical application of environmental audit has seen slow progress. Subsidiary legislation for environmental audit was approved in 2013 (2013 Order of the Minister of Environment and Green Development No. A-126, with two attachments, on issuance of an auditor's licence and on the methodology of the environmental audit). About 25 environmental audit firms and 200 individual environmental auditors have been certified. However, companies try to avoid conducting an environmental audit and the capacity of audit firms is an issue. The 2012 amendments also extended the provisions on liability for damage caused to the environment and amended penalties for violation of the Law.

### Environmental assessment

The Law on Environmental Impact Assessment was first adopted in 1998. A revised version was adopted in 2012. The 2012 Law regulates four types of assessment: (i) strategic environmental assessment (SEA) – to be conducted for policies, development programmes and plans; (ii) environmental baseline assessment – to be conducted during the development stage of all project proposals and development programmes and plans in order to establish the existing conditions and state of the environment of a territory; (iii) environmental impact assessment, consisting of general and detailed EIA – to be conducted for projects (chapter 2); and (iv) cumulative impact assessment – to be conducted to evaluate the effects of various projects implemented within a defined area or basin. Among these, SEA and cumulative impact assessment were new concepts introduced in 2012. As of mid-2017, practical application of SEA has not yet started. Cumulative impact assessment was done in two cases.

An environmental management plan is prepared as part of the detailed EIA development process (chapter 2). Such a plan should not only include measures to protect and restore the environmental conditions but also provide for monitoring of potential negative consequences that may arise during implementation of the project. The annual approval of environmental management plans is conducted by the Environment and Natural Resources Management Department of the Ministry of Environment and Tourism.

### Air protection

The revised 2012 Law on Air replaced the 1995 Law on Air. It addresses ambient air protection, pollution prevention, mitigation of emissions of air pollutants and its control. The Law addresses air pollution coming from ger districts and includes such measures as expanding access to electricity for ger districts, determining on an annual basis an air quality improvement zone where a number of prohibitions (e.g. on burning raw coal) apply, and supporting migration from city to rural areas. The Law provides for incentives for households to install insulation, improve stoves and introduce other energy-efficient and environmentally friendly measures. The Law describes self-monitoring requirements for stationary source operators and includes specific measures to be introduced by such operators when there is a serious increase in air pollution. In general, the Law is heavily focused on air quality in Ulaanbaatar and other cities. There is less attention to industrial activities. The air pollution and dust emissions specific to mining regions are not addressed.

A Clean Air Fund established in accordance with the 2012 Law on Air focused on subsidizing cleaner coal fuel for the ger districts for use in stoves and subsidized air filters. The Fund was later abolished; provisions in the Law which related to the Fund were annulled in 2015.

The 2010 Law on Air Pollution Fees charges miners of raw coal, producers and importers of organic solvents, auto vehicle and self-propelled vehicle owners and owners of major stationary sources of air pollution with air pollution fees. It defines the limits of fees and exemptions (chapter 3).

### Climate change

There is no law specifically devoted to climate change. The 2012 Law on Air includes provisions on ozone layer protection, monitoring of GHG emissions and preparation of a GHG inventory. Some adaptation and mitigation requirements are included in sectoral legislation, e.g. on energy and water management.

### Land degradation

The revised 2002 Law on Land classifies land into six categories (chapter 12) and includes a section on efficient and rational use and protection of land. The Law sets the requirements for the use of land for pasturing, use and protection of hayfields and protection of crop fields, as well as application of EIA to ensure the rational use and protection of land and soil. As of 2017, a process to revise the 2002 Law on Land is under way (chapter 12).

The 2012 Law on Soil Protection and Desertification Prevention includes measures for the prevention of desertification from intensification of agriculture, mining, road construction and urban land use, as well as climate change. Soil protection measures include developing a list of areas of soil pollution and conducting risk assessment in the areas of soil pollution in order to decide on the activities to be undertaken. The Government can provide incentives to individuals and economic entities that have introduced new technologies for soil protection and prevention of desertification or implemented desertification prevention activities. The Law includes provisions on the responsibility of individuals and legal entities to eliminate the damage to soil caused by their illegal acts, and for soil rehabilitation.

### Nature protection

The 1995 Law on Natural Flora regulates the protection, sustainable use and restoration of natural flora other than forest and cultivated plants. It describes measures for the protection of flora from fire, disease, harmful rodents and insects and negative human impacts, as well as measures to protect the gene bank of extremely rare, endemic and relict flora. The Law prohibits the use of flora for commercial purposes in areas that are important for maintaining environmental and ecological balance, such as green zones in cities and other settlements, areas within 2 km of the source of a river or stream, areas important for protection from sand movement and soil erosion, and protection strips. The Law tasks soum governors to plan and take measures to properly manage the carrying capacity of rangeland and hayfields. It also authorizes citizens' representative bodies (khurals) to prohibit the use of rangeland and hayfields for a period of up to two years when such prohibition is needed to protect extremely rare flora. Commercial use of flora is subject to fees.

The revised 2012 Law on Fauna (chapter 11) replaced the 2000 Law on Fauna. It regulates the protection and breeding of terrestrial and water fauna other than livestock and domestic animals. Methods for the

protection of fauna include setting limits on fauna use, keeping records of rare and endangered species in the Red Book, protecting natural habitats and migration routes and establishing game reserves and regulating their use. The use of fauna by citizens and economic entities is subject to fees. The Law was amended in 2017 with provisions on assistance to and rescue of animals affected by accidents and hazards. For example, it prohibits the hunting of wild animals that are unable to defend themselves from tornadoes, droughts, dzuds, floods, hailstorms and fires.

The hunting and trapping of fauna is regulated by the 2012 Law on Fauna.

The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof is aimed at the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (chapter 11). It regulates the granting of CITES licences.

### Protected areas

The legislation on the management of protected areas is based on the 1994 Law on Special Protected Areas and 1997 Law on Buffer Zones of Special Protected Areas (chapter 11). The current system of SPAs includes state or national SPAs and local protected areas (LPAs). National SPAs are further subdivided into strictly protected areas (StrPAs), national parks (NPs), nature reserves (NRs) and monuments. The first two categories are managed at the national level; the third and fourth categories may be designated at the national level but are managed at the local level. The Law defines zoning of the national SPAs and the regime and prohibitions for each zone. It also defines the responsibilities of protected area administrations (PAAs) and rangers. Control and enforcement are vested in the General Agency for Specialized Inspection (GASI), PAAs and governors at all levels.

One of the problems related to implementation of the legislation on protected areas is that there are cases in which mining licences are issued for exploitation of resources in areas designated as LPAs. Local governments are obliged to inform the Mineral Resources and Petroleum Authority under the Ministry of Mining and Heavy Industry of the designation of an LPA. However, sometimes they fail to do so. Also, there are cases in which local governments fail to indicate the period of protection for an LPA or to extend the period of protection. In addition, there are problems with the mapping of LPAs – in some cases, the maps available at the Mineral Resources and Petroleum Authority differ from those at the local level. A database of LPAs has



been developed (<http://eic.mn/spalocal/>) within the Managed Resource Protected Areas project of UNDP and the Ministry of Environment and Tourism, to identify such problems. Other issues with implementation of the legislation on protected areas are related to the decrease in the budget for protected areas for 2012–2016 and the lack of a mechanism to direct resources from tourism in protected areas to management and development of protected areas.

The area per ranger is defined by the 2006 Government Resolution No. 87 and depends on the category of land (e.g. desert, 200,000 ha; forest, 40,000 ha; high mountainous land, 50,000 ha). In view of the rise in tourism in protected areas, it is felt that the land areas stipulated in this Resolution no longer correlate with what is needed, and the number of rangers is to be increased.

As of mid-2017, there is ongoing revision of the legislation on protected areas (chapter 11). A new draft law on SPAs has been developed with the support of a UNDP project. Among other issues, the revision aims to ensure sustainable funding for protected areas in order that they are not entirely dependent on the state budget and to let local residents be in charge of their management. Initiatives on implementing co-management approaches (chapter 11) have begun on a contractual basis. In particular, three protected areas are managed by NGOs (Khar Yamaat Nature Reserve by WWF-Mongolia, Hustai National Park by Hustai National Park Trust and Ikh Nart Nature Reserve by Argal Agnuur Sudlaliin NGO). But the mechanism is not thoroughly regulated by the legislation; hence, these issues are addressed in the draft.

### Forests

The legal framework for forest protection and management was laid down with the 1995 Law on Forests, 1995 Law on Fees for Forest Harvesting (no longer valid) and 1996 Law on Forest Fire Prevention (no longer valid). The 1995 Law on Forests addressed the possession and use of forests, forest types and zones (protected forest and commercial forest), forest inventories, and protection measures and penalties. The 1995 Law was significantly revised in 2012.

The 2012 revised Law on Forests prohibits clearcutting, haymaking in forests without special permission and grazing of cattle in forested areas and plantations with grown seedlings. However, there are challenges with monitoring and enforcing these prohibitions. According to the Law, illegal logging comprises not only logging without a contract or a

permit but also logging in excess of the volumes stated in a contract or a permit.

The achievements in implementation of the 2012 Law on Forests include the establishment of forest user groups; this process has been supported by several projects financed by international organizations. Under their respective contracts, forest user groups implement forest management plans. In territories they manage, illegal logging has been reduced to zero. Another achievement is the establishment of about 780 professional forest organizations, which are licensed by the Ministry of Environment and Tourism to undertake forest protection, restoration and afforestation activities at professional level, and to provide methodological advice to forest user groups and other entities.

Forest certification is not mentioned in the 2012 Law on Forests. For this reason the introduction of forest certification is lagging behind.

The 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas prohibits the issuance of exploration and exploitation licences for forested areas.

### Living Modified Organisms

The 2007 Law on Living Modified Organisms (LMOs) regulates relations in respect of producing, handling and use of LMOs, their transboundary movement and protection of biosafety within the territory of the State. It establishes the National Committee on Biosafety within the framework of the Ministry of Environment and Tourism to oversee biosafety-related matters. In particular, it has to provide its opinion on the issuance of licences for the transboundary movement of LMOs and review the conclusions of the EIA and the risk assessment done for applications for the production and manufacturing of LMOs. LMO-related production and services are subject to general EIA in accordance with the 2012 Law on Environmental Impact Assessment.

### Waste and chemicals

The 2003 Law on Household and Industrial Waste governed the waste collection, transportation, storage and landfilling of household and industrial waste, and reusing of waste as secondary raw materials. It was replaced with the 2012 Law on Waste Management, which introduced the 3R (reduce, reuse, recycle) approach. The 2012 Law was replaced with a new Law on Waste Management in 2017 (chapter 10). The new

Law covers regular solid waste and hazardous waste, except radioactive waste.

The country banned plastic bags with a thickness of 0.025 mm or less in packaging of imported food in accordance with the 2009 Law on Limited Use of Some Plastic Bags (no longer valid). This ban was repealed in 2012 with the Law on Waste Management. However, the 2012 Law included a ban on usage of plastic bags of 0.025 mm or lesser thickness in trading service. With the approval of the 2017 Law on Waste Management the ban on plastic bag usage was removed.

The 2000 Law on Prohibition of Importing, Transit and Export of Hazardous Waste (no longer valid) aimed to ensure implementation of the provisions of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. The Law prohibited the import of hazardous wastes to Mongolia for the purposes of use, storage, temporary holding or destruction. It also prohibited the transport of hazardous wastes across the borders of Mongolia. Export of hazardous waste was allowed through the mechanism of authorization. In 2012, the provisions of the Law on Prohibition of Importing, Transit and Export of Hazardous Waste were integrated into the Law on Waste Management.

The 1995 Law on Protection from Toxic Chemicals was replaced with the 2006 Law on Toxic and Hazardous Chemicals. The 2006 Law is now the major legal act governing the import, export, transboundary movements, production, transportation, storage, disposal, handling and monitoring of various toxic and hazardous chemicals. It stipulates, among other matters, a compulsory risk assessment for activities that involve chemicals. In 2007, the Government approved the List of Prohibited or Limited Use Toxic and Dangerous Chemicals in Mongolia (2007 Government Resolution No. 95). In 2009, the ministries responsible for environment and for health, and NEMA, approved the Procedures for Storage, Transport and Destruction of Dangerous and Toxic Chemical Materials (2009 Joint Order 28/40/29 (no longer valid)), later replaced with the Regulation for storage, transportation, use and destruction of dangerous and toxic chemical substances (2017 Joint Order 54/A/136/A/215).

### Water

A revised 2012 Law on Water replaced the 2004 Law on Water, incorporating numerous amendments. The 2012 Law is firmly based on the IWRM approach. It also addresses hydrological exploration and research, water monitoring and research, protection zones,

water use and permitting, the management of water infrastructure and measures to protect water resources in times of drought from desertification and desiccation. The Law defines self-monitoring requirements: all water users must have equipment installed to measure water use, and, where usage exceeds 50 cubic metres per day, users must install equipment that monitors use throughout their operations. The Law as adopted in May 2012 provided for the functioning of a National Water Agency; however, the amendments introduced in August 2012 repealed the existence of the Agency.

Major outcomes in implementation of the 2012 Law on Water are the advancement of the legal and institutional framework for IWRM. The 29 basins had been defined in 2009 but the National Integrated Water Resources Management Plan of Mongolia was adopted in 2013 (2013 Government Resolution No. 389). In 2013, the Methodology for Developing a Water Resources Management Basin Plan (2013 Order of the Minister of Environment and Green Development No. A-187) and Rules of Setting Up a Water Basin Council (2013 Order of the Minister of Environment and Green Development No. 124) were approved. Twenty-nine basins are managed by 21 basin administrations. As of mid-2017, basin management plans were approved for 17 of the 29 basins, were under development in six basins and still at the very initial stage of development for six basins. Water basin councils were formally established in many basins but do not operate because of problems with their financing.

The 1995 Law on Water and Mineral Water Use Fees has been consolidated with other laws on the use of natural resources as the 2012 Law on Fees for Use of Natural Resources.

According to the 2012 Law on Water Pollution Fees, water pollution fees are to be paid for: (i) discharges of wastewater directly to nature within the permissible limits, meeting the wastewater standard requirements; and (ii) discharges of wastewater to a sewerage system, meeting the standard of permissible maximum content of polluting substances. The Law specifies the maximum and minimum amounts of fees, which are to be further specified by the Government for each basin, taking into account the volume and quality of the water resources. As of mid-2017, there is no implementation of this Law since no subsidiary legislation was adopted. Amendments to make the Law more realistic are under discussion.

The 2011 Law on Use of Water Supply and Sewerage System in Urban and Settlement Areas regulates the ownership and utilization of water facilities required

to supply urban users with drinking water and to treat and dispose of their wastewater. This Law assigns the task of developing the legislation and policy on urban water supply and sewage disposal to the Ministry of Construction and Urban Development. It also establishes a new body, the Water Services Regulatory Commission. The Law requires a protection and sanitary zone to be established around both centralized and decentralized drinking water sources.

#### Environmental noise

Environmental noise is regulated by standards approved by the Agency for Standardization and Metrology.

#### Environmental crimes

Environmental crimes have long been part of the Criminal Code. The most common crimes refer to violations of forest, hunting, mining and forest fire protection legislation. There has been criticism that the Code's articles referring to polluting the air, polluting water and soil, and polluting the environment in general, have not been applied in practice.

Mongolia's new Criminal Code, adopted in 2015, includes chapter 24 on environmental crimes. In 2017, it was amended. The environmental crimes remained the same (environmental pollution, illegal mineral exploration and extraction, illegal activities with toxic and hazardous substances, radioactive waste and nuclear material, poaching, illegal logging, causing forest fires, etc.). However, the penalties (both fines and sentences) for poaching and illegal logging were increased.

#### Environmental offences

Each environmental medium and sectoral law indicates violations and penalties. In May 2017, a new Law on Violation was passed that includes a chapter on environmental protection. The Law codified sanctions for all violations of laws that are not considered a crime.

#### *Environment-related provisions in sectoral laws*

##### Mining

The 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas prohibited many forms of mining and provided for the protection of the most vulnerable water resources. Under the Law, the Government cancelled more than 200 mining

and exploration licences that were operational within 200 m of water sources and in forests. The Law met opposition from mining companies and there were attempts to repeal the Law, though they were not successful.

The 2009 Law on Nuclear Energy regulates, among other issues, the exploration, development and mining of uranium. It gave the Government a greater degree of control of uranium resources.

The key law for the sector is the 2006 Law on Minerals, which was amended about 20 times. The issuance of exploration licences was temporarily banned by the 2010 Law on Prohibiting Issuance of New Exploration Licences for Mining. The ban was lifted in 2014.

The most important amendments to the 2006 Law on Minerals from the environmental point of view were adopted in 2014. The amendments were introduced to require that mining operations, including exploration, must be preceded by a survey done by an organization with ethnographic, paleontological and archaeological expertise, in order to ensure that there is no harm to cultural heritage from the mining operations. Other changes made in 2014 required licence holders to give priority to Mongolian businesses in procuring goods or selling extracted, concentrated or partially processed products.

An important provision of the Law on Minerals introduces the mechanism of corporate social responsibility (CSR) agreements: a licence holder must sign an agreement and collaborate with the local administration in order to protect the environment, create infrastructure for mining operations and create workplaces. The Law does not specify which local administration (aimag, soum or bagh) is entitled to conclude such an agreement and what the financial scale of agreements should be. In practice, such agreements are mostly concluded at the level of soum governments. The agreements, however, are not publicly disclosed and there are concerns about the selection of priorities in such agreements. A model template for such agreements was approved in 2016 (2016 Government Resolution No. 179).

In 2015, the Law on Budget was amended in relation to income from minerals payments. With this amendment, at least 33 per cent of income received from royalties goes to the Local Development Funds of soums and districts where the exploration work took place, and at least 50 per cent of the licence payment goes to the Local Development Fund of soums and districts where the exploration and exploitation licence is issued. These changes aim to

ensure that mining contributes to development of the areas where exploitation takes place.

The major environment-related concern is that the EIA is conducted late in the permitting process. The EIA approved by the Ministry of Environment and Tourism is part of the feasibility study, which is done after the issuance of the special mining licence, although before the issuance of the permit to start mining operations. The Ministry of Environment and Tourism is part of the special commission that approves the permit to start mining operations; however, at this stage, the opportunities to include the results of the EIA in the permit are limited. The outcomes of the EIA can be reflected in the environmental management plan that a mining company has to submit every year to the Ministry of Environment and Tourism, and the company has to report to the Ministry on the plan's implementation. Still, the EIA instrument is not properly used as an assessment tool that precedes actual decision-making in the mining licensing process. The cumulative impact assessment instrument, although provided for in the 2012 Law on Environmental Impact Assessment, is not used.

Another key concern is that the stakeholders affected by mining projects have limited opportunities to effectively participate in the decision-making processes. Opportunities to participate are restricted to two ways: participation in EIA, which has a limited impact on decision-making, and representation of stakeholders on the local administration bodies that conclude agreements with companies in order to protect the environment. Another issue of concern is that the EIA studies reportedly pay limited attention to social issues.

Restoration of mine-affected land is addressed under the 2014 amendments to the Law on Minerals, 2012 Law on Environmental Impact Assessment and the Regulation on the Temporary and Permanent Closure of Mines (2003 Order of the General Agency for Specialized Inspection No. 309, not valid after December 2016 with the adoption of the 2016 Order of the General Agency for Specialized Inspection No. A/126). The Regulation described the process of a closure and the measures required as preparatory works for the temporary or permanent closure of underground mines and open pit mines. Still, implementation of these provisions represents a huge challenge; some sites are left without rehabilitation

and are overtaken by artisanal miners working illegally. There are about 400 companies who hold reclamation licences but only a few dozen operate in reality. Some companies with reclamation licences reportedly engage in exploration activities.

An important provision of the Law on Minerals requires the submission of transparency reports. Mongolia has been a member of the Extractive Industries Transparency Initiative (EITI) since 2006.

The Regulation on Extraction of Minerals from Small-scale Mines (approved by 2010 Government Resolution No. 308) provided the legal framework for the artisanal and small-scale mining (ASSM) sector. The technical requirements of this Regulation made the functioning of artisanal miners' cooperatives difficult. In 2017, the new Regulation on Extraction of Minerals from Small-scale Mines (2017 Government Resolution No. 151) replaced the 2010 Regulation. While the new Regulation represents a significant improvement, some technical requirements of the previous document remain unchanged (box 1.2).

### Energy

The 2001 Law on Energy regulates the issues of energy generation, transmission, distribution, dispatching and supply, energy consumption and licensing for energy-related activities.

The 2007 Law on Renewable Energy provides the legal framework for regulation of the generation and supply of renewable energy. The Law was amended in 2015 to strengthen public-private partnerships and create a market-oriented framework for the energy sector. According to the IRENA Renewable Readiness Assessment (2016), effective implementation of the Law remains a challenge, hampering the creation of the necessary conditions for renewable energy investment and development. For instance, feed-in tariffs introduced under the Law have faced two main obstacles: (i) limited duration of feed-in tariffs along with the lack of long-term price guarantees to reduce the risk associated with renewable energy investments – an issue addressed in the 2015 amendment to the Law; and (ii) currency risk. The IRENA report also highlights the need to conduct a grid assessment to ensure grid stability in the integration of variable renewables in the future. The Law stipulates the establishment of a special Renewable Energy Fund. Such a fund was established but does not exist anymore.

### Box 1.2: Legal framework for artisanal and small-scale mining

On the basis of the Regulation on Extraction of Minerals from Small-scale Mines (2017 Government Resolution No. 151), which replaced the previous regulation on the same subject (2010 Government Resolution No. 308), the Government works with those artisanal miners who follow the Regulation and organize themselves into cooperatives (partnerships) for small-scale mining in permitted sites. Artisanal miners who do not organize themselves into cooperatives work illegally and are often caught by the police.

Next to the permitted sites for small-scale mining, the soum governors have to provide healthcare and social welfare services for small-scale miners and access to schools and kindergartens for their children.

The 2010 Regulation required that a person needed to be registered as a resident of the respective soum in order to legally conduct small-scale mining as a member of a cooperative and be eligible for social and welfare benefits. A major problem for small-scale gold miners is that they are not registered in the soum where they are working. The 2017 Regulation requires registration within a given aimag, not soum.

A cooperative submits its application for the conclusion of a contract on the extraction of minerals by small-scale mining to a soum governor. The Regulation (both the 2010 and 2017 versions) however, limits an area to be used by cooperatives for small-scale mining purposes within the soum territory to 5 ha. Another requirement, present in both the 2010 and 2017 versions, states that the number of areas selected for the extraction of minerals through small-scale mining within the territory of one soum shall not exceed 10. In "popular" areas, these requirements impede the receipt of contracts by cooperatives because there is not enough land for mining for the many applicants.

Prior to returning the area, the cooperative shall carry out technical and biological rehabilitation in accordance with established guidelines, have the area assessed by an environmental inspector, and then hand over the area to the authority appointed by the soum governor. The novelty of the 2017 Regulation is that it requires rehabilitation to be done in accordance with the Frugal rehabilitation methodology.

An important provision is the prohibition of the use of chemicals and dangerous substances in small-scale mining, present in both old and new versions. In addition, both the 2010 and the 2017 versions prohibit children below the age of 18 from working in small-scale mining – this is mostly observed, as adult artisanal miners do not let minors work next to them.

The 2017 Regulation extends the roles and responsibilities of aimag governors to oversee safety in artisanal mining and to work on creating alternative work opportunities for artisanal miners.

The 2015 Law on Energy Efficiency (also known as the Law on Energy Conservation) is the first law on this topic. It establishes the Energy Conservation Council, whose powers are to be exercised by the existing Energy Regulatory Commission (ERC). The Energy Conservation Council facilitates the implementation of state policy and legislation regarding energy conservation at the national level, formulates national programmes regarding energy conservation and grants licences for energy auditors and energy managers. The Law uses the term "designated consumers" to refer to legal entities whose energy usage is above the energy consumption threshold. Each designated consumer is to be registered by the Council and has the obligations to conserve energy and use it efficiently, obtain an energy audit on its energy consumption, formulate and implement programmes regarding energy conservation and appoint an energy manager. The first group of designated consumers was announced by the Council in December 2016. Other consumers can obtain an energy audit voluntarily. The Council still has to formulate the regulations on support and incentives for citizens, legal entities and organizations that implement energy efficiency measures.

The 2009 Law on Nuclear Energy regulates the exploration and mining of radioactive minerals, construction and use of nuclear reactors, ensuring nuclear and radiation safety and protecting the population and environment from negative impacts of ionizing radiation. The 2009 Law described the powers of the Nuclear Energy Agency which was restructured into a Nuclear Energy Commission in 2015. The 2000 Law on Nuclear-weapon-free Status is also in place.

### Transport

Mongolia imports 95 per cent of all fuel for vehicles (petrol, diesel) from the Russian Federation. The national standards on fuel quality for diesel (MNS 0216:2006) and unleaded petrol (MNS 0217:2006) were renewed in April 2017 (MNS 0216:2017 and MNS 0217:2017). They will be mandatory as of October 2018. They distinguish three fuel quality classes (K3 to K5). K5 has tightened regulatory parameters for sulphur content (10 ppm), making this fuel fully compliant with European standard EN590:2009 (Euro-5). For petrol (K3 to K5), the standards require that lead concentration should be less than 2.5

ppm and that benzene content in gasoline should be less than 1 per cent.

The 2016 SDV envisages development of domestic production of fuels corresponding to Euro-4 and Euro-5 standards. The 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 envisages transition to Euro-5 standard.

The Government has used excise duties as an instrument to check the rise in the number of imported vehicles, especially older cars (chapter 3). The excise duty on imported motor vehicles increases with the engine size in cm<sup>3</sup> and the age of the vehicle. Dual-fuel (hybrid) vehicles, vehicles running on liquefied gas and electric cars have been exempt from payment of this excise duty until July 2017. However, the low excise duties on petrol and gasoline do not encourage the rational use of motor fuels (chapter 3).

In 2015, the Law on Road Traffic Safety was substantially revised. The revision introduced penalties for passengers who have not fastened their seatbelts (in addition to penalties for drivers), imposed mandatory wearing of helmets for motorcyclists, increased penalties for drunk driving, introduced fines for using cellular phones when driving and addressed drowsy driving.

### Agriculture

The 2012 Law on Soil Protection and Desertification Prevention requires pasture users to maintain rotational use of their grazing areas. Crop field users are required to use technologies to protect the soil and increase soil fertility, build windbreaks around crop fields and use crop strips of 50–100 m width and 30–50 m length. It is prohibited to decrease soil fertility from its initial level.

The 2016 Law on Organic Food regulates organic agriculture, the production of organic food, feed and fertilizers, their certification, trade and import, and use of the organic logo. The principles of organic production include the safety of soil, water, air, plants, animals and human existence and doing no harm to ecosystems. Food and feed is considered to be organic if at least 90 per cent of the ingredients are organic. The use of radiation, household and industrial waste, mud from treatment facilities, material produced with cloning technologies and LMOs is prohibited in organic production. Where forest resources and natural plants are used in organic production, they shall be harvested from fields where no disinfectant other than those specified has been applied during the last three years. Organic producers

have the duties to develop and comply with technology that conserves the natural characteristics of food raw materials and food products and has no negative impact on human and animal health and the environment. They are also obliged to use no-waste or low-waste technology and utilize water rationally. Certification of organic production process and products shall be done biennially. The conversion period for organic production is determined by the certification body on a case-by-case basis, taking into account the location and type of organic products, the conclusions of EIA and other factors.

The Law on Food as revised in 2012 aims to ensure quality, nutritious and sustainable food. Measures include creating strategic food reserves, support and incentives to national food production, activities to ensure nutritious food, supervision and control and customer support. The Law envisages the national nutrition survey to be conducted every five years.

The 2012 Law on Ensuring the Safety of Food Products focuses on state control of the safety of raw materials and food products, their packaging and labelling, and the import and export of food.

The 2016 Law on Crop Production addresses agricultural soil conditions and quality, soil conservation and rehabilitation activities and monitoring of soil quality.

A law on rangeland has been drafted but not adopted (chapter 12). The idea behind this draft law is to move to a more regulated rangeland planning and management system.

### Tourism

The 2000 Law on Tourism requires tourism organizations and companies to take necessary measures for the protection and preservation of the national properties of high historical, cultural and natural value and to report to the relevant organizations on the violations they observe. They should endeavour to develop environmentally friendly tourism that contributes to the socioeconomic development of Mongolia, as well as to the health, customs and traditions of local people.

Over 60 per cent of tourists that come to Mongolia come for the purpose of visiting its protected areas. The 1994 Law on Special Protected Areas allows tourism activities in the limited zone of strictly protected areas (StrPAs) and in the tourist zone of national parks (NPs). There are entrance fees to some protected areas. However, the revenues are not earmarked for development and management of the

protected areas network. The 1994 Law on Special Protected Areas provides that assets for financing the protection of SPAs shall consist, among other things, of income from tourism, but this provision is not implemented in practice.

#### *Other relevant laws*

The 2003 Law on State Supervision and Inspection regulates the methods, types and procedures of inspection. Its key principle is that human life and health, and social and environmental safety, shall be considered above any other interest and purpose. It established GASI as a centrally controlled organization integrating all professional inspections and financed from the central state budget. In 2010, the Law was amended to introduce risk classification of subjects of inspection.

The 2015 Law on Legislation (in force since 2017) and the 2015 Law on General Administrative Procedures include public participation procedures and aim to improve public participation in the drafting of laws and administrative decisions.

The 2014 Law on Glass Accounts obliges all government agencies and legal entities with state involvement to make information on budgets and financial matters, including the utilization of financing and other government indebtedness, available to the public.

The 2001 Law on Licensing (also known as the Law on Special Permission for the Operation of Entities) regulates the issuing, suspension and revoking of licences to conduct certain business activities that may negatively affect the public interest, human health, the environment and national security and that require specific conditions and expertise. Among other matters, licences are required for activities involving ozone-depleting substances (ODS), dangerous and toxic chemicals, plant protection products, exploration and mining of minerals and for producing a detailed EIA.

The 2005 Law on Tobacco Control was substantially revised in 2013 to ban smoking in all public areas to protect the population from the consequences of passive smoking. Smoking is banned in public transport, public places such as restaurants, trade centres, places of entertainment, bars and office spaces, except at the authorized points. All forms of tobacco advertising, promotion and sponsorship, including cross-border advertising originating from and entering the country, are forbidden. Sales of tobacco through vending machines and the Internet, as well as in bars and places of entertainment, are banned.

## **1.5 Institutional framework for environment, green economy and sustainable development**

### *Ministry of Environment and Tourism*

The ministry responsible for environmental issues was formed in 1987 (1987 Resolution of the Great People's Khural of the Mongolian People's Republic No. 169). It has remained as a governmental body at the level of a ministry since that time. Such stability of the national environmental authority, in particular its functioning at the ministerial level, has been a positive factor for consistent development and implementation of environmental policies and legislation, and facilitated the integration of environmental considerations into sectoral policies and legislation.

Since 1987, the ministry has been responsible for practically all major environmental media and issues, such as air, water, forests, soil, desertification, nature conservation, biodiversity and protected areas, waste and environmental assessments. Since 1987, key changes to the mandate of the ministry responsible for environmental issues included:

- In 2002, the responsibilities on land management were taken away from the then Ministry of Nature and Environment, as the Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) was established and the Land Administration Authority of the Ministry was transferred to ALAMGaC.
- The environmental inspection and enforcement functions were taken away from the ministry responsible for environmental issues in 2003 when GASI under the Prime Minister was established as an independent agency bringing together various thematic inspections.
- Responsibility for tourism was brought under the roof of the ministry responsible for environmental issues in 2008. In the period 2012–2014, tourism was taken away from the ministry responsible for environmental issues and given to the ministry responsible for culture. Since 2014, tourism is back with the ministry responsible for environmental issues. Governmental officials responsible for the environment and for tourism in the current Ministry of Environment and Tourism both see the added value of tourism responsibilities being in the ministry responsible for environmental issues, especially from the perspective of protected area management.
- The responsibilities for green development were added to the portfolio of the then Ministry of Nature and Environment in 2012 when it was renamed the Ministry of Environment and Green Development. "Green Development" was taken

out of the official title of the ministry responsible for environmental issues in 2016 since the NDA was then formed. However, the responsibilities for green development stayed with the ministry.

- In 2012, the National Water Agency, which had existed since 2005 as an independent governmental implementation agency under direct supervision of the ministry responsible for environmental issues and dealt with implementation of state policy on the use, protection and restoration of water resources, including water permitting, was dismantled. Its functions were transferred to the Department for Policy Implementation and Coordination of the then Ministry of Environment and Green Development.

As of 2017, the mission of the Ministry of Environment and Tourism is to ensure the human right to live in a safe and healthy environment by facilitating cooperation among the State, citizens, private entities and other organizations for the preservation of the environment and sustainable development and implementation of the SDGs.

Since 2012, the ministry responsible for environmental issues has been assigned the status of a core ministry. Core ministry status means that a ministry's activities are cross sectoral. The core ministry can ask non-core (sectoral) ministries to implement its decisions. The status of a core ministry is also possessed by the Ministry of Justice and Internal Affairs, Ministry of Finance, Ministry of Foreign Affairs, Ministry of Defence and Ministry of Labour and Welfare.

In 2017, 2,868 staff worked in the Ministry of Environment and Tourism together with its subordinated institutions. Of these, 121 staff worked in the central apparatus of the Ministry (figure 1.2). One of the key issues for the Ministry is staff turnover. In recent years, due to frequent changes of government (on average every 18 months), most staff at both senior (minister, vice-minister, state secretary) and managerial (heads of departments and divisions) levels were replaced with every change of government, impeding the consistent development and implementation of policies on the environment and green development.

#### National Agency for Meteorology and Environmental Monitoring

The National Agency for Meteorology and Environmental Monitoring (NAMEM) is the main state organization responsible for hydrological, meteorological and environmental monitoring and for

hydrological and meteorological forecasting. Its functions include early warning to prevent the impacts of natural disasters, especially on human health and livestock. Environmental monitoring was added to the mandate in 1976, when the former National Hydrometeorological Service under the Government became the Main Administration of Hydrometeorology and Environmental Monitoring. The establishment of the ministry responsible for environmental issues in 1987 made environmental monitoring more prominent and in demand.

Currently, NAMEM has the status of a government implementing agency and, at the same time, is placed under the Ministry of Environment and Tourism. The Director-General of NAMEM is appointed by the Cabinet of Ministers. Because it is a government implementing agency, NAMEM reportedly operates more independently than a traditional subordinated organization of the Ministry. The organizational structure of NAMEM (figure 4.1) includes several subordinated organizations, among them the Information and Research Institute of Meteorology, Hydrology and Environment that runs the Environmental Information Centre (EIC) (now downgraded to an Environmental Database Division (chapter 5)). In each aimag, NAMEM has a Department of Meteorology, Hydrology and Environmental Monitoring. NAMEM has 22 laboratories, of which 21 are in aimags and one is at the central level. Altogether, NAMEM employs more than 1,930 people across the country.

#### Environment and Climate Change Fund

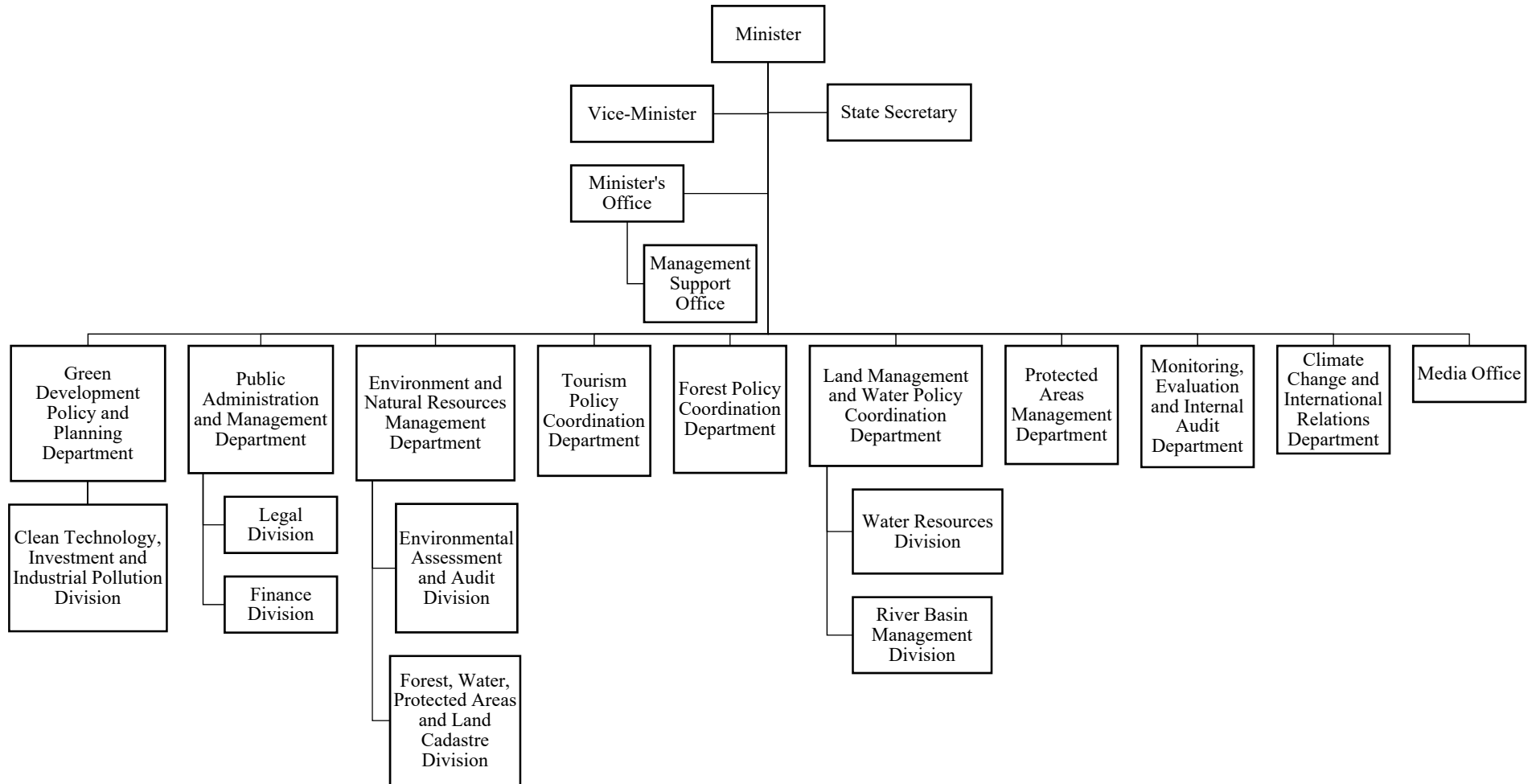
An Environmental Protection Fund was established in 1998. Until 2012, it functioned as a budget line. In 2012, it became a separate entity under the ministry responsible for environmental issues and its name changed to the Environment and Climate Change Fund. It has five staff.

#### Water basin administrations

Mongolia has 29 water basins covered by 21 water basin administrations with 208 staff in total. The chairperson of a water basin administration is appointed by the Minister of Environment and Tourism. The functions of water basin administrations are to develop a water basin management plan and coordinate its implementation, carry out a water inventory at basin level, set up water supply and wastewater removal points in the basin area, maintain a subdatabase of water basin information, provide information to the public and propose the establishment of a water basin council.



Figure 1.2: Organizational chart of the central apparatus of the Ministry of Environment and Tourism



Source: Ministry of Environment and Tourism, 2017.

### Protected area administrations

There are 33 protected area administrations (PAAs) (including three operated by NGOs), employing 607 staff. PAAs work under the supervision of the Protected Areas Management Department of the Ministry of Environment and Tourism. Some are responsible for more than one protected area. Protected areas do not have their own separate administration (e.g. an NP does not have its own park administration); some have visitors' centres. PAAs employ wildlife rangers. According to the 1994 Law on Special Protected Areas, the status of wildlife rangers is equivalent to that of environmental inspectors.

### *Sectoral ministries*

#### Ministry of Food, Agriculture and Light Industry

The Ministry of Food, Agriculture and Light Industry is responsible for the development and implementation of policy and legislation on animal husbandry, crop cultivation, food safety, light industry (wool, cashmere, printing, construction materials, wood processing, waste recycling, packaging production, cosmetics and household item production) and SMEs.

The Ministry is responsible for the packaging and safe handling of fertilizers and pesticides. The use of pesticides and chemicals in agriculture is a joint responsibility of the Ministry of Environment and Tourism, Ministry of Food, Agriculture and Light Industry and Ministry of Health.

The waste-related responsibilities of the Ministry of Food, Agriculture and Light Industry include waste management related to dead bodies of animals, waste from agro-industries and the recycling of waste generated by light industry. The Ministry of Food, Agriculture and Light Industry works with the Ministry of Environment and Tourism and the Municipality of Ulaanbaatar to address the management of waste from leather tanneries located in Ulaanbaatar, which discharge chemicals into the Tuul River basin, with an adverse impact on its water quality.

Relevant responsibilities of the Ministry of Food, Agriculture and Light Industry also include surveillance of food-borne diseases. The Ministry's subordinated organizations with a relevant mandate include the Animal Health and Breeding Agency, Veterinary Health Laboratory and the National Institute for Animal Health.

With regard to GMOs, the Ministry of Food, Agriculture and Light Industry only registers products of GMO origin.

The National Agricultural Extension Centre, set up under the Ministry in 1996, is responsible for operating and managing the public extension services for farmers and herders. It has branch offices in almost all aimags and many soums.

#### Ministry of Roads and Transport Development

In 2012, the former Ministry of Roads, Transportation, Construction and Urban Development was split into the Ministry of Construction and Urban Development and the Ministry of Roads and Transport Development. The relevant competences of the Ministry of Roads and Transport Development include the development and implementation of policy and legislation on roads, with a focus on increasing the total length of paved roads, public transport (the use of more environmentally friendly vehicles and eco-driving), safe disposal of vehicle batteries, and road safety.

#### Ministry of Mining and Heavy Industry

The Ministry of Mining and Heavy Industry has four policy development departments (for geology, mining, fuel and heavy industry) and one unified Policy Coordination Department. No department or unit is specifically assigned to environmental issues but each department has one staff member responsible for environmental issues. The mission of the Ministry, among other matters, is to promote transparent and responsible mining. Policy development on rehabilitation of mining sites and on artisanal mining are part of the Ministry's responsibilities.

Responsibilities for heavy industry were added to the portfolio of the Ministry in 2016 as part of the government restructuring, with a view to paying stronger attention to developing industrial production on the basis of extracted minerals. Since 2016, the Ministry of Mining and Heavy Industry is also responsible for fuel quality (prior to that, fuel quality was the responsibility of the Ministry of Roads and Transport Development); the objective is to develop production of domestic fuels.

According to the Ministry of Mining and Heavy Industry, abandoned mining sites, like all abandoned and damaged land sites (including former military bases), should be the responsibility of several ministries, with the Ministry of Environment and

Tourism taking the lead and other ministries participating in relevant activities.

In 2016, the previously existent Mineral Resources Authority (established in 1997) and Petroleum Authority were merged into the Mineral Resources and Petroleum Authority under the Ministry of Mining and Heavy Industry. The Mineral Resources and Petroleum Authority is in charge of geology and exploration, mining production and technology, coal research, petroleum exploitation and production. Within the Authority, a Mineral Resources Information Centre was recently established to ensure more transparency in the work of this institution. The Centre is digitalizing results of the geological surveys conducted with state funds. The cadastral department of the Agency recently started accepting online booking requests for new exploration licences.

#### Ministry of Energy

The Ministry of Energy is in charge of development and implementation of policies and legislation on energy, including power generation, grid development, district heating and thermal power plants, renewable energy and clean coal technologies. Energy efficiency is not part of its mandate but is a responsibility of the ERC.

#### Ministry of Construction and Urban Development

The main responsibilities of the Ministry of Construction and Urban Development include the development and implementation of policies and legislation on the construction sector, urban development, land use management, the building industry, building materials, housing and public utilities.

The Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) was established in 2002 following the adoption of the revised 2002 Law on Land. ALAMGaC was established by merging three different agencies under three different ministries: the Land Administration Authority of the then Ministry of Nature and Environment, the State Administration of Geodesy and Cartography under the then Ministry of Infrastructure and the Real Property Registration Authority under the then Ministry of Justice and Internal Affairs. In the period 2002–2004 it worked under the Prime Minister. Since 2004, it is under the Ministry of Construction and Urban Development. ALAMGaC is responsible for state policy on land

administration, land privatization, cadastre, geodesy, cartography, property ownership and possession and use rights.

#### Ministry of Health

The Ministry of Health manages the consolidated policy on population health, including hygiene, sanitation and safety of food production. The National Centre for Public Health (previously called the Institute of Public Health) under the Ministry is in charge of research on human health, its socioeconomic and environmental determinants, provision of public health services and provision of information to decision-makers on health-related issues. Since 2011, the Institute has a Public Health Surveillance and Information Unit. The Environmental Centre of the National Centre for Public Health conducts research on water and soil pollution.

#### Ministry of Finance

The Ministry of Finance is responsible for short-term policy planning and for the budget.

#### Ministry of Education, Culture, Science and Sports

Being responsible for early childhood education, primary and secondary education, higher education, non-formal and lifelong learning, the Ministry of Education, Culture, Science and Sports is in charge of integrating education for sustainable development (ESD) into the educational system.

#### Ministry of Justice and Internal Affairs

The Ministry of Justice and Internal Affairs reviews draft legislative acts, including those on environmental issues.

#### *General Agency for Specialized Inspection*

The General Agency for Specialized Inspection (GASI) under the Prime Minister (reporting directly to the Deputy Prime Minister) was established in 2003 as an independent agency bringing together various inspections. Prior to that date, thematic inspections were part of the responsibilities of relevant ministries.

The scope of work of environmental inspectors includes the enforcement of legislation on forests, flora and fauna, biodiversity, water, soil, air and other issues covered by 26 environmental laws. All inspectors have to undergo a professional certification.

In GASI's Directorate of Environment, Geology and Mining Inspection, seven inspectors work on environmental and tourism issues.

#### Aimag specialized inspection departments

GASI has branches at aimag level called aimag specialized inspection departments. They include environmental inspectors (about three inspectors per aimag, 65 in total) who are appointed by GASI but in consultation with the aimag governor. The environmental inspectors at aimag level receive instructions from GASI and report to GASI.

#### Environmental inspectors at soum level

There are also environmental inspectors at soum level (usually one inspector per soum); however, a soum's environmental inspectors are appointed by the chief of staff in the soum governor's office. The soum's environmental inspectors report to the soum's governor (and to the relevant aimag specialized inspection department). Soum environmental inspectors are paid from the soum government's budget. They are not subordinated to GASI but receive professional guidance from GASI. The dependency of soum environmental inspectors on soum governors is a drawback of the current system. There are cases in which a soum's environmental inspectors receive other than inspection tasks from the soum's governor.

#### Other environmental inspectors

In addition to providing professional guidance to soum environmental inspectors, GASI also provides professional guidance to inspectors (also called wildlife rangers) who are appointed by PAAs.

In addition, GASI provides professional guidance to inspectors in the capital city.

GASI also certifies the staff of internal audit departments at each ministry (so-called internal inspectors).

In addition, some staff of the Ministry of Environment and Tourism (10 staff as of 2017) have an environmental inspector's licence, which they exercise in addition to their regular work as heads of departments or specialists in the Ministry.

A peculiar feature of the system is that people outside the governmental system can act as environmental inspectors: in 2017, two people from NGOs had an environmental inspector's licence.

#### Laboratories

GASI has 24 laboratories, of which one is at the central level, one in Nalaikh City, one in Baganuur City and 21 in aimags.

#### Cooperation with the Ministry of Environment and Tourism

The establishment of GASI in 2003 aimed at the separation of the policymaking and regulatory function from the control and enforcement function. However, currently, it is common practice that aimag-level environment and tourism department staff participate in inspections conducted by aimag environmental inspectors; sometimes such inspections are also conducted together with the police. The environment and tourism department staff do not have the status of inspectors but are considered to be part of the team supporting the inspector. In addition, some staff of the Ministry of Environment and Tourism hold environmental inspectors' licences, while at the same time being responsible for policymaking and regulation activities in their capacity as staff of the Ministry. Such arrangements question the separation of the policymaking and regulatory, and control and enforcement, functions envisaged with the creation of GASI.

Positive outcomes of the current system include more efficient use of resources and strengthening of the links between thematic inspectors (e.g. mining inspectors and environmental inspectors). However, the insufficient level of cooperation between GASI and the Ministry of Environment and Tourism is a weak link in the current system. Such cooperation largely depends on personal relationships among particular public officials and seems to work better at aimag level than central level.

#### Cooperation with citizens and NGOs

Citizens and NGOs are encouraged by law to inform the inspectors and the police of alleged violations of the environmental legislation that they observe. There is a system of financial compensation (e.g. in the form of a share of the fine imposed) to informants. For example, in accordance with the 2012 Law on Forests, an NGO shall be rewarded by remuneration equal to 70 per cent of the proceeds received on the sale of confiscated weapons, vehicles or equipment that were used for criminal or other illegal activities. In accordance with the 2012 Law on Fauna, a soum or aimag governor shall issue a monetary reward to the informant equal to 15 per cent of the amount of fines and compensation damages imposed. There is also a procedure to ensure an informant's confidentiality

when it is requested. However, there is scope for improving the system to ensure that informants receive financial benefits even when they choose to remain unidentified.

#### *Other institutions*

##### State Great Khural

The State Great Khural (Parliament) approves laws and some national strategic documents related to environmental issues. Some laws vest quite important environmental competences with the State Great Khural. For example, the Law on Water as revised in 2012 assigns as responsibilities of the State Great Khural the determination of fees for water use and water pollution and the decision on the adjustment of flow of major rivers. The State Great Khural has a Standing Committee on Environment, Food and Agriculture and a Standing Committee on Social Policy, Education, Culture and Science. The latter has a subcommittee on the SDGs.

##### National Development Agency

The NDA under the Prime Minister was established in August 2016. It is responsible for development policy planning as guided by the 2016 SDV. It provides advice to the Government on investment policies, foreign investment policies, concessions and public-private partnership policy. It coordinates the work on SDGs implementation and monitoring.

##### National Police Agency

Since 2010, the Investigation Department of the National Policy Agency under the Government has a Division for Combating Environmental Crime.

##### National Emergency Management Agency

The National Emergency Management Agency (NEMA) under the Prime Minister (reporting directly to the Deputy Prime Minister) was established in 2003. It develops legislation and strategies on disaster protection, evaluates disaster risk and implements activities on disaster prevention, reduction and preparedness. It organizes search and rescue work. A Disaster Research Institute under NEMA is responsible for carrying out multi-hazard risk assessments.

##### Agency for Standardization and Metrology

The Agency for Standardization and Metrology under the Prime Minister (reporting directly to the Deputy Prime Minister) approves all national standards and

represents Mongolia in international standardization within ISO.

##### Energy Regulatory Commission

The ERC, directly accountable to the Government, is an independent regulatory authority. It was established under the 2001 Law on Energy. According to the Law on Energy, the ERC issues operational licences to energy companies involved in the generation, transmission and distribution of electrical power, monitors compliance with licence conditions, develops methodology, and reviews and approves the tariffs.

An important part of its mandate is energy efficiency. In accordance with the 2015 Law on Energy Efficiency (also known as the Law on Energy Conservation), a specialized unit was established in the ERC to implement energy efficiency policies. In 2017, the ERC signed a memorandum of understanding (MoU) with the Global Green Growth Institute to work on improving energy conservation.

##### Water Services Regulatory Commission

The Water Services Regulatory Commission was established in 2012 based on the 2011 Law on Use of Water Supply and Sewerage System in Urban and Settlement Areas. Its main duties are to define water and wastewater service tariffs and to issue special licences to legal entities.

##### National Renewable Energy Centre

The National Renewable Energy Centre was created in 2005 under the Ministry of Energy. With the restructuring of the Government, the Centre was changed into a State-owned self-financed entity under the supervision of the State Property Committee.

##### Business Council of Mongolia

The Business Council of Mongolia has an Energy and Environment Working Group whose mission is to use a multi-stakeholder approach to promote environmentally sound business practices, as well as to exchange the latest information and developments in the energy sector.

#### *Environment-related authorities at aimag and soum levels*

Administratively, the country is divided into 21 aimags (provinces) and one municipality (the capital city). Aimags are further subdivided into 330 soums (districts) and 1,613 baghs (small administrative

units). The capital city is divided into nine düüregs (districts) and 152 khoroods (subdistricts).

### Aimag level

There is an environment and tourism department in each aimag, responsible for ensuring the implementation and enforcement of environmental legislation and policies at aimag level. An example of the organizational structure of such a department is presented in figure 1.3.

The environment and tourism departments are in parallel subordination – to the Ministry of Environment and Tourism and to the government of the respective aimag. The head of department is appointed by the governor of the aimag in consultation with the Minister of Environment and Tourism and reports to both the governor and the Minister. The parallel subordination was implemented in 2012. Before that, the departments were financed by the Ministry. As of 2012, they are financed by the aimag government's budget. Currently, the head of department has more authority on the budget than they did previously, as he or she disburses the budget directly.

The functions of an environment and tourism department include: implementation of national environmental legislation and policies at aimag level, implementation of aimag policy documents, approval

of the general assessment under the Law on Environmental Impact Assessment, issuance of water permits, issuance of permits to replant trees from one place to another, issuance of authorizations for plant collection and herb harvesting, and participation in the approval of mining operations.

NAMEM has Departments of Meteorology, Hydrology and Environmental Monitoring in the aimags.

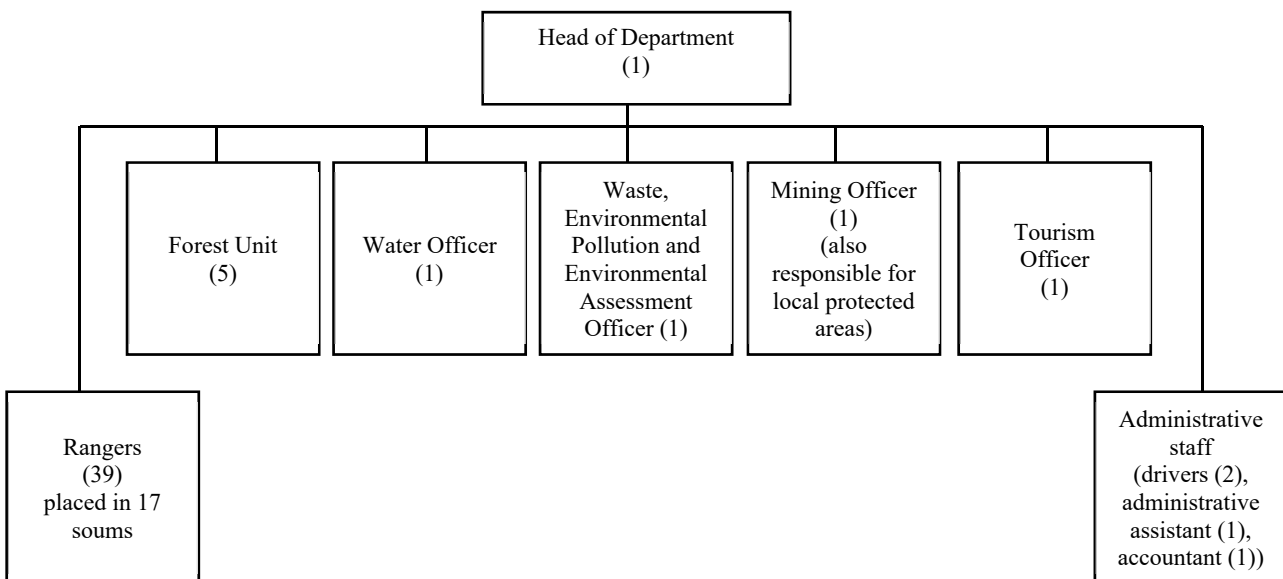
The aimag specialized inspection departments (branches of GASI) include environmental inspectors (about three per aimag) who are appointed by GASI upon consultation with the aimag governor. These inspectors report to GASI. The challenges faced by these environmental inspectors include poor equipment (vehicles) and low budgets for fuel.

In each aimag, there is a laboratory of NAMEM and a laboratory of GASI.

### Soum level

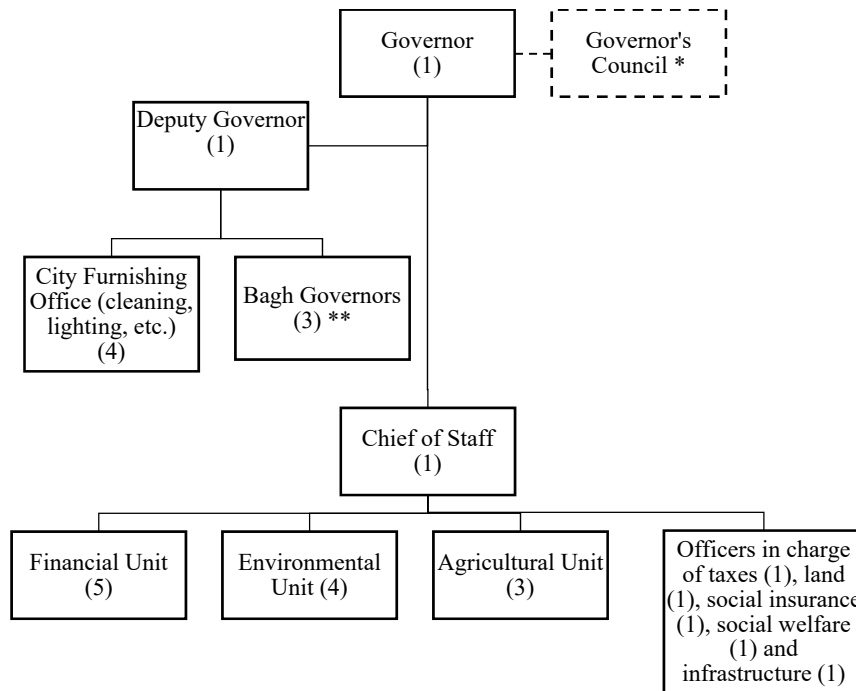
An example of the organizational structure of a soum governor's office is presented in figure 1.4. At soum level, the environment-related authorities commonly include an environmental inspector (one per soum) and several environmental rangers, which together constitute a soum's environmental unit.

**Figure 1.3: Organizational chart of the Environment and Tourism Department of Selenge Aimag**



Source: Environment and Tourism Department of Selenge Aimag, 2017.

Note: Number of staff is indicated in parentheses. Rangers report to both the Environment and Tourism Department and respective soum government.

**Figure 1.4: Organizational chart of the Governor's Office in Bayangol Soum of Selenge Aimag**

Source: Governor's Office in Bayangol Soum of Selenge Aimag, 2017.

Note: Number of staff is indicated in parentheses.

\* Governor's Council has six members (directors of each unit and bagh governors).

\*\* There are three baghs in Bayangol Soum of Selenge Aimag.

The existence of only one post of environmental inspector at soum level requires the inspectors to be professionals in everything. The soum's environmental inspector is certified by and receives professional guidance from GASI. Day-to-day instructions come from the soum's governor, to whom the environmental inspector reports. The governor signs an authorization for inspection. Not all soum inspectors have uniforms.

Environmental rangers support the environmental inspector on inspection-related issues. They are staff of the aimag's environment and tourism department and receive their salary from the aimag's government. They are appointed by the aimag's environment and tourism department in consultation with the soum's governor. Rangers report, in parallel, to the aimag's environment and tourism department and to the soum's governor. The number of rangers in a soum depends on the soum's territory. The environmental inspector has a supervisory role towards the environmental rangers.

Environmental inspectors and rangers at soum level are inadequately equipped. For example, three rangers in Bayangol Soum of Selenge Aimag are to share one motorbike. Rangers either use their private cars for official business, with the soum's budget paying for the fuel, or use vehicles provided by the governor's

office. The environmental inspector in the same soum has neither a car nor a motorbike.

Waste and other utilities in a soum are dealt with by utility companies, usually by one company for all utilities.

The soum governor's council advises the governor on various issues, including environmental issues. The governor's council may also provide advice on the agreements to be signed by the soum government with mining companies in order to protect the environment, create infrastructure for mining operations and create workplaces.

#### *Vertical coordination*

The vertical coordination between the environment and tourism departments at aimag level and the Ministry of Environment and Tourism is functioning reasonably well. For example, the environment and tourism departments at aimag level comment on draft laws and policies and collect comments from soum environmental units to be sent to the Ministry. This mechanism also functions for secondary legislation, although not all draft secondary legislation acts are submitted for consultation with the environment and tourism departments at aimag level and with soum environmental units.

The vertical coordination between GASI and the environmental inspectors of aimag specialized inspection departments at aimag level is functioning well. However, this is not always the case for GASI and the environmental inspectors at soum level.

#### *Horizontal coordination*

##### National level

A number of mechanisms for horizontal coordination on the environment and sustainable development exist at the national level. Interministerial committees or councils are often created to address issues that are within the competence of several ministries. However, few coordination bodies incorporate other stakeholders (NGOs, businesses, academia) along with governmental bodies, organizations and institutions. Little information about the activities of such bodies is made available to the public. The effective functioning of such bodies is impeded by the frequent changes of government requiring renewal of the composition of such bodies.

The National Council for Sustainable Development was established in 1994. It had regular meetings until around 2002–2004. There is evidence that, in 2012, an updated composition of the National Committee on Sustainable Development was approved (2012 Government Resolution No. 98). The latest renewal of the composition of the National Committee on Sustainable Development chaired by the Prime Minister took place in January 2017 (2017 Government Resolution No. 27, Annex 14).

The National Food Safety Council functions under the Prime Minister and includes representatives of the Ministry of Food, Agriculture and Light Industry, Agency for Standardization and Metrology, Mongolian Customs General Administration, Agency of Consumer Protection, GASI, etc.

The National Committee for Reducing Air Pollution was established under the President's Office in 2011. Later, due to the amendments in 2013 to the Law on Air, the Committee was moved to be under the leadership of the Prime Minister. Its composition was last renewed in March 2017. It includes representatives not only of the Government but also of civil society. The Committee has a plan of activities and holds regular meetings.

The National Water Committee is established in accordance with the 2012 Law on Water to coordinate intersectoral water issues, to ensure IWRM and to

oversee the implementation of the Water National Programme. It is headed by the Minister of Environment and Tourism and serviced by that Ministry. Its composition includes governmental representatives but no other stakeholders. The Committee holds meetings, the frequency of which depends on need. Its composition was last renewed in January 2017 (2017 Government Resolution No. 27, Annex 10).

Six thematic working groups (air; water, sanitation and hygiene; chemical safety; healthcare waste management; climate change; health impact assessment) were established in 2011 by the Joint Order of the Minister of Nature, Environment and Tourism and the Minister of Health (No. 32/A-28) to implement the declarations of the first and second Ministerial Regional Forum on Environment and Health in Southeast and East Asian Countries. Their composition was renewed in 2014.

The Law on Tourism also provides for the establishment of an interministerial council that would include, among others, representatives of the ministry responsible for environmental issues and of tourism NGOs. Such a council was set up but did not work actively. In February 2017 its composition was renewed but as of May 2017 the council has not yet met.

The Mongolia EITI Multistakeholders National Council is chaired by the Prime Minister. It brings together 10 State Great Khural and government representatives, 10 company representatives and 10 civil society representatives. During the period 2006–2016 the Council held 15 meetings. The Council oversees EITI implementation, which aims to ensure better accountability and to strengthen good governance in the extractive sector (mining, oil, gas) by disclosing the sector's revenue and contextual information to the public. The Council's agendas and meeting reports are publicly available.

The current stand of Mongolia vis-à-vis Target 17.14 of the 2030 Agenda for Sustainable Development is described in box 1.3.

##### Aimag and soum levels

The aimag and capital city sustainable development councils (also known as the aimag and capital city social, economic and environmental councils) were established in the mid-1990s but ceased to exist around 2004.





### Box 1.3: Target 17.14 of the 2030 Agenda for Sustainable Development

#### **Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development** **Target 17.14: Enhance policy coherence for sustainable development**

This target covers one of the systemic issues for the achievement of the SDGs. It addresses how the country works across policy sectors and coordinates the sectors to achieve joint objectives of sustainable development. It also addresses the extent to which policies in various sectors are coherent and aligned with sustainable development. The indicator agreed for Target 17.14 at the global level refers to the existence in countries of mechanisms to enhance policy coherence for sustainable development.

Mongolia has a number of mechanisms for horizontal coordination at the national level. Interministerial committees or councils are created to address issues of a cross-cutting and intersectoral nature. However, a few coordination bodies incorporate other stakeholders along with governmental bodies, organizations and institutions. Some bodies are formally established but do not meet regularly. For example, the National Committee on Sustainable Development under the Prime Minister, the composition of which was last renewed in January 2017, has not met as of November 2017.

There is a good level of coherence among policy documents in Mongolia. Policy documents are consistent in terms of goals, targets and objectives set and measures envisaged for their implementation. The establishment of the National Development Agency in 2016 should further contribute to enhancing policy coherence. However, the lack of practical implementation of SEA is a loophole in ensuring the coherence of sectoral policies with the overall policies on green development, environmental protection and sustainable development.

The current formal mechanisms for horizontal coordination at aimag and soum levels are the ad hoc working groups established to tackle a cross-cutting issue (e.g. forest fire prevention or firefighting). Such working groups bring together various governmental authorities.

In Selenge Aimag, the cooperation between the environmental inspectors at aimag level and the wildlife rangers of the PAA (responsible for the Suhbaatar National Park) is good and the responsibilities are delineated. Cooperation between the environmental inspectors at aimag level and NAMEM's Department of Meteorology, Hydrology and Environmental Monitoring is not intensive but the samples taken by the environmental inspectors at aimag level are sometimes tested in NAMEM's local laboratory (e.g. for mercury and particulate matter). The practice of the staff of the aimag's environmental and tourism department joining inspections conducted by the environmental inspectors at aimag level (sometimes also with the police) demonstrates the close cooperation between the department and the environmental inspectors at aimag level, though such practice may jeopardize the independence of inspectors.

The existence in each aimag of two laboratories doing similar analyses for different institutions (NAMEM and GASI) is questionable from the efficiency point of view.

## 1.6 Assessment, conclusions and recommendations

### *Assessment*

The country has a well-developed planning system defined by the 2015 Law on Development Policy Planning, with clear requirements for monitoring the implementation of development policy documents. Existing policy documents are well linked to each other and largely consistent in terms of goals, targets and objectives set. Governmental officials exhibit good knowledge of the policy documents.

Green development is a clear policy objective, enshrined in the key national visionary document, the 2016 Mongolia Sustainable Development Vision 2030, as well as in the specifically green-economy-oriented 2014 Green Development Policy. A weak point of the planning system, especially from the environmental perspective, is the non-application of the SEA tool for evaluation of environmental impacts of future sectoral policies.

Mongolia is well on track with the work on implementation and monitoring of the SDGs. The Government has designed the 2016 Mongolia Sustainable Development Vision 2030 as a framework policy document for implementation of the SDGs. It has assessed the availability of indicators. High levels of ownership of the SDGs among governmental officials is an important achievement. However, the institutional framework for coordination of SDGs

implementation and monitoring still needs to be operationalized.

Since 1987, Mongolia has developed an extensive legal framework on environmental protection. The environmental legislation has developed in a stable way and is largely consistent and coherent. Integration of environmental requirements into sectoral legislation is taking place and there are opportunities to further strengthen such integration on the basis of the recently adopted 2014 Green Development Policy and 2016 Mongolia Sustainable Development Vision 2030. However, implementation of environmental legislation is often delayed, with delays occurring in particular in the development and adoption of subsidiary legislation. Furthermore, enforcement of environmental laws and environment-related provisions in sectoral legislation often represents a serious challenge.

The stability of the national environmental authority, in particular its functioning since 1987 at the ministerial level, has been a positive factor for consistent development and implementation of environmental policies and legislation, and has facilitated the integration of environmental considerations into sectoral policies and legislation. One of the key issues, however, is staff turnover due to frequent changes of government. Vertical coordination between the environment and tourism departments at aimag level and the Ministry of Environment and Tourism is functioning reasonably well.

The establishment of GASI in 2003 has allowed the separation of the policymaking and regulatory function from the control and enforcement function. Positive outcomes of the new system include more efficient use of resources and strengthening of the links between thematic inspectors. However, the insufficient level of cooperation between GASI and the Ministry of Environment and Tourism is a weak link in the new system.

### *Conclusions and recommendations*

#### Implementation and monitoring of the SDGs

The National Development Agency (NDA) is entrusted to coordinate the work on SDGs implementation and monitoring. The National Committee on Sustainable Development under the Prime Minister is envisaged to be a high-level political body to guide the national efforts towards achievement of the SDGs in the context of the 2030 Agenda for Sustainable Development. The composition of the Committee was last renewed in

January 2017; however, as of November 2017, the renewed Committee has never met. In the State Great Khural, under the Standing Committee on Social Policy, Education, Culture and Science there is a Subcommittee on the SDGs, the members of which are parliamentarians.

The Government undertook an assessment of the availability of globally defined indicators, which showed that 157 indicators are not available in the country. The Government is still in the process of defining the national targets and indicators. Some national targets are included in the 2016 Mongolia Sustainable Development Vision 2030, but others are still to be formulated and mainstreamed into sectoral policies.

Governmental authorities, including sectoral ministries and public institutions, demonstrate an impressive awareness of the SDGs, which is not yet the case with non-governmental stakeholders.

#### Recommendation 1.1:

*The Government should:*

- (a) *Operationalize the National SDG Committee under the Prime Minister;*
- (b) *Proceed with setting up aspirational and measurable national targets;*
- (c) *Ensure that SDGs are integrated into future subnational development policy documents, and in future sectoral policy documents by aligning the national sectoral policy objectives with the SDGs;*
- (d) *Seek guidance from the international organizations and institutions on enhancing the availability of data for SDG indicators and promote the sharing of experience with other countries on this issue;*
- (e) *Continue raising awareness on the SDGs with an emphasis on non-governmental stakeholders and with particular focus on local communities;*
- (f) *Ensure the regular preparation of reports on SDGs implementation.*

#### Strategic environmental assessment

The 2012 Law on Environmental Impact Assessment made SEA mandatory for national, regional and sectoral policies, and development programmes and plans, which may have an adverse impact on the environment, society and human health. In 2013–2014, subsidiary legislation on SEA was adopted. However, as of mid-2017, no SEA has ever been done. Although some training was conducted by the Ministry of Environment and Tourism, understanding of the SEA instrument among the line ministries is

poor. The lack of SEA of sectoral policies, programmes and plans prevents the systematic, coherent and comprehensive integration of environmental measures and requirements into sectoral policies. No responsibility for failure to initiate and conduct an SEA is envisaged by the Law. Neither the Law, nor subsidiary legislation specifically define the sectors in which policies, programmes and plans are subject to SEA. The Law does not provide for the participation of affected countries and the public in affected countries in SEA procedure.

Recommendation 1.2:

*The Government should:*

- (a) *Ensure that SEA is conducted for all national, regional and sectoral policies, and development programmes and plans, in accordance with the requirements of the 2012 Law on Environmental Impact Assessment;*
- (b) *Conduct training to raise awareness about SEA among the line ministries;*
- (c) *Develop a list of sectors in which policies, programmes and plans are subject to SEA, taking into account available international practice;*
- (d) *Revise legislation in order to provide opportunities for the participation of affected countries and the public in affected countries in the SEA procedure.*

Horizontal coordination

A number of mechanisms for horizontal coordination on the environment and sustainable development exist at the national level, e.g. the National Committee for Reducing Air Pollution and National Water Committee. Interministerial committees or councils are often created to address issues within the competence of several ministries. However, few coordination bodies incorporate other stakeholders (NGOs, businesses, academia) along with governmental bodies, organizations and institutions. Little information about the activities of such bodies is made available to the public. The effective functioning of such bodies is impeded by the frequent changes of government, requiring renewal of the composition of such bodies. As a result, some bodies do not hold regular meetings. Strengthening the mechanisms for horizontal coordination on the environment and sustainable development is crucial for achievement by Mongolia of Target 17.14 (Enhance policy coherence for sustainable development) of the 2030 Agenda for Sustainable Development.

Recommendation 1.3:

*The Government should strengthen horizontal coordination on environment and sustainable development by:*

- (a) *Reviewing the approach to the composition of interministerial committees and councils in order to base their membership on functional titles;*
- (b) *Ensuring regular meetings of interministerial committees and councils;*
- (c) *Making meeting reports of such interministerial committees and councils publicly available;*
- (d) *Increasing stakeholder participation in such interministerial committees and councils.*

Legal and policy framework for the mining sector

In recent years, the Government made efforts to integrate environmental requirements into the legal and policy framework on mining. The 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas and the 2014 amendments to the Law on Minerals represent positive steps in the direction of decreasing the environmental impact of mining and making mining better serve the interests of local people. The Regulation on Extraction of Minerals from Small-scale Mines provided the legal framework for artisanal and small-scale mining in permitted sites and was replaced with an improved version (2017 Government Resolution No. 151) that places a stronger focus on environmental rehabilitation of land after artisanal mining activities.

Nevertheless, there are still a number of deficiencies. The EIA is conducted late in the permitting process – after the issuance of the special mining licence, though before the issuance of the permit to start mining operations. The mandatory agreements between mining companies and local authorities in order to protect the environment, create infrastructure for mining operations and create workplaces are not publicly disclosed and there are concerns about the selection of priorities in such agreements. The technical requirements of the Regulation on Extraction of Minerals from Small-scale Mines (such as the limits on the area to be used by cooperatives and limitations on the number of areas within the territory of one soum) make the functioning of cooperatives of artisanal miners difficult. Implementation of legislation on the restoration of land affected by mining represents a huge challenge.

The current policy documents focus on establishing a favourable investment environment for the mining

sector, improving Mongolia's competitiveness in the international minerals market and creating a national processing industry for mined products. The environmental focus of the current policy documents related to mining is less pronounced. There is no policy document that would specifically address the abandoned and damaged mining areas and their rehabilitation. There is no policy document that would specifically target the creation of opportunities for artisanal miners to switch to other areas of employment.

Recommendation 1.4:

*The Government should:*

- (a) *Improve the mechanism of agreements between mining companies and local authorities and increase its transparency;*
- (b) *Revise the permitting process in the mining sector to ensure that outcomes of EIA are meaningfully taken into account;*
- (c) *Ensure meaningful participation of stakeholders in decision-making process on mining projects;*
- (d) *Revise the legal framework for artisanal and small-scale mining in order to ease the establishment and operation of artisanal miners' cooperatives;*
- (e) *Develop policies to create opportunities for artisanal miners to switch to other areas of employment;*
- (f) *Develop an action plan on rehabilitation of abandoned and damaged mining areas;*
- (g) *Ensure systematic data collection and assessment of impacts of the mining sector on the environment.*

Environmental inspection authorities

The General Agency for Specialized Inspection (GASI) under the Prime Minister was established in 2003 as an independent agency bringing together various thematic inspections, including environmental inspection. The environmental inspectors at aimag level are appointed by GASI upon consultation with

the aimag governor. They receive instructions from and report to GASI. However the environmental inspectors at soum level are not subordinated to GASI. The environmental inspectors at soum level are appointed by the soum governor, are paid from the soum government's budget and report to the soum governor (and to the relevant aimag specialized inspection department). The dependency of soum environmental inspectors on soum governors is a clear drawback of the current system.

Recommendation 1.5:

*The Government should ensure the independence of environmental inspectors at soum level by:*

- (a) *Making appointment and dismissal of environmental inspectors at soum level be by GASI upon consultation with the soum governor;*
- (b) *Bringing environmental inspectors at soum level under the payroll of GASI;*
- (c) *Enhancing the reporting by environmental inspectors at soum level to GASI.*

Institutional memory

One of the key issues for the Ministry of Environment and Tourism is staff turnover. In recent years, due to frequent changes of government (on average, every 18 months), most staff at both senior (minister, vice-minister, state secretary) and managerial (heads of departments and divisions) levels were replaced with every change of government, impeding the consistent development and implementation of policies on the environment and green development and destabilizing the institutional memory of the organization.

Recommendation 1.6:

*The Ministry of Environment and Tourism should give the opportunity to its staff to build experience in their specialization while remaining in their post, and establish institutional operational memory by creating an information system containing existing and archived data and information.*



## Chapter 2

# REGULATORY AND COMPLIANCE ASSURANCE MECHANISMS

### 2.1 Permitting and licensing

The country's permitting and licensing system is continuing to evolve, bringing in additional environmental media and additional pollutant sources and environmentally damaging activities.

Licences are required for the import, sale or export of ODS; the production of dangerous or toxic chemicals during manufacturing; the emission into the atmosphere of polluting substances not covered by existing standards; engaging in preparing a detailed EIA report; the import, selling or export of dangerous or toxic chemicals; plant protection products; the exploration or mining of minerals; and oil production. Licences are also needed for the use of radiation sources.

Permits are required for, among other things: the use of water; the discharge of wastewater (not in effect); the drilling of a borehole or the digging of a well or channel; air pollution by certain sources (not in effect); the operation of waste disposal sites, landfills and recovery activities; the collection, transportation, recycling, disposal and export of hazardous waste; the export, import, transboundary movement, use, trade, production and disposal of hazardous and toxic substances; the use of flora and animal resources; and the carrying out of activities that use natural resources and have been subject to EIA.

No integrated pollution prevention and control mechanism that would resemble that provided under EU Directive 2008/1/EC concerning integrated pollution prevention and control (the IPPC Directive) is in place.

#### *Mineral resources*

Licences for mineral resources are issued by the Ministry of Mining and Heavy Industry and a subordinate body, the Mineral Resources and Petroleum Authority. Licensing is in accordance with the 2006 Law on Minerals. The Ministry staff see their mission as being to promote responsible and transparent mining. The Ministry is responsible for the issuance of mineral, oil and gas exploration licences and mining (exploitation) licences and the execution

of production-sharing agreements. The Mineral Resources and Petroleum Authority, on behalf of the Ministry, issues exploration licences for an initial period of three years with up to three extensions of three years each. The Authority also issues special (i.e. exploitation) licences.

A technical and economic feasibility study is prepared for a mining area, with the support of professional specialists, for approval by the Ministry of Mining and Heavy Industry. The Ministry of Mining and Heavy Industry has a special commission to review the feasibility study. This commission is comprised of government specialists including from the Ministry of Mining and Heavy Industry, the Ministry of Environment and Tourism, the Ministry of Finance, the Mineral Resources and Petroleum Authority, the National Association of Mining, the Mongolia University of Science and Technology and the Mining Professional Union.

First, an environmental baseline study is carried out. Then the feasibility study is approved, followed by the general EIA conducted by the Ministry of Environment and Tourism. Following the conclusions of the general EIA, a detailed EIA is prepared, if deemed necessary. The Ministry of Environment and Tourism has a Professional Council to review the quality of the detailed EIA. The detailed EIA includes the environmental management plan (EMP). No company can operate without an EIA. In a way, the "permit documentation" for a mining activity in Mongolia includes an exploitation licence, a detailed EIA and an EMP.

According to the Law on Minerals, in 2010, the Ministry established a Computerized Mining Cadastre System of Mongolia. In 2014, the System was extended to include a dedicated web portal. This cadastre provides public access to the processes of issuing and reissuing of licences, licence revocation, transfer, pledge and surrender for the entire or a part of the licensed area, as well as to maintaining a register of licences. One of the main objectives of this tool is to prevent licences from overlapping other licences or protected areas. This functionality is provided to registered users.

Extractive Industries Transparency Initiative*Air*

In 2006, the Government approved adherence to the EITI through Government Resolution No. 1. Government Resolutions No. 80 of 2007 and No. 222 of 2012 defined functions, responsibilities and tasks assigned to central and local administrative bodies in relation to the EITI. An online reporting mechanism was introduced in 2015 (<http://e-reporting.eitimongolia.mn>).

As of 17 January 2017, the EITI reporting system revealed 3,864 mining licences (including for exploration and exploitation of minerals, oil and gas) among 2,256 licence holders, covering 8.78 per cent of the territory of Mongolia. On 29 May 2017, the Computerized Mining Cadastre System of Mongolia identified 2,164 exploration licences and 1,592 exploitation licences (i.e. 3,756 mining licences), covering 6.21 per cent and 0.90 per cent of the area respectively. These coverage percentages may be compared with the over 30 per cent of land covered by exploration licences in 2008 and the current aim of raising it again to 20 per cent. The Ministry estimates that about 30 per cent of the licensed area is being used, with the remainder idle because of low commodity prices, poor infrastructure or the risk of environmental impact. The number of licences for oil and gas and radioactive minerals is two orders of magnitude lower.

Information held by the Ministry of Mining and Heavy Industry and the Ministry of Environment and Tourism is not being released in full to the EITI (box 2.1), so undermining the Government's commitment to the EITI and undermining the aspiration of the Ministry of Mining and Heavy Industry to foster responsible and transparent mining.

The revised 2012 Law on Air empowers the soum and district governors to issue permits that allow the use of major stationary sources of air pollution (such as CHP, heat-only boilers, and industry) and to establish permissible emission levels. Such permits are issued by soum and district governors based on the conclusions of NAMEM's departments at local level. A national emission standard has been adopted for thermal power plants (MNS 6298:2011). In practice, the Ministry of Environment and Tourism does not issue permits for air pollution and payments for emission of air pollutants are not paid by major emission sources, such as thermal power plants, given that appropriate instruments for measuring and monitoring the emissions are lacking (chapter 3).

*Water and wastewater*

According to the 2012 Law on Water, a permit is required by a water user. For drilling a borehole or digging a well or channel, the prospective water user must submit an application to the aimag (or capital city) environmental authority, which registers the well or borehole and issues the permit.

Which organizations constitute the responsible authorities for permission to use water depends on the volume to be used for the purpose of energy, water transportation and utilization (table 2.1); one exception is that, for a centralized domestic water supply, the responsible organization seeks the consent of the Ministry of Environment and Tourism and water use permission from the water basin administration.

**Box 2.1: The Extractive Industries Transparency Initiative in Mongolia**

EITI Mongolia produces an annual report using international and national audit firms to reconcile reported payments made by licence holders and government receipts. In January 2017, EITI Mongolia passed its international validation but was given one year to satisfy certain requirements that were deemed unsatisfactory, notably on data quality and assurance. Nonetheless, EITI Mongolia is an important and independent source of information and provides a degree of transparency in a sector in which public confidence is lacking.

The EITI reporting system reveals much information, including financial information on licence holders. However, it does not include information on when licences are applied for (while providing the date of issue), nor on the reasons for and conditions on the numerous licence transfers. There is also a problem at present with accessing the area covered by petroleum licences in the Ministry of Mining and Heavy Industry database. In addition, the Ministry of Environment and Tourism is not providing the most recent data on receipts to its special fund for mining rehabilitation, arguing that this is not permitted by banking legislation. Further, though licence holders provide information to the EITI, they are often unwilling to present the same information on their own websites, thus reducing transparency. EITI Mongolia wished to connect its online reporting system to the online listing of EIA reports so as to advance transparency, but this has not yet been possible for technical reasons.

**Photo 2: Mining in Zaamar Soum****Table 2.1: Approval and permitting authorities for water use and wastewater permits**

	Approval authority	Permit authority
<b>Water use per day (m<sup>3</sup>)</b>		
Over 100	Ministry of Environment	Water basin administration
Between 50 and 100	Water basin administration	Provincial or capital city environmental authority
Less than 50	Provincial or capital city environmental authority	District governor
<b>Wastewater per day (m<sup>3</sup>)</b>		
Over 50	Ministry of Environment	Water basin administration
Less than 50	Water basin administration	District governor

Source: 2012 Law on Water.

The prospective water user is required to provide with its request, among other information: the location of the water source to be used; the amount of water to be used daily and its purpose; and, for water use exceeding 100 m<sup>3</sup> per day, EIA documents. Additional documentation is required in an application for mineral water use.

For withdrawals exceeding 100 m<sup>3</sup> per day, the Ministry of Environment and Tourism assesses available water resources, for example, to check whether there is a risk of groundwater depletion. The issuance of the permit itself, and the signing of a contract with the water user, is done by the State-owned enterprise, Mongol Us ("Mongolian Water"). In other instances, the contract is between the water

basin administration, the aimag authorities and the water user.

Water use permits are granted for 10 years (previously 15 years), with the right to an extension of five years if the user fulfils the contractual obligations; permits are reviewed every five years to reassess whether any changes are needed. In the case of the utilization of water for strategically important minerals, the duration of the water use permit is the same as for the exploitation licence.

The EIC website lists 49 water use permits, issued between May 2013 and October 2014, providing the water user name, the date of issue of the permit and a permit reference; no further information is available,



though the database has been designed to allow presentation of reports on actual water use and for information on wastewater, for example. A geographical information system interface ceases to function when asked to display water sources.

The Law on Water specifies a number of elements to be included in the water utilization contract, including measures to be taken to protect water resources and prevent water depletion and pollution. For water use over 50 m<sup>3</sup> per day, the water user's obligations include, in accordance with the Law on Environmental Protection, to install a water meter, employ a water utilization manager and obtain permission to remove wastewater and treat polluted water up to the standards (MNS 4943:2011 for Wastewater Discharge to Water Bodies; MNS 6561:2015 Water Quality. Effluent water for sewerage network. General requirements – which states the allowable limits of industrial wastewater discharged to sewers and central wastewater treatment systems).

A wastewater permit is required according to the Law on Water, but no secondary legislation has been adopted by the Government, so no permits are issued. Furthermore, fees are not collected as secondary legislation has not been developed for the 2012 Law on Water Pollution Fees. The Ministry of Environment and Tourism is now working on the secondary legislation. However, the Law also needs amendment and the draft law is under consultation with the other ministries; the amendment would reduce fee rates and introduce incentives for wastewater treatment. In principle, the water basin administration is responsible for issuing permits if the amount of wastewater exceeds 50 m<sup>3</sup> per day or the wastewater is contaminated with specific substances. For amounts less than 50 m<sup>3</sup> per day, the permit is supposed to be issued by the soum governor. Pollution fee rates are set for low-density substances, organic substances, minerals, heavy metals and toxic substances.

#### *Waste*

Under the revised 2017 Law on Waste Management, aimag and capital city governors give permission for operating a waste disposal site, landfilling and recovery activities and should approve a local regulation for this permitting. This permission to operate a waste disposal site covers household and industrial waste, but not hazardous waste.

Under the Law, the Ministry of Environment and Tourism gives permission, whether temporarily or not, to legal entities and organization for the collection, transportation, recycling, disposal and export of

hazardous waste. Permits, other than those of a temporary nature, are issued initially for a year, then extended by five years if the tasks are executed satisfactorily, and thereafter by 10 years. An expert committee on waste management in the Ministry issues assessments and recommendations to the Ministry related to issuance of such permission. The Ministry is also responsible for defining selection criteria for such legal entities and organizations. The Law on Waste Management also provides for the Ministry to permit the export of hazardous waste subject to a number of conditions.

The 2006 Law on Minerals requires that a mining licence holder include in the environmental protection plan for its operations the construction of tailings dams. There are no other targeted provisions on mining waste.

Waste is notably absent from the EIC databases (a label is present but no data).

#### *Hazardous substances*

In conformity with the 2006 Law on Toxic and Hazardous Chemicals, the Ministry of Environment and Tourism issues authorizations for the export, import, transboundary movement, use, trade, storage, production and disposal of hazardous and toxic substances. A 2009 Joint Order by the Minister of Environment and Minister of Foreign Affairs, No. 334/104, sets out the requirements for the issuance of permits in more detail, with certain activities, such as production, storage and sale, being subject to detailed EIA. Table 2.2 shows the number of such permits issued in the period 2008–2014; there would appear to be a gap in the data in 2011.

The Ministry of Environment and Tourism website provides a list of 170 permits issued in the first half of 2016 for the export, import, trade, use and sale of substances, indicating the total fees paid but only identifying the substance from the end of April; in many instances from May onwards, the individual substances are still not named but reference is made to a list (not available) of substances covered. Further counts of the number of permits, for slightly different periods but suggesting 164 new permits in the period January–September 2016, are provided on the same website, creating further confusion.

A 2017 Joint Order by the Deputy Prime Minister, the Minister of Environment and Tourism and the Minister of Health, No. 54/A/136/A/215, sets out the requirements for the storage, transportation, use and disposal of chemical waste.

**Table 2.2: Permits for hazardous and toxic substances, 2008–2014, number**

	2008	2009	2010	2011	2012	2013	2014	Total
Use	59	72	268	4	224	171	243	1 041
Export	0	0	1	0	1	10	6	18
Import	73	84	315	4	143	198	236	1 053
Sale	17	24	76	0	33	76	95	321
Production	0	1	5	0	4	6	3	19
Transboundary	0	0	3	0	0	1	0	4
Others	76	90	340	4	255	241	330	1 336

Source: Environmental Information Centre (<http://www.eic.mn/toxic/talicense.php>).

A list of hazardous and toxic substances is maintained jointly by the Ministry of Environment and Tourism and the Ministry of Health. The lists of import and export permits generally do not specify the substance being imported or exported; there may be security and safety reasons for not doing so but the public interest in transparency would seem to be greater.

A mining licence holder includes in the environmental protection plan for its operations the storage and control of toxic and potentially toxic substances and materials.

#### *Ozone-depleting substances*

The revised 2012 Law on Air requires licensing procedures for ODS. The 1999 Government Resolution No. 104 provides procedures for issuing licences for the import, manufacture, sale and use of ODS. Licences are issued by the Ministry of Environment and Tourism, with the opinions of the health and sanitary inspectors of GASI. There are no long-term publicly available data on ODS licences. The Ministry website provides a list of 206 licences issued in the first half of 2016 for the import of equipment containing ODS, primarily refrigerators, freezers and air conditioners; the list identifies the number of items licensed for import and the fees paid (which are per certificate, irrespective of the number of items). Further counts of the number of certificates, for slightly different periods but suggesting about 350 certificates in the period January–September 2016, are provided on the same website.

#### *Radiation protection and safety*

No data are publicly available on licences on the use of radiation sources.

#### *Fauna and flora*

Under the 1995 Law on Natural Flora, a permit for the use of extremely rare flora for research purposes is issued by the Ministry of Environment and Tourism; for such use of rare flora, the soum governor issues the

permit. In all instances of commercial use, an EIA must be carried out so that a licence may be issued by the soum governor, in the case of common flora, or by the Ministry for rare flora. A licence to export flora is issued by the Ministry.

Under the revised 2012 Law on Fauna, extremely rare fauna may be hunted or trapped only for scientific purposes and with special permission of the Ministry. For rare fauna, a permit is also issued by the Ministry for hunting and trapping for scientific, research, cultural, artistic or medicinal purposes, for regulating the number of fauna, or to private citizens on payment.

Under the revised 2012 Law on Fauna, citizens may hunt or trap other than rare animals for household purposes, having received a permit from the soum governor. Rare animals may be hunted or trapped subject to obtaining a special permit from the Ministry. More generally, the soum governor can issue a permit for the use and possession of fauna, as well as the use of extremely rare and rare fauna for scientific, cultural, artistic or aesthetic purposes. The export of live extremely rare fauna is subject to permission by the Ministry and in compliance with Mongolia's international obligations.

Applications for licences for the international sale of animals and plants listed in CITES or derivatives thereof are submitted to the national CITES Administrative Council, which makes a decision on the basis of a recommendation by the CITES Scientific Council.

In May 2017, the EIC website provided limited information on permits and licences regarding flora, issued in accordance with the Law on Natural Flora, with only 22 import and export permits listed; by August 2017, this number had increased to 409 for the period to June 2017. Despite this improvement in the period covered, no species information is included. Seventy-five permits were issued, all in the period 2014–2016, for use of flora but again not identifying the plant species. Further counts of the number of permits, for slightly different periods but suggesting

about 60 export, 20 import and 25 use certificates in the period January–September 2016, are provided on the Ministry website, creating further confusion.

In May 2017, EIC also provided limited information on permits and licences regarding fauna, listing two import licences and 102 export licences in the period 2011–2015; by August 2017, this number too had jumped to 233 for the period to July 2017. However, a database of permits for use of animal resources remained empty. Again, the import and export licences do not specify the species being imported or exported. In addition, the Ministry of Environment and Tourism website provides a separate list of 26 export licences (certificates) for the first half of 2016; this list is more comprehensive, providing the species and the fees paid. Further counts of the number of certificates, for slightly different periods but suggesting about 45 export certificates in the period January–September 2016, are provided on the same website, again creating further confusion.

In addition, the Ministry of Environment and Tourism website offers two lists of hunting licences in 2016, indicating the species and fees paid. The website also shows fishing licences issued in 2015 and 2016, indicating the fees paid. However, the licences are those issued to foreigners and tourism companies and their number is dwarfed by the far larger numbers of domestic hunters and fishers. Earlier estimates of hunting and export of wildlife, at the start of the 21st century, indicated a large proportion of the rural population engaged in hunting, tens of thousands of animals being traded and a commensurate decline in animal populations.

### *Forestry*

Under the revised 2012 Law on Forests, permits are required for a range of forest-related activities, including for the harvesting of timber and non-timber forest products (NTFPs), the transplantation of seedlings and the conduct of research in forests. Permits for cutting fuelwood are obtained from the local (soum) ranger. Local authorities issue licences to forest users groups, citizens, economic entities and organizations for the right to use forests and forest resources.

The EIC website is designed to present a list of certificates (certificates of origin, logging licences and log registers) issued by the Ministry of Environment and Tourism, aimags, the capital city and the special

protected areas, as well as of violations, but there are no data available.

### *Licensing of entities to undertake environment-related activities*

The legislation addresses the licensing of entities – or professional organizations – to undertake a variety of environment-related activities, e.g. preparation of a detailed EIA and environmental audit. Most of the entities licensed as professional organizations with respect to fauna organize hunting and fishing trips, whereas those licensed as water professional organizations are active regarding boreholes (drilling, equipment, maintenance). Over 800 private entities are licensed as "professional forestry organizations" to undertake pest control, thinning and reforestation and industrial logging activities (chapter 13).

The Ministry of Environment and Tourism is responsible for the authorization of licences to entities to undertake environment-related activities, including to professional forestry organizations. For entities applying to be licensed to undertake detailed EIA, the Professional Council on EIA examines the competence of the business entity that has applied for a detailed EIA licence, further to the requirement that a licensed entity has to focus its main activity on detailed EIA, and makes a recommendation to the Ministry. Licences are granted by the Ministry and are valid for three years.

Data on licence holders are summarized in the table 2.3; unfortunately, information is incomplete and sources are often contradictory.

The information on EIA professional organizations on the EIC website for the period 2006–2016 reveals the 147 licensed entities. The number of licences issued shot up in 2015 (figure 2.1) with the addition of many new, inexperienced organizations. The EIC listing does not distinguish between new and extended licences. Information on the Ministry website usefully distinguishes between them and provides information on fees paid.

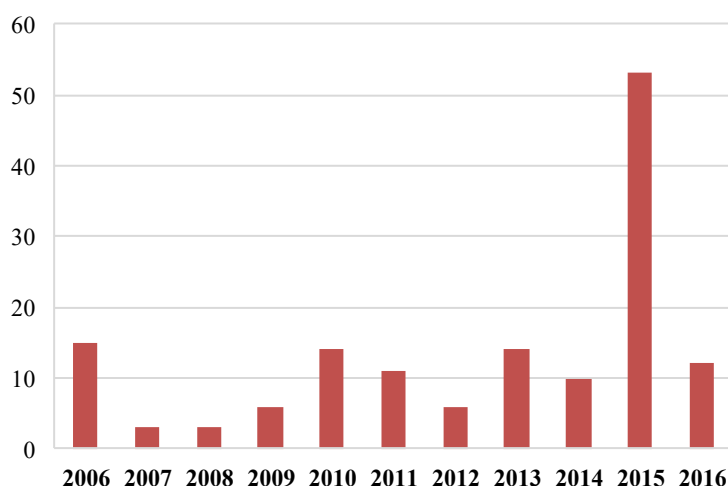
### *Public participation*

Public participation in permitting and licensing is not in place. There are no opportunities for the public to comment upon permit and licence applications and to be consulted on the conditions to be included in permits and licences. The involvement of citizens is indirect, i.e. through various representative bodies.

**Table 2.3: Professional organization licence holders**

	EIC website		Ministry of Environment and Tourism website	
	Number	Period (approx.)	Number	Period (approx.)
Flora	10/8 (2 lists)	2011–2014	19 new, 2 renewed	Jan–Sept 2016
Fauna	24/27 (2 lists)	2011–2014	10 new, 4 renewed	Jan–Sept 2016
Water	200	2011–2014	22 new, 1 renewed	February–May 2016
			19	Jan–Sept 2016
Geology	419	2011–2014	45 new, 16 renewed	Jan–Sept 2016
Forestry	447	2010–2014	118 new, 41 renewed	Jan–Sept 2016
			52	Oct 2013–Jun 2014
			93 new, 12 renewed	Feb–Jun 2016
Climate and environmental monitoring	1	2014		
Certified audit firm	11	2013–2014	6	Jan–Sept 2016
			23	undated
Auditor (individual)			164	2013–2015
Environmental specialist			71 new, 21 renewed	April–May 2016
Detailed EIA	147	2006–2016	19 new, 29 extended	Jan–Sept 2016
			7 new, 25 extended	March–May 2016
			193 valid	on 3 March 2016

Source: Environmental Information Centre and Ministry of Environment and Tourism websites, 2017.

**Figure 2.1: Newly licensed EIA professional organizations, 2006–2016, number**

Source: Environmental Information Centre (<http://www.eic.mn/eia/>).

#### *Information on permits and licences*

An important means of increasing transparency, while at the same time simplifying the work of authorities in evaluating available resources and thus whether additional permits may be issued, is to ensure that complete, consistent, coherent and up-to-date information is available on the EIC website. The EIC website is a valuable source of information on licences and permits and further information is available on the Ministry website. However, there are substantial differences between information on the EIC and Ministry websites. The two sets of data differ in terms of their scope, with EIC not including, for example,

species and substance data, fees paid and whether a permit is still valid or has been extended. Not all permits and licences are covered. The two websites also differ in terms of the periods covered, with the Ministry website generally providing shorter term, more recent data, and EIC not including up-to-date information.

In addition, the EIC website does not generally allow the download of data, a valuable means by which the public may view and analyse data, but also one that would allow the Ministry to extract policy- and management-relevant statistics.

## 2.2 Environmental impact assessment, including public participation

### Overview

EIA has its origins in Mongolia in 1987 when the ministry responsible for environmental issues was established and the system of environmental expertise, similar to the one used in the Soviet Union, was introduced. Environmental expertise, in its original form, had numerous weaknesses, including that it was a pro forma technical exercise that excluded the public except in the unlikely case that the public was able to undertake its own parallel expertise. That system was replaced in Mongolia in 1995 by EIA, which was further elaborated in 1998, revised in 2001 and much strengthened in 2012 in a revised 2012 Law on Environmental Impact Assessment.

The current legislation defines four forms of environmental assessment: SEA of policies, programmes and plans (chapter 1); environmental baseline assessment (or baseline study) to establish existing conditions and the state of nature and the environment of a territory in which a project, programme or plan is to be implemented; cumulative impact assessment of a collection of projects planned in a particular area or water basin; and general and detailed EIA of a project. In 2016, health impact assessment was introduced by revision of the 2012 Law on Hygiene and by reference to the Law on Environmental Impact Assessment.

The scope of the Law on Environmental Impact Assessment is very broad, as it covers any new, renovated or expanded activity that uses natural resources and is of a type listed in an annex to the Law, irrespective of its magnitude. For example, the types listed include light industry, petrol stations, green spaces and parks. Quantitative thresholds are used only to distinguish responsibility between national and local authorities (e.g. hotel capacity being more or less than 50 beds and power plants of more or less than 1 MW capacity).

The Law on Environmental Impact Assessment established a Professional Council on EIA within the Ministry of Environment and Tourism to review the reports and recommendations generated by SEA, cumulative impact assessment and detailed EIA. The Council meets at least once per month to discuss detailed EIA reports and issue conclusions. Meeting reports are meant to be on the Ministry's website but were not accessible.

### General Environmental Impact Assessment

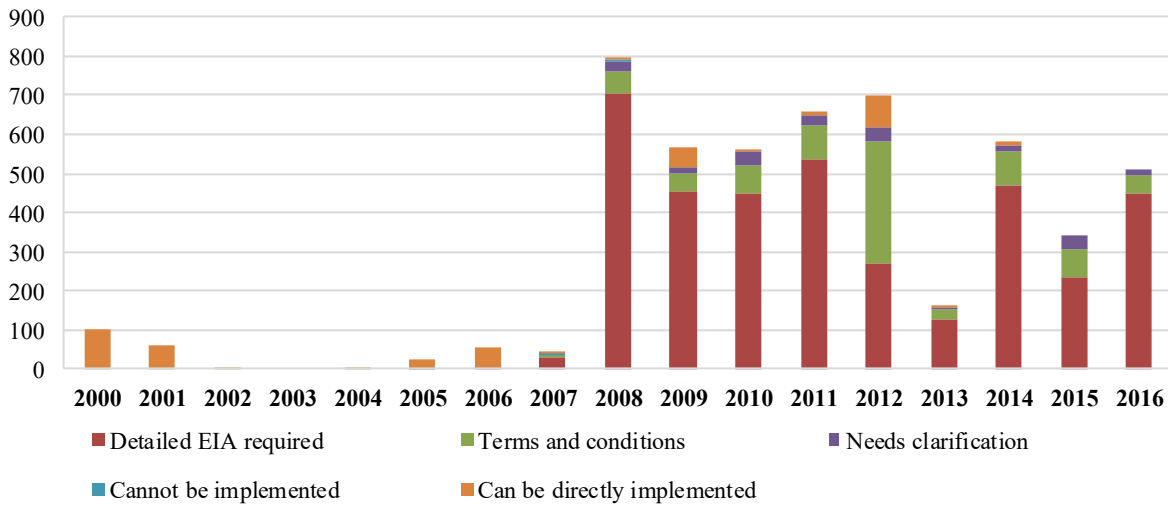
A general EIA – a screening and scoping mechanism – is carried out by the Ministry of Environment and Tourism or the aimag or capital city governor's office (environment and tourism department), depending on the list in the annex to the Law on Environmental Impact Assessment. The absence of screening criteria or thresholds for all project types increases the workload of all concerned. Numerical threshold magnitudes of planned activities would allow more rapid determination that smaller projects do not need detailed EIA. The absence of screening criteria or thresholds also creates uncertainty as to which authority is responsible.

The project implementer has to apply for a general EIA by providing a brief description of the project, a technical and economic feasibility study, working drawings, a baseline environmental assessment, the written opinion of the relevant soum governor and other related documents. An assessment expert appointed by the relevant authority has 14 working days (with the possibility of one extension of 14 days) to evaluate the documentation and provide their formal opinion as to which of the following outcomes applies:

- The project should not be permitted and is rejected on the grounds that it is likely to cause considerable harm to the environment by virtue of its proposed technology, technique and activities; that it is absent from land management plans; or that its activities are inconsistent with state policy, the outcomes of an SEA or relevant legislation.
- The project may be implemented without a detailed EIA but subject to specific conditions.
- The project requires detailed EIA, in which case the objectives, areas, scope and duration of the work for the detailed EIA are specified.

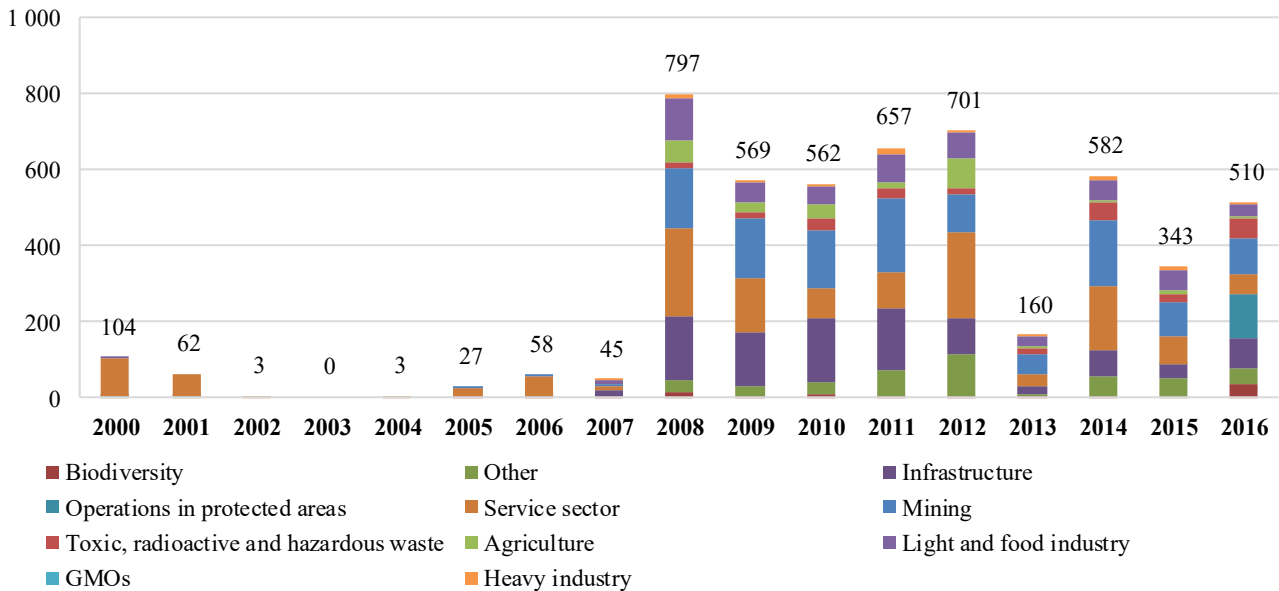
Figure 2.2 shows the number of general EIAs issued and the number of each of the possible outcomes, grouped by year of decision, with different conclusions being possible prior to 2012 (notably, permission to implement directly, without a detailed EIA and without conditions). The data do not reveal what ultimately happens to those projects for which clarification is needed (representing approximately 4 per cent of all projects that have undergone general EIA) and whether these projects have, in effect, been rejected. Figure 2.3 shows the number of general EIAs by type of planned activity.

**Figure 2.2: General EIAs issued by conclusion, 2000–2016, number**



Source: Environmental Information Centre, 2017.

**Figure 2.3: General EIAs issued by project type, 2000–2016, number**



Source: Environmental Information Centre, 2017.

*Detailed Environmental Impact Assessment*

A detailed EIA is carried out by an authorized entity on behalf (and at the cost) of the project implementer. The detailed EIA includes an environmental management plan (EMP), consisting of an environmental protection plan and a monitoring programme, as well as a number of elements such as: a risk assessment if required on the opinion on the general EIA; a description of mine closure activities, objectives, scope and indicators of restoration measures and details of ex-situ conservation measures for petroleum, mining and radioactive minerals projects; and a record of consultations made with the local authority and community likely to be affected by

the proposed project. In addition, procedural guidelines adopted in 2014 (Ministerial Order No. A-117) require the consideration of alternatives, one of the most important elements in preparing EIA documentation.

The assessment expert, appointed by the relevant authority that carried out the earlier general EIA, has 18 working days to appraise the quality of the detailed EIA. If necessary, the chief assessment expert of the Ministry may appoint a team of assessment experts to do an appraisal of the detailed EIA report; s/he may also extend the appraisal period once by 18 days. The Ministry decides whether the project should go ahead based on the detailed EIA report and the opinions of

the assessment expert and the Professional Council who have appraised the quality of the report.

The number of entities licensed to undertake a detailed EIA, further to the Law on Environmental Impact Assessment, is high, at about 200. In the period 2012–2016, there have been, on average, 211 detailed EIA reports each year (figure 2.4). Many of the entities are unlikely to conduct an EIA in a given year and cannot therefore be considered experienced. In contrast, the Law on Environmental Impact Assessment requires that an entity licensed to conduct detailed EIA focus its main activity on conducting detailed EIAs. In addition, there is a common perception that EIAs are frequently "copied and pasted" and that the quality of assessment is inadequate; the procedure is seen as a hurdle, not an opportunity to improve projects and their sustainability and efficiency. This leads to the conclusion that the criteria or method for licensing needs improvement or that more thorough evaluation of the quality of EIAs is needed, which is not possible with the current staffing resources.

#### *Environmental management plan*

The authority that performed the earlier general EIA approves the EMP for the proposed project and grants the permit to go ahead with the project. Further requirements regarding the EMP are set out in the Law on Environmental Impact Assessment, including the deposit of a guarantee for implementation of the EMP. The deposit is made into an account opened by the Ministry of Environment and Tourism in the case of mining, smelting and processing of minerals and chemical and coke-chemicals production (this is the fund referred to above regarding the EITI); for other projects the deposit is placed in an account opened by the soum governor's office.

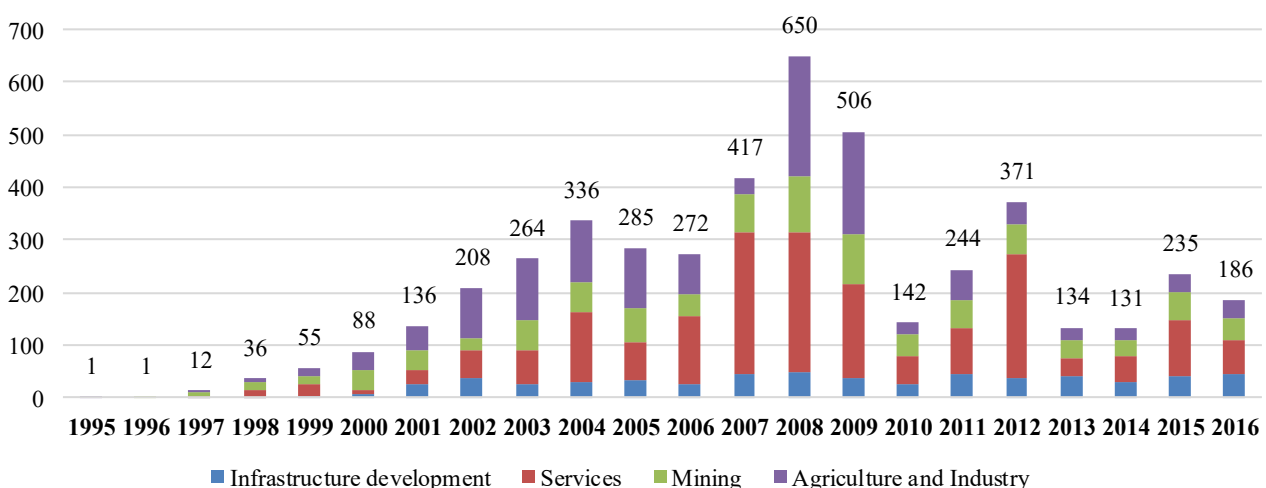
Every year, before the year begins, the licence holder submits an annual workplan, including EMP, to the Ministry of Mining and Heavy Industry. The EMP also goes to the Ministry of Environment and Tourism. When the year ends, the licence holder submits an annual report on actual activities, including for EMP implementation.

#### Approaches to land rehabilitation as part of biodiversity offsetting

Rehabilitation is an important element of an EMP, particularly in relation to mining. The question of biodiversity offsets and rehabilitation of alternative land has received much attention over the years. The revised Law on Environmental Impact Assessment provides for such an approach, where it is not possible to rehabilitate degraded land fully, as is commonly the case after mining activities.

The opinions about how biodiversity offsetting and alternative land rehabilitation actually work differ among governmental officials and international and local NGOs and activists. According to the latter, this approach brings new opportunities for abuse, such as the exploration and exploitation of resources in these alternative areas, or where an entity decides that it is cheaper to rehabilitate an alternative site rather than the area it has degraded, even if that would be preferable and feasible. NGOs report a lot of confusion over the implementation procedures for biodiversity offsetting and the lack of capacity among local authorities to monitor the implementation of offsetting projects. The Ministry of Environment and Tourism recognizes that guidelines or procedures for biodiversity offsetting and rehabilitation of alternative land are still insufficient.

**Figure 2.4: Detailed EIA by sector, 1995–2016**



Source: Environmental Information Centre, 2017.

### *Public participation*

Public participation is provided for in the Law on Environmental Impact Assessment and in the required procedures for public participation in EIA approved by the Minister of Environment and Green Development (Order No. A-03 of 2014).

At the general EIA stage, the local authorities at the aimag or capital city level must make information available to the local public. The general EIA procedure explicitly requires the written opinion of the relevant soum governor. However, the procedure of general EIA has to be completed within 14 days (which can be extended by 14 days).

At the detailed EIA stage, while drafting the EIA report, the entity performing the assessment has to organize consultations with and formally seek comments from the local authority, the community that is likely to be affected by the project and local residents living in the area where the proposed project is going to be implemented. The EIA report includes a record of the consultations. Here the opportunities for public participation are more generous, with up to 30 working days for members of public to comment in writing or verbally (Law on Environmental Impact Assessment). The procedures for public participation require that there be a focus on livelihood and social issues, participatory assessment methods be applied (without further precision) and a public meeting (or public hearing) be held.

The methodological guidelines on EIA (2014 Ministerial Order No. A-117) require that a non-technical summary be included using a style of language that is accessible to the general public. However, it is not required that the summary be issued separately in a format that would attract public interest. The public is generally presented with a very large and impenetrable tome, though there are good-practice exceptions. In addition, the Law on Environmental Impact Assessment requires that certain technical, technological and business-related information be kept confidential by the entity carrying out the EIA and this provision is reportedly applied broadly by some developers.

In addition, despite the good intention of the procedures to maintain a focus on livelihood and social issues in EIA, the impacts on livelihoods, notably in rural areas around mining sites, are of particular concern. There are frequent reports that affected people, having land use or possession rather than ownership, are not provided with technically and economically feasible resettlement alternatives when affected by economic development that has been

subject to a detailed EIA procedure, especially where the impact has been indirect or induced by the development and people have not been recognized as being affected.

Once completed, the detailed EIA report and the comments received have to be submitted to the bagh meeting within 15 days. Generally, the bagh meets approximately monthly, though it may meet less frequently in rural areas in the winter. Public consultation must also continue during the first year of operation.

The EIA report, including the EMP, should be posted on the public websites of the companies (project implementers), governor's offices of soums, districts, baghs and khoros and environmental departments of aimags and cities according to the procedures for public participation. However, no full EIA reports were to be found on the EIC or other local authorities' websites; they are held in the Ministry's archive and may be accessed upon request. They are too large to provide online.

### *Transboundary context*

Mongolia does not have a legal framework for EIA in a transboundary context.

Mongolian experts have participated in meetings under the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). Mongolian experts have also participated in the past in events organized by the Korean Environment Institute (Republic of Korea) regarding transboundary EIA.

The National University of Mongolia worked with institutions in the Republic of Korea to carry out a pilot transboundary EIA exercise in 2014 of the railway from Tavan Tolgoi (mining area) to Gashuun Sukhait (border crossing to China).

Major new development activities that might have significant transboundary impact, such as those affecting transboundary watercourses, involving bulk mineral resources to be exported by road or rail, or in the framework of the Belt and Road Initiative, would benefit from the application of transboundary EIA.

### *Cumulative impact assessment*

Cumulative impact assessment is a novelty introduced by the revised 2012 Law on Environmental Impact Assessment. The procedure is described in more detail in the Regulation on strategic environmental assessment, cumulative impact assessment and



environmental impact assessment, approved by the 2013 Government Resolution No. 374. Cumulative impact assessment is to be conducted by the Ministry of Environment and Tourism for a collection of projects planned in a particular area or water basin in order to analyse their combined effects on the environment and human health. The report of a cumulative impact assessment has to address the intensity, magnitude and distribution of cumulative impacts, measures that may reduce cumulative impacts, estimated costs and options and estimated damage to the environment, society and human health due to cumulative impacts. Public consultations are part of the cumulative impact assessment procedure.

Practical application of the cumulative impact assessment procedure has been limited. As of mid-2017, two procedures had been conducted.

### 2.3 Environmental standards

The Mongolian Agency for Standardization and Metrology has approved about 370 standards relating to the environment. Mongolian National Standards (MNSs) are freely available online. Standard setting is open to all those interested, including the public. The development of new standards is announced on the Agency website. A biennial plan for standard setting is developed jointly with ministries.

Each standard may have a mandatory and a selective (voluntary) use. The 2003 Law on Standardization and Conformity Assessment (invalid since 21 December 2017) specifies that standards relating to products that have an impact on public safety are mandatory. Various sectoral laws refer to standards; e.g. the 1995 Law on Environmental Protection indicates that certain standards are to be set, specifically on the permissible amounts or levels of: toxic and biological chemicals in the air, water and soil; noise, sound, vibrations, electric and magnetic pulses and other adverse environmental impacts; radiation; and chemicals in food products. Sectoral ministries are responsible for ensuring compliance with standards and for developing capacity in their application.

Emissions standards include the Thermal Power Plant Emission Guidelines (MNS 6298:2011) and the standard for Wastewater Discharge to Water Bodies (MNS 4943:2011). Another standard sets allowable limits of industrial wastewater composition before letting effluents into the public sewers and central wastewater treatment systems (MNS 6561:2015 Water Quality. Effluent water for sewerage network. General requirements).

No noise emission standard has been adopted, though MNS 0017-5-1-21-1992 sets standards for vehicle noise definition, measurement and tolerance.

Ambient environmental standards, including those for occupational safety, include:

- Ambient Air Quality Standard MNS 4585:2016 (applies to urban and indoor air pollution);
- Water Quality Standard MNS 4586:1998;
- Drinking Quality Standard MNS 0900:2005;
- Maximum Permissible Level for Groundwater Polluting Substances MNS 6148:2010;
- Soil Quality Standard MNS 5850:2008;
- Urban Soil Sanitary Standard MNS 3297:1991;
- Workplace Atmospheres. Hygienic requirements MNS 0012-013:1991;
- Standard for Noise Levels in Residential and Civil Construction MNS 0012-1-009:1985;
- Occupational Safety and Health. Workplace environment, hygiene requirements MNS 4990:2015 (includes presence of toxic substances in the workplace, for example);
- Occupational Safety and Health. General requirements for noise and safety MNS 5002:2000.

The Agency has also approved standards for toys since 2011, and food and construction materials. In particular, the Government is trying to maximize the domestic production of construction materials. Imports represent about 40 per cent of construction materials used and are perceived as being of low quality. Among the programmes established to support localization of production has been an EU-funded SWITCH-Asia Network Facility project that has piloted production of building blocks using fly ash from power plants. The project was executed in cooperation with the Agency with a view to the development of standards for fly ash construction materials.

Two selective standards on eco-labelling (Environmental Labels and Declarations MNS ISO 14021:2001 and MNS ISO TR 14025-2001) have been approved. A standard on corporate social responsibility (MNS ISO 26000:2012) has also been approved, though the practice is highly variable.

More than 30 environmental laboratories under NAMEM and GASI have been accredited. The Agency also accredits laboratories involved in testing food products and building materials.

Imported products are subject to conformity assessment, to ensure that they conform to Mongolian standards and approved international standards. The

Agency contracts an independent international verification company to undertake conformity assessments of a range of products classified according to the Harmonized Commodity Description and Coding System (HS) of the World Customs Organization and falling within a long list of categories, including food and agricultural products, chemical products, fuels and petroleum products, plastics and toys. Imported goods are also subject to labelling, shelf-life restriction and other requirements.

## 2.4 Compliance assurance mechanisms

### *Self-monitoring and reporting by regulated entities*

Self-monitoring is required according to the legislation for the different environmental media, as well as through the 2011 Government Resolution No. 311 on entities' self-monitoring, which foresees the designation of a person responsible for such work in an entity holding a permit or licence.

For example, the Law on Air foresees that internal monitoring points within a polluting entity form part of the national monitoring network, with the entity being obliged to provide emissions data to the authorities. No evidence was found to demonstrate that this takes place. Very similar legal arrangements are in place for water. Water users must install equipment to measure water use and, when exceeding 50 m<sup>3</sup> per day, install equipment that monitors use throughout operations and appoint a water use manager. Again, no evidence demonstrated operation of these procedures.

Self-monitoring is also required as part of the EMP, revised annually, consisting of an environmental protection plan and internal monitoring programme. The internal monitoring programme addresses the monitoring and analysis of changes made to the environment as a result of the activity, reporting requirements, means of implementation, timeline and estimated budget.

With regard to implementation of self-monitoring requirements, the overall picture is that larger companies have dedicated units and the quality of self-monitoring reports is better, but SMEs struggle. GASI inspectors can issue penalties for non-meaningful self-reporting.

### *NGO/citizens monitoring*

Public oversight of implementation of environmental legislation is performed by NGOs, community groups and citizens.

NGOs may monitor externally the implementation of an EMP. However, the ability of NGOs to monitor the implementation of the EMP is severely limited by the non-availability of such plans to the public, despite the requirement in 2014 Ministerial Order No. A-03 that they be publicly available on the Ministry's website. The 2012 Government Resolution No. 222 on the EITI also tasked the Minister with the public disclosure of annual EMPs.

In principle, NGOs, community groups and citizens can monitor and, as necessary, complain to the inspectors, courts, relevant administrative bodies or others if they discover possible non-compliance with licence and permit conditions. Further, NGOs whose charter purpose is to protect the environment are entitled to appeal to the courts claiming environmental damages. However, NGOs are severely limited by the resources, skills and knowledge available to them. Furthermore, the admissibility of evidence collected by NGOs has been called into question by the courts. State stamp duty on environmental cases is high for NGOs, thus discouraging appeal to the courts. Administrative cases are handled in administrative courts located in aimag capitals, thus limiting access for herders, for example. There have also been questions raised regarding the impartiality of experts and the courts in cases initiated by NGOs and other public interest claimants.

### *Environmental audit*

One of the major effects of the revision to the environmental protection legislation in 2012 was the introduction of a requirement for entities to commission an independent environmental audit every two years if their activities involve the use of natural resources. According to the 1995 Law on Environmental Protection as amended in 2012, the reports of the planned audits for activities involving the use of natural resources are submitted to the aimag or capital city environment and tourism department. Unplanned audits may be initiated by the aimag governor or the Ministry of Environment and Tourism. In the Ministry, only one staff member is available to handle audits.

In 2013, the Ministry of Environment and Tourism adopted a general methodology for environmental auditing as Annex 2 to Ministerial Order No. A-126. The methodology addresses both planned and unplanned audits. It also addresses the environmental audit of environmental legislation, state policy, national programme implementation, EIA and its implementation and other activities.

Practical implementation of environmental audit has been rather slow. There are examples of audits carried out to international standards, and being made available publicly, on some companies with significant foreign investment, such as major mining companies. However, these are the exception and the limited staff resources in the Ministry to assure quality, and the absence of sanctions for non-compliance, mean that audit practice is being driven by voluntary commitments or investor pressure, not by the legislation.

### *Inspections*

Inspection activities are governed by the 2003 Law on State Supervision and Inspection and general guidelines. Sectoral laws and media-specific legislation commonly include references to monitoring and inspection activities and the role of GASI. Various types of inspection are carried out, both planned and unplanned (e.g. in response to a citizen's complaint), but also unannounced and preventative, or to provide recommendations or a baseline. Multi-sector inspections are carried out by GASI inspectors as GASI covers many sectors, such as food safety and agriculture, health, education and industrial safety.

Inspections are planned annually, quarterly and monthly. Before carrying out an inspection, a directive is drafted indicating the membership of the inspection team and what they will do on site.

Since 2010–2011, a risk-based approach to the planning of inspections has been applied, though the same practice has yet to percolate down throughout the country. Inspection manuals and checklists are in use by GASI inspectors. The inspection checklist includes, among other matters, the verification of self-monitoring reports.

GASI collects statistics on planned, unplanned and, since 2014, follow-up inspections. For the period 2013–2015, the statistics record the numbers of violations detected, seizures (in cash and other forms, such as equipment and natural resources), instances of damage (to be compensated) and fines. The data cover only a limited period but show a steep decline in the total number of inspections of legal entities and citizens, from 20,469 in 2013 to 10,263 in 2014 and 4,351 in 2015. Over the same period, total fines and compensation dropped from 977 million tugriks to 614 million tugriks. The sectors subject to the greatest number of inspections were forest, land and wildlife, followed by lower numbers of inspections on subsoil, EIA and waste, then explosives and minerals.

The Law on Environmental Protection specifies that the Ministry of Environment and Tourism should maintain a unified state register of pollution sources, which is essential for the planning of inspections, but no evidence was provided that a comprehensive register exists.

An inspection can be triggered by a public complaint. In common with all government entities, GASI must respond to complaints within 14 working days. However, the Law on State Supervision and Inspection imposes a shorter timeframe of five working days for initiation of an inspection when it receives a complaint, backed up by evidence, that GASI considers fulfils the requirements; GASI normally responds favourably but no data was provided to support that assertion.

In recent years, GASI environmental inspectors started undertaking advisory service and compliance promotion activities, such as, for example, organizing open-day events for business entities and educational activities for SMEs.

Other authorities are also engaged in monitoring the implementation of environmental requirements. Various authorities may monitor externally the implementation of an EMP of an activity that was subject to detailed EIA. For example, the local government is responsible for checking the implementation of environmental protection measures during mineral exploration. In addition, the authority that originally carried out the general EIA may require that an independent review be commissioned at the expense of the project implementer to review the project's performance in the implementation of the EMP, based on the findings of the external monitoring.

### *Non-compliance response*

Violations relate to matters such as failure to follow procedures (e.g. EIA), obtain a permit or comply with permit conditions, breach of emissions standards, environmental damage or threats to human health, failure to take measures, failure to report or false reporting, use of an invalid permit, carrying out a forbidden activity, or failure to fulfil other obligations. More recently, offences include the failure of an official to exercise their powers in accordance with the legal provisions. The general approach is that a violator of the legislation is subject to criminal and administrative liabilities based on the nature of the violation and the scope of the damage.

Each environmental medium and sectoral law indicates violations and penalties. In addition, in May 2017, a new Law on Violation was passed that

includes a chapter on environmental protection, which addresses violations under these laws once again (desertification, implementation of CITES and the laws on EIA, air, water, fauna and flora, forests, subsoil and minerals and petroleum). The inspector assesses violation and, for administrative offences, issues a notice of violation to the perpetrator, who can acknowledge it or not. If a fine is imposed and the violator acknowledges the violation, the violator simply pays the fine within 14 days. Other possibilities include remediation of damage (if feasible) and immediate suspension of the licence or permit (where human health is at risk). If the violator does not acknowledge the violation, the matter is transferred to the prosecutor's office, with GASI continuing to provide evidence.

Certain offences are immediately treated as criminal, such as the handling of hazardous and toxic chemicals for the purpose of a chemical weapon and terrorist act, or the improper use of toxic and dangerous substances, either through negligence or intentionally, that leads to serious damage to human health or the environment. The 2015 Criminal Code foresees fines, suspended sentences (probation) and imprisonment, with the most serious crime being forest arson. Previous studies, of wildlife crime, have revealed some variation of sentencing across the country, in different aimags, but, generally speaking, limits on data availability prevent a thorough comparison.

With regard to air pollution, GASI has a number of powers, including to: limit or temporarily close operations if a major stationary source is exceeding the emissions standard and, as a result, threatening human health or damaging the environment; together with the police, limit the use of mobile sources exceeding the emissions standard and having a negative impact on air quality; and halt operation in the case of a repeated violation of the emissions standard and conditions set in the permit, or make proposals to alter the manufacturing process to the permitting authority, which must decide within 30 days.

In the mining sector, the Ministry of Environment and Tourism and the Ministry of Mining and Heavy Industry can, in principle, together decide on the withdrawal of a mining licence, though the latter Ministry could not recall this occurring and the procedure was not clear. For example, a mining licence can be revoked for failure to adopt an EMP, comply with such a plan or submit compliance reports.

With regard to hazardous wastes, the Ministry of Environment and Tourism can suspend permission to

conduct operations (collection, transportation, storage, processing and disposal) for up to three months if a waste management entity has violated the terms, requirements or duration of the permit; the permit can be cancelled if, among other reasons, the entity supplied forged documentation with its permit application or it fails to remedy violations of the permit.

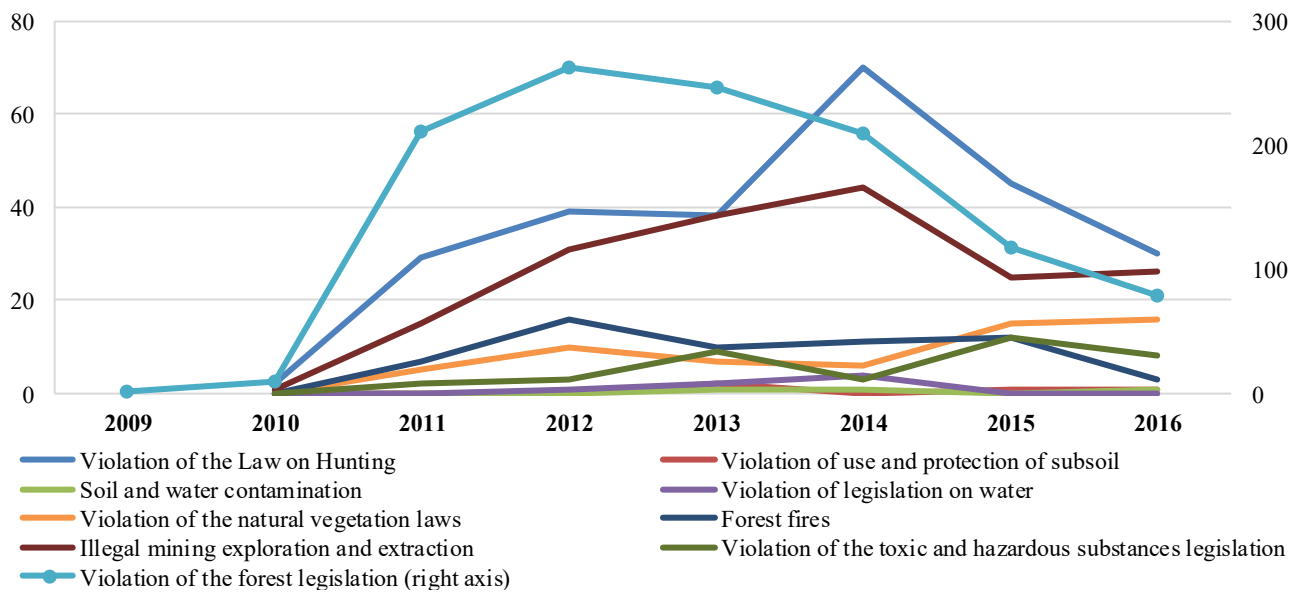
The EIC website lists 1,734 environment-related crime and infringement data entries and 415 seizures and confiscations (in the period 2009–2016). The former data set provides information on the location, date of detection, type of crime or infringement, classification of the offence and status of the procedure (e.g. whether transferred to the prosecutor's office with a recommendation to prosecute). The latter data set provides information on damage and on items seized. Information is not available on the outcome of prosecution, including sentencing. Figure 2.5 shows the evolution of criminal law violations over the period 2011–2016 with the data appearing to be incomplete in the period 2009–2010.

Insufficient staffing and budget limitations of the Court Enforcement Agency represent a barrier for enforcement of court judgments.

## 2.5 Environmental liability, insurance and compensation

Each of the environmental laws includes a provision on liabilities for breach of the provisions. In recent legislation, fines for violations are often expressed in terms of damage caused, or in multiples of the minimum monthly wage, in which case rates vary according to who the violator is, from individuals to officials to entities, and the multiplier is higher for more serious offences. The legal review in 2012 led to a step change in the value of fines; for example, under the 1995 Law on Water, the administrative sanction for non-compliance was a fine of up to 200,000 tugriks, whereas the 2012 Law on Water includes stricter sanctions for non-compliance ranging from monetary fines of up to 7,020,000 tugriks to revocation of water use permits. In the case of a water use permit for industrial purposes, excess use of the resource now leads to increased fees of up to 50 per cent at the relevant tariff as a penalty.

As well as standard fines, fines may be imposed according to environmental damage under certain legislation.

**Figure 2.5: Environmental crimes and offences, 2009–2016, number**

Source: Environmental Information Centre (<http://www.eic.mn/envoffence.php>).

For activities subject to EIA, the developer must pay compensation if an EIA is not carried out or EIA conditions are not complied with. If an EIA is carried out, but improperly and leading to environmental damage, the licensed EIA entity must pay compensation.

The revised 2012 Law on Fauna provides for reimbursement for damage caused to fauna, with the amount assessed for reimbursement being double the ecological and economic assessment value determined by the Government.

The Ministry of Environment and Tourism has developed guidance for certain types of natural resource, including forest and wildlife (2005 Government Resolution No. 248, later replaced by 2011 Government Resolution No. 23 which includes two annexes: on ecological-economic valuation of wild animals and on fees for use of wild animals, wild animal hunting and trapping), but not all types, which leaves a gap in the liability regime. There is also a mismatch between the economic value for animals, their conservation status and their market value (chapter 3).

Besides fines and compensation, the legislation also provides for the payment of a reward. The 2012 Law on Hunting, for example, foresees a reward of 15 per cent of fines imposed to be given to the citizen identifying the person responsible for the violation. The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof (for implementation of CITES) goes further, with rewards of up to 20 per cent of the fines and

damages obtained from a guilty party. The Ministry of Environment and Tourism gave the example of a company that imported chemicals but failed to store them properly, resulting in seepage into the soil. The Ministry brought the case to court. The company had to pay 200 million tugriks in compensation, 200 million tugriks as a fine and 30 million tugriks as a reward.

There is no legal requirement for insurance against liability, though companies can purchase insurance voluntarily and there are insurers providing such services in Mongolia.

## 2.6 Voluntary compliance promotion instruments

### *Environmental management systems*

MNS ISO 14001 on environmental management systems was first approved in 1998. The Agency for Standardization and Metrology accredits organizations that can issue ISO certificates, with two ISO 14001 certification bodies having been accredited. The National Chamber of Commerce and Industry reported that three companies had been certified MNS ISO 14001 so far, including a distillery and a food company. The Ministry of Environment and Tourism suggested about 10 certificates had been issued in total. The ISO Survey 2016 indicated four valid certificates being recorded in Mongolia in 2016. Impediments to the broader uptake of environmental management systems include organizational capacity, the cost (of international consultants) and the time to complete them. Given the Government's vision of

broader uptake of ISO 14001, current efforts to promote it are not adequate.

### *Eco-labelling*

Two selective standards on eco-labelling (Environmental Labels and Declarations (MNS ISO 14021:2001) and MNS ISO TR 14025:2001) have been approved. The 1998 Government Resolution No. 95 (no longer valid), providing rules for incentive measures for citizens, economic entities and organizations that adopt environmentally friendly technologies, was intended to encourage non-harmful products and approved a regulation on eco-labelling, but lacked criteria or indicators. The ministry responsible for environment set out "Rules on Eco-label award to entities, organizations and individuals which manufacture environmentally friendly products and provide services" through the 2007 Ministerial Order No. 272. A technical committee on eco-labelling was established in the Ministry of Environment and Tourism, including civil society representation, but no remuneration was paid for membership, leading to weak participation, and it was vulnerable to changes in Government. The National Chamber of Commerce and Industry studied eco-labelling practice in Western Europe and proposed to the Ministry that the Government not be involved in certification.

In 2017, new rules for incentives to citizens, economic entities and organizations that adopt environmentally friendly technologies were approved (2017 Government Resolution No. 290). According to the new rules, citizens, enterprises and organizations will be acknowledged through a "green certificate" and their products and services will receive an eco-label. The document provides for criteria for the issuance of certificates and eco-labels. Applications will be made to the Ministry of Environment and Tourism and will be considered by a commission consisting of representatives of governmental organizations, NGOs and consumer protection organizations. The commission is to be supported by a technical council.

From 2000 until 2017, the National Chamber of Commerce and Industry conducted its own certification of companies (UNIGAS (gas supply) and DUOBUS (trolley buses), with all their products then eco-labelled by default), of organic products (27 issued) and green hotels (two hotels and two campsites, according to 14 criteria). The National Chamber of Commerce and Industry has an Eco-product Development Council that reviews applications and decides whether to issue certification.

According to the 2016 Law on Organic Food, only verification bodies can now issue organic product certificates and the National Chamber of Commerce and Industry has yet to be accredited and so cannot certify food products at present.

The Agency for Standardization and Metrology and the Ministry of Food, Agriculture and Light Industry currently provide accreditation for animal husbandry, plantation and bee products and are members of IFOAM – Organics International, which sets standards.

### *Corporate social responsibility*

A standard on corporate social responsibility (MNS ISO 26000:2012) has also been approved, though the practice is highly variable. One of the 32 business councils of the National Chamber of Commerce and Industry is on corporate social responsibility, with 50–100 companies involved voluntarily, notably, banks and companies with significant foreign investment, such as major mining companies. According to the Business Council of Mongolia, larger domestic companies and companies with inward investment disclose information on corporate social responsibility.

### *Other*

No systematic effort is applied by the Government to promote resource efficiency and cleaner production among the business community.

Both the National Chamber of Commerce and Industry and the Business Council of Mongolia have engaged in efforts to increase efficiency in resource use by their respective members.

In addition, Mongolia's commercial banks have voluntarily adopted sustainable financing principles as part of due diligence before lending to projects in four key sectors: mining, construction, manufacturing and agriculture. The banks report on the application of these principles.

## **2.7 Legal, policy and institutional framework**

### *Legal framework*

The comprehensive revision of the country's environmental laws in May 2012 (chapter 1) included, among other actions, the revision of some regulatory and compliance assurance mechanisms. However, a number of implementing regulations are still lacking for the environmental legislation passed in 2012. Two particular omissions have been highlighted above. The

Ministry of Environment and Tourism does not issue air pollution permits for major stationary sources of air pollution. Although the revised 2012 Law on Water provides for the issue of wastewater discharge permits, the permits are not issued and fees for wastewater discharge are not collected in the absence of the subsidiary legislation on this issue. The legislation is otherwise comprehensive but continually evolving, which may itself pose problems to the authorities and the regulated entities.

The 2012 Law on Environmental Impact Assessment has been complemented by extensive subsidiary legislation:

- 2013 Government Resolution No. 374 provides general procedures for SEA, cumulative impact assessment and EIA;
- 2014 Ministerial Order No. A-03 provides procedures for public participation in EIA;
- 2014 Ministerial Order No. A-04 provides procedures for managing the Environmental Protection and Rehabilitation Guarantee Fund;
- 2014 Ministerial Order No. A-05 provides for procedures related to EMPs;
- 2014 Ministerial Order No. A-117 provides, in support of the relevant procedures, methodological guidance on SEA, cumulative impact assessment, baseline study, general and detailed EIAs, and EMPs;
- 2013 Ministerial Order No. A-126 provides a general methodology for environmental auditing.

The 2016 Law on Hygiene expanded the EIA approach to the health sector and introduced health impact assessment, which can be triggered by the general EIA.

#### *Policy framework*

A number of state policies and programmes are relevant to regulatory and compliance assurance mechanisms, including the 2016 Mongolia Sustainable Development Vision 2030. Two of the principles of environmental sustainability in the Vision are: to promote participation of local residents and people at large to ensure environmental sustainability; and to develop and enforce environmental rehabilitation at international standard level. For the period 2021–2025, the aim is to encourage the introduction of MNS ISO 14001 on environmental management systems and increase fivefold the number of companies possessing a certificate for this standard; for the period 2026–2030, the aim is to increase tenfold the number of companies possessing certificates. All the identified principles of governance for sustainable development are relevant:

ensuring implementation of stable state policies through consistent activities and strengthening intersectoral coordination; judiciously complying with the principle of "the rule of law"; ensuring transparency in administration; decentralizing and ensuring the participation of all stakeholders in decision-making; and judiciously enforcing ethics in the public sector and eliminating corruption. More generally, it can be observed that the proper application of environmental assessment tools is a precondition to achieving the sustainable development envisioned in this document.

The National Quality Programme (2016 Government Resolution No. 344) was adopted in 2016 to ensure that all necessary standards are developed and accreditation provided in support of the Mongolia Sustainable Development Vision 2030.

The first two strategic objectives of the 2014 Green Development Policy are dependent upon proper assurance of regulations and compliance: promote resource-efficient, low-carbon production and consumption with emphasis on waste reduction; and maintain ecosystem balance and reduce environmental degradation while intensifying reclamation activities and environmental protection. One of the measures foreseen for the first objective is the introduction of environmental standards and norms consistent with international standards and an increase in the results and quality of environmental assessment while promoting competitiveness and increased productivity. The Green Development Policy also foresees promoting the introduction of MNS ISO 14000 in legal entities and the introduction of good practices of efficient production and consumption. In addition, the Policy intends to take risk assessment and preservation measures for the environment, historical and cultural heritage prior to the implementation of large mining operations and development projects.

The 2016 Action Plan for Implementation of Green Development Policy 2016–2030 envisages for the period 2017–2019 that the ministries responsible for justice and environment, using funds from the state budget, will strengthen the capacity of regulatory entities, police forces and the judicial analysis centre to combat environmental crimes, which will require substantial resources.

To support the sustainable growth of the economy, the 2016 Governmental Action Plan for 2016–2020 foresees the revision of the 2003 Law on Standardization and Conformity Assessment and the implementation of the 2016 National Quality Programme, together with the simplification of procedures for obtaining a mining licence and

improvement of mining reclamation and closure processes to meet international standards. Particularly interesting in view of the challenges observed because of high staff turnover, the Action Plan includes an increase in the responsibility and skills of civil servants and, in order to ensure the stability of the civil service in general, a law on the stability of the civil service will be drafted.

Finally, the 2014 State Policy on the Minerals Sector includes support to the EITI and the Responsible Mining Initiative and improving regulations on social, economic and environmental assessment. The Policy has among its laudable aims that environmental protection, land rehabilitation and long-term monitoring will be planned and implemented responsibly, mineral extraction and processing will be restricted in sensitive environments and a legal framework for ensuring transparency and public consultation in developing laws, regulations and large-scale projects will be developed.

#### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Target 12.6 of the 2030 Agenda for Sustainable Development is described in box 2.2.

#### *Institutional framework*

##### Ministry of Environment and Tourism

The Ministry of Environment and Tourism is the state central administrative organization in charge of nature and the environment and plays the leading role in the application of regulatory and compliance assurance instruments on the environment, including several forms of environmental assessment, permitting, licensing, management and audit. At the subnational level, the aimag and capital city environment and tourism departments take on this role according to the magnitude of the activity subject to control. For example, a general EIA is carried out by the Ministry of Environment and Tourism or the aimag or capital city governor's office (environment department), depending on the list in the annex to the Law on Environmental Impact Assessment. That same authority later approves the EMP for the proposed project and grants the permit to go ahead with the project.



#### **Box 2.2: Target 12.6 of the 2030 Agenda for Sustainable Development**

##### **Goal 12: Ensure sustainable consumption and production patterns**

##### **Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle**

The global indicator for Target 12.6 is the Number of companies publishing sustainability reports (Indicator 12.6.1). There is no standard for sustainability reports in Mongolia. The National Chamber of Commerce and Industry reports that very few companies issue sustainability reports, whereas the Business Council of Mongolia suggests that some mining companies do so. Neither body is aware of any tracking of sustainability reporting.

UNEP and the United Nations Conference on Trade and Development are custodians for this indicator and, having determined that globally national statistical systems are currently not collecting data or metadata for this indicator, they are working to determine how to report on this indicator, while also addressing the qualitative aspects of sustainability reporting.

To be able to fulfil monitoring and reporting requirements with regards to Indicator 12.6.1, the Government should introduce a standard or the collection of statistics in consultation with the business sector, including through business associations.

More generally with regard to Target 12.6, it is difficult to see that the Government is encouraging sustainable practices by large and transnational companies, given the heavy reliance on mining in the economy as a whole. Regarding the integration of sustainability information into companies' reporting cycles, the Government's commitment to the EITI is central. Public access to environmental management plans and annual reports on their implementation, on both company and government websites, could be a driver for better sustainability reporting.



The Environment and Natural Resources Management Department of the Ministry (figure 1.2) handles environmental assessment and audit, as well as forest, water, protected areas and the land cadastre. It also hosts the Professional Council on EIA. The Professional Council on EIA includes representatives of ministries responsible for mining, construction and urban development, agriculture, health, roads and transport, and education, GASI, an institute within the Academy of Sciences and the State University of Mongolia; no NGOs are present.

In the Ministry's Environmental Assessment and Audit Division (figure 1.2), six staff are responsible for EIA and one for environmental audit. The staff have between one and four years of experience. In principle, the Ministry can call upon external expertise to support the review of EIA reports but it does not have the necessary budget to do so. Each of the six staff spends about 40 per cent of their time concluding general EIAs, 50 per cent reviewing detailed EIA reports and 10 per cent on other tasks. Together, each month, they produce general EIA conclusions on 50–60 projects, check 30–40 detailed EIA reports for conformity with the legal requirements and support the issuance of the respective decisions by the Professional Council. This represents a highly demanding workload that precludes a thorough examination of each detailed EIA report. High turnover of staff in the Ministry also presents a serious challenge.

The Information and Research Institute of Meteorology, Hydrology and Environment, under the National Agency for Meteorology and Environmental Monitoring (NAMEM), manages the EIC.

#### General Agency for Specialized Inspection

GASI is responsible for inspections and enforcement, together with numerous other actors (police, prosecutor's office, rangers, courts, etc.). GASI cooperates with sectoral ministries for training and other matters. Originally, environmental inspection was the responsibility of the Ministry of Environment and Tourism, but that responsibility was transferred to GASI when it was established as a dedicated inspection agency in 2003.

Views differ among the various actors as to whether the change increased independence, which the inspectors appreciate, or reduced effectiveness. The dialogue between inspectors and staff in the Ministry is now inevitably weaker. GASI does not have access to the Environment and Climate Change Fund to support its environmental compliance work.

GASI observed that it lacks equipment (e.g. mobile testing equipment) and has an inadequate number of staff. The availability of more funding for the responsible authorities, potentially funded by fees and penalties paid into the Environment and Climate Change Fund, could significantly improve inspection, e.g. by making more staff and other resources available. Funds could also support assessment and monitoring of economic activities by the Ministry of Environment and Tourism. Furthermore, funding for expertise and evidence in court would increase rates of prosecution, which could then lead to more penalties (if collected) and ultimately drive greater compliance.

GASI is also responsible for the certification of the staff of internal audit and evaluation units in each of the ministries. At one point it refused to renew certificates because of its dissatisfaction with internal audit reports, this being cited as an indicator of its independence.

In GASI's Division of Environment, Geology and Mining Inspection there are 14 inspectors, including the Director General, of whom seven inspectors work on environmental and tourism issues. Each of the aimags has three environmental inspectors and the soums, one environmental inspector each. The aimag inspectors are accredited by GASI but appointed by the aimag governors. The 202 inspectors of protected areas are appointed by the management of those areas. For the capital city, there are eight environmental inspectors in the governor's office and 16 environmental inspectors in total in the nine düüregs (districts). In total, about 640 certified inspectors address the environment, forestry and mining within the scope of 26 environmental laws and 370 standards.

Only the professional certification of local level (soum) inspectors can be overseen by the central office, together with the activities of aimag-level inspectors. GASI identified the lack of direct control over local (soum) inspectors as being a challenge. A major challenge is the lack of independence and continuity of local level (soum) inspectors who risk being replaced by the governor.

Inspectors are public servants with at least three years of such experience before being trained as inspectors. There are many forms of training provided, online, on site and within sectoral ministries. Nonetheless, GASI indicated that the lack of a dedicated training centre was also a constraint on its work.

The public image of GASI has reportedly improved in recent years as it has been able to verify product quality and respond to public complaints.

### Other institutions

The Ministry of Mining and Heavy Industry develops mining policy and oversees the Mineral Resources and Petroleum Authority. The Ministry does not have an environmental department, but specialized staff in each department, including in the Policy Coordination Department, where a staff member is responsible for both environmental matters and artisanal mining issues. It has a special commission comprised of government specialists, including from the Mineral Resources and Petroleum Authority, the Ministry of Environment and Tourism and the Ministry of Social Welfare, to advise on licensing.

The main functions of the Agency for Standardization and Metrology are standardization, certification and the establishment of national measurement standards. The Agency executes product and service quality certification and provides training on and certification for quality and environmental management systems. The Agency is responsible for emissions and ambient pollution standards, as well as for product standards. The Agency also undertakes accreditation, for example of environmental laboratories under the Ministry of Environment and Tourism and GASI. Accreditation is undertaken in cooperation with relevant sectoral ministries.

The Nuclear Energy Commission coordinates the activities related to the use of nuclear energy and radiation safety.

### Subnational level

At the aimag and capital city level, environment and tourism departments play various roles. For example, the aimag (or capital city) authorities are consulted on minerals licences. The reports of planned audits for activities involving the use of natural resources are also submitted to the aimag environment and tourism department; unplanned audits may be initiated by the aimag governor. Aimag authorities have a role in the water use permitting process for water usage below 50 m<sup>3</sup> a day.

The soums play a weaker role. Nonetheless, the EIA procedures require engagement with soum authorities. Soum authorities also play a role in local-level monitoring, certification and permitting of forestry, hunting and fishing, within limits set at higher levels, and permitting of wastewater discharges.

Under the 2006 Law on Minerals, the competence of local authorities is limited to monitoring compliance with respect to environmental reclamation, health and safety regulations for workers and local residents, and

payments to the treasuries of local administrative bodies by licence holders. Under the 2017 Law on Waste Management, a number of authorities, including at local level, monitor waste management activities.

### Laboratories

GASI has a national laboratory, the head of which is appointed by the Deputy Prime Minister, plus two laboratories at the city level (in Nalaikh and Baganuur) and 21 at aimag level. Ulaanbaatar has its own laboratory reporting to the city's environment department. Each of the aimags also has its own laboratory services that belong to NAMEM, which also has the Central Laboratory of Environment and Metrology.

Regular testing is covered by the state budget, but ad hoc testing requires payment by entities, businesses and the public. A business reportedly has to pay for laboratory tests in response to a public complaint, though this would appear to contradict information provided by NGOs. Business entities obliged to carry out self-monitoring have to pay for the necessary tests.

There is no independent laboratory.

## **2.8 Assessment, conclusions and recommendations**

### *Assessment*

Overall, it can be seen that most of the legal and institutional arrangements are in place to support regulatory and compliance assurance mechanisms. The legal framework is comprehensive, though it suffers from continual minor amendments. The limited number of staff in the Ministry of Environment and Tourism is a constraint on regulatory and compliance assurance activities.

The licensing and permitting system is broad, though it has important gaps, notably regarding air emissions and wastewater discharges. The EIA procedures are comprehensive, though the quality of EIA documentation and the effectiveness of the procedures are questioned by the public. The addition of SEA, cumulative impact assessment and, more recently, health impact assessment, is welcome, as is the introduction of environmental auditing; experience is now needed. Companies also need encouragement to apply voluntary instruments, particularly environmental management systems, that would benefit their businesses as well as the environment and society.

The EIC is potentially an important mechanism for providing information to the public and thus increasing public confidence in the measures being taken by the Government and the private sector to protect the environment. However, there are substantial and important gaps in the datasets that are available and in the scope of the information covered. Because of the gaps, the EIC cannot be used as a management tool by the Ministry of Environment and Tourism and GASI at present.

### *Conclusions and recommendations*

#### Permitting

The pace of revision of permit and licence legislation creates a lack of transparency and understanding, including within the responsible authorities, and without regard to their capacities. Some implementing regulations are absent or incomplete, leading to some gaps in permitting.

#### Recommendation 2.1:

*The Ministry of Environment and Tourism should:*

- (a) *Ensure that the legislation and implementing regulations for air pollution and wastewater permitting are complete;*
- (b) *Fulfil its responsibilities for permitting of air pollution from stationary sources.*

#### Environmental impact assessment criteria and procedures

Mongolia has accumulated extensive experience with EIA procedures. However, the EIA procedures are not seen by all parties as an opportunity to improve projects and their sustainability and efficiency, but as an administrative hurdle. EIA in practice is undermined by poor implementation by licensed entities and ineffective oversight. Public confidence in the EIA system is low, with a common perception that EIAs are frequently "copied and pasted" and that the quality of assessment is inadequate. The high number of entities licensed to undertake a detailed EIA – and perceived problems with quality – bring into question their experience and competence. The Professional Council on EIA, which should address the problems of quality in both licensed entities and the EIAs they produce, lacks independence. NGOs are not included in the Professional Council on EIA and in the review of current licensed entities carrying out detailed EIA. The highly demanding workload of Ministry staff precludes thorough examination of each detailed EIA report. High turnover of staff in the Ministry presents a serious challenge. A cumulative impact assessment

procedure is envisaged by the legislation but its practical application has so far been limited.

#### Recommendation 2.2:

*The Ministry of Environment and Tourism should:*

- (a) *Undertake a review of the criteria and method for licensing entities to undertake detailed EIA;*
- (b) *Commission an independent audit of the currently licensed entities to verify their qualifications, experience and quality of work, and publish the results;*
- (c) *Seek additional staff resources, or funds for the use of qualified external expertise, to support more thorough evaluation of the quality of EIA documentation at both the general and detailed EIA stages;*
- (d) *Examine options to ensure the transparency and independence of the Professional Council on EIA with, as a minimum, the representation of NGOs on the Council, but also the possibility of introducing an independent EIA commission;*
- (e) *Reach out to developers to promote the value of a well-conducted EIA, in terms of both better projects and improved public relations;*
- (f) *Proactively apply the cumulative impact assessment procedure.*

#### Environmental impact assessment in a transboundary context

Mongolia does not have a legal framework for EIA in a transboundary context. Its experience with the transboundary EIA has been limited to a pilot exercise conducted in 2014. The country does not benefit from using the EIA instrument for consultations with neighbouring countries on planned development projects that might have adverse transboundary impacts on the environment.

#### Recommendation 2.3:

*The Ministry of Environment and Tourism should:*

- (a) *Revise legislation in order to include the procedures for EIA in a transboundary context;*
- (b) *Continue to learn from the international experience and good practices in applying EIA in a transboundary context, including those available in the framework of the ECE Convention on Environmental Impact Assessment in a Transboundary Context.*

#### Alternative land rehabilitation

Opinions about how biodiversity offsetting and alternative land rehabilitation actually work differ among governmental officials and international and

local NGOs and activists. NGOs report a lot of confusion over the implementation procedures for biodiversity offsetting and the lack of capacity among local authorities to monitor the implementation of offsetting projects. The Ministry of Environment and Tourism recognizes that guidelines or procedures for biodiversity offsetting and rehabilitation of alternative land are still insufficient.

Recommendation 2.4:

*The Ministry of Environment and Tourism should develop procedures for and guidance on alternative land rehabilitation as part of biodiversity offsetting, including on timescales, enforcement and whether the legal provision has retrospective effect.*

Environmental audit

The introduction of environmental audit in 2012–2013 was an important addition to the environmental management framework, but experience is limited to date.

Recommendation 2.5:

*The Ministry of Environment and Tourism should:*

- (a) *Revise legislation in order to include sanctions for non-compliance with the requirement to carry out environmental audit;*
- (b) *Reach out to companies to promote the value of a well-conducted environmental audit, particularly in terms of operations that are more efficient and of lower risk;*
- (c) *Coordinate the inspection and review of environmental audits with GASL.*

Data on regulatory mechanisms

The EIC, managed by the Information and Research Institute of Meteorology, Hydrology and Environment under NAMEM, is a powerful tool for the sharing of information with the public, but that information is incomplete and data present are often contradictory. Environmental management plans are not being published on the Ministry's website as required by the Government and ministerial resolutions and as needed for public monitoring of development activities. Current data management prevents the Government and the public from benefiting fully from the information gathered. Comprehensive environmental information would improve the Ministry's ability to provide environmental protection and support everyone in enforcing legislation and permits.

Recommendation 2.6:

*The Ministry of Environment and Tourism and the National Agency for Meteorology and Environmental Monitoring should:*

- (a) *Review how data are shared between them, including mechanisms and timing, to ensure that data is complete and up to date, covering the full range of permits and licences, self-monitoring data, audits and emissions and discharges, and in sufficient detail, and ensure their publication online;*
- (b) *Ensure that EIA documentation, including environmental management plans, are published online in accordance with the legislation;*
- (c) *Establish procedures to enable the Ministry to access data in the Environmental Information Centre in such a way as to extract management-relevant information, including for policy review.*

Provision of information to the Extractive Industries Transparency Initiative

EITI Mongolia offers a structure for transparency that could give confidence to foreign investors in the fairness of licensing, which can give a solid framework for responsible mining. The structure provides access to much valuable information, but there are important gaps in the data provided by the responsible authorities. The Government's commitment to the EITI is central for progress in encouraging companies to adopt sustainable practices and integrate sustainability information into their reporting cycles in line with SDG Target 12.6.

Recommendation 2.7:

*The Ministry of Environment and Tourism and the Ministry of Mining and Heavy Industry should ensure the free flow of relevant information to EITI Mongolia, including information on receipts to a special account for mining rehabilitation funds, petroleum licences, the date of application for mining licences and the reasons for and conditions on the numerous licence transfers.*

Compliance promotion and self-monitoring

The adoption of environmental management systems has progressed lately, but so far very few companies have been certified in accordance with MNS ISO 14001 on environmental management systems. Impediments to the broader uptake of the standard include organizational capacity and the cost and the time to complete the certification process. Given the SDV 2030 targets to increase fivefold the number of

companies possessing a certificate in the period 2021–2025 and tenfold in the period 2026–2030, current government efforts to promote the standard are not sufficient. No systematic effort is applied by the Government to promote resource efficiency and cleaner production among the business community. A standard on corporate social responsibility (MNS ISO 26000:2012) has been approved, but the practice is highly variable. Overall, it is difficult to see that the Government is encouraging sustainable practices by large and transnational companies, which will be crucial for Mongolia’s achievement of SDG Target 12.6 (Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle).

With regard to implementation of self-monitoring requirements, the overall picture is that larger companies have dedicated units and the quality of self-monitoring reports is better, but SMEs struggle with this.

*Recommendation 2.8:*

*The Government should:*

- (a) Design and implement regular compliance promotion activities, with a focus on awareness-raising and advisory assistance in the adoption of environmental management systems and corporate social responsibility practices;*
- (b) Ensure self-monitoring by companies and the publication of results.*

## GREENING THE ECONOMY

### 3.1 Greening the tax and tariff system

#### *Pollution charges*

##### Air pollution

Payments for emissions of air pollutants were introduced in 2010 and applied for the first time in 2011. This was the first instance of implementation of the "polluter pays" principle in Mongolia. The air pollution tax is regulated by the central Government, which set tax rates for the following categories of polluters:

- Raw coal extracting companies;
- Producers and importers of organic solvents;
- Major stationary emission sources;
- Owners of motor vehicles and self-propelled vehicles.

Companies that are extracting raw coal are subject to a payment of 1 tugrik per kg, or 1,000 tugriks per ton, corresponding to only US\$0.41 per ton.<sup>1</sup> This is a tax on production, independently of whether the coal is sold domestically or abroad. There is, however, a tax exemption for coal mining companies that engage at the same time in the processing of raw coal and/or are engaged in the production of energy. Annual volumes of coal production were quite volatile during the period 2010–2016, reflecting the demand developments in international markets, notably China. The volume of coal production for which the tax was actually paid corresponded to 50 per cent of total coal production in 2015–2016, down from 72.3 per cent in 2012. In 2014, the revenues collected corresponded to a volume that is 26 per cent higher than total production of 24.4 million tons. This could reflect some delays in tax collection from the previous years. In theory, a tax on coal production should lead to higher coal prices for final consumers, with the result of lower consumption and, related to that, lower CO<sub>2</sub> emissions.

In Mongolia, the large bulk of coal for the local market is provided by State-owned coal producers to State-owned power plants for generation of electricity and heat. The price that power plants have to pay for coal

supply is regulated by the Government and varies depending on the quality of the coal. In 2015, this price ranged from 21,060 tugriks (US\$10.7) to 30,000 tugriks (US\$15.2) per ton. According to the Tenth EITI Report 2015, the average price was some US\$13.5 per ton in 2015, which was below the extraction costs of coal producers. The coal tax corresponded to 3.8 per cent of the average local coal price in 2015. However, in view of the subsidization of local coal consumption, the incentives of the tax on the volume of local coal consumption are ambiguous, to say the least. The likely sole benefit of the tax is to generate revenue for the state budget. Also, most of Mongolian coal production is shipped abroad, mainly to China. Export prices of coal broadly follow price developments in international markets. The average annual border price for Mongolian thermal coal amounted to US\$38.5 per ton in 2015, which was US\$25 above the local price. This also illustrates the strong subsidization of local coal consumption.

Domestic production and import of organic solvents, which are types of volatile organic compounds (VOCs), pay a charge that distinguishes between three categories of solvents, which broadly reflect their toxic effects on people and the kinds of hazards they pose in the workplace. The rates are as follows:

- 30 tugriks (US\$0.012) per kg for category I (e.g. benzene), i.e. US\$12 per ton;
- 20 tugriks (US\$0.080) per kg for category II (e.g. chloroform); i.e. US\$8 per ton;
- 10 tugriks (US\$0.040) per kg for category III (e.g. toluene; alcohols), i.e. US\$4 per ton.

The air pollution tax for owners of motor vehicles distinguishes between vehicles with petrol engines and vehicles with diesel engines. For vehicles with petrol engines, the tax depends on the level of CO<sub>2</sub> emissions (g/km) as indicated in the car documents and verified during technical vehicle inspections. For vehicles with a diesel engine, the tax base is the engine size (cm<sup>3</sup>). This is an annual tax, and it varies for both vehicle categories from 1,800 tugriks (US\$0.75) to 9,500 tugriks (US\$3.90). Vehicles with CO<sub>2</sub> emissions of 121–250 g/km or with an engine size up to 2,500

<sup>1</sup> US\$1 = 2,413.06 tugriks (average monthly exchange rate for May 2017).

cm<sup>3</sup> are exempt from the tax during the first four years after their production.

Stationary sources of emissions of air pollutants (such as CHP, heat-only boilers and industry) are subject to payment of an emission tax if they emit either more than 100 tons of polluting substances per year or more than 5 tons of hazardous substances per year. Polluting substances are allocated to one of four pollutant categories reflecting the relative health and environmental effects. For each category there is a uniform tax rate. Tax rates range from a minimum of 1 tugrik per kg (US\$0.04 per ton) for CO and hydrocarbons to a maximum of 10 tugriks per kg (US\$4.10 per ton) for Benzo(a)pyrene and POPs, such as dioxins. The tax rate for emissions of particulate matter (PM) from the stationary combustion sector, such as coal-fired power plants, is 2 tugriks per kg (table 3.1).

From the outset, however, implementation of this tax encountered problems, given that appropriate instruments for measuring and monitoring the emissions were lacking. In the event, major emission sources, such as thermal power plants, refused to pay the emission tax. In 2012, total charges collected amounted to only 25.1 million tugriks (US\$18,500). In fact, this pollution tax, with a minor exception, has not

been collected since 2015 (table 3.2). In the meantime, with the assistance of JICA, devices for measuring emissions of a number of pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>) have been installed in one of the major power plants (Power Plant 4) and have been operational in 2017. In principle, therefore, the payment of this tax could be resumed at all installations that have proper monitoring instruments installed. This raises the issue of the effective implementation of the pollution tax imposed on major stationary emission sources.

All rates for each of the four categories of air pollution taxes are very low, which makes it unlikely that they create any incentives for changes in the behaviour of polluters. The low tax rates, moreover, have not been adjusted to take into account the high inflation since 2011, which amounted to 50 per cent in 2016 compared with 2011. Cumulative annual revenues collected from the air pollution tax amounted to 133.5 billion tugriks or US\$53.4 million during the period 2011–2016 (converted with the average annual exchange rate of 2016). Of these, 93.5 per cent were accounted for by coal mining activities and 6.4 per cent by the vehicle pollution tax (table 3.2). The sole benefit of the air pollution tax was to generate revenue for the government budget, viz. for reallocation to a Clean Air Fund, which was established in 2010 but abolished in 2015.

**Table 3.1: Air pollution tax rates for major stationary emission sources**

Pollutants	tugrik/kg	US\$/ton
<i>First grade</i>		
Benzo(a)pyrene	10	0.41
Persistent organic pollutants	10	0.41
Mercury and its inorganic compounds	10	0.41
<i>Second grade</i>		
Nitrogen oxide (NO <sub>x</sub> )	5	0.21
Hydrogen sulfides	5	0.21
<i>Third grade</i>		
Sulfur dioxide	2	0.08
Total particulate matter (PM)	2	0.08
<i>Fourth grade</i>		
Carbon monoxide (CO)	1	0.04
Hydrocarbons	1	0.04

Source: 2011 Government Resolution No. 92.

Note: Exchange rate: US\$1 = 2,413.06 tugriks (average monthly exchange rate for May 2017).

**Table 3.2: Revenues from air pollution taxes, 2011–2016, million tugriks**

	2011	2012	2013	2014	2015	2016
Coal extraction	19 009.85	22 452.77	23 473.97	30 720.74	12 188.73	17 701.53
Organic solvents	..	6.69	6.37	10.18	8.28	9.89
Major stationary emission sources	10.27	25.11	9.14	9.59	0.11	0.01
Motor vehicles	710.43	1 377.07	1 255.34	1 607.88	1 485.54	1 585.61
<b>Total</b>	<b>19 730.55</b>	<b>23 861.64</b>	<b>24 744.82</b>	<b>32 348.39</b>	<b>13 682.66</b>	<b>19 297.04</b>
<b>Total (US\$ million)</b>	<b>15.59</b>	<b>17.58</b>	<b>16.24</b>	<b>17.75</b>	<b>6.93</b>	<b>8.91</b>

Source: Ministry of Environment and Tourism, 2017.

Note: Figures in US\$ were calculated using the average annual exchange rate of the corresponding year.

### Water pollution charges

The 2012 Law on Water Pollution Fees introduced charges for pollution of water. Payers are individuals, economic entities and organizations that pollute water resources through discharge of wastewater and by affecting water composition and quality by using water resources, including mineral water resources. The Law identifies five broad types of water pollutants and defines the minimum and maximum allowed tax rates (table 3.3), which are all relatively low. The secondary legislation for implementation of this tax has, however, still to be adopted. This includes, notably, the issuing of permits for discharge of wastewater and the setting of specific pollution taxes for each of the river basins. The proceeds from the water pollution tax, once implemented, are to be allocated to the Environment and Climate Change Fund and earmarked for water protection measures.

### Soil pollution

Mongolia does not apply pollution charges for soil pollution.

### *Taxes and excise duties on transport*

Mongolia imposes excise duties on gasoline and diesel fuels as well as a separate tax on the same kind of fuels.

### Excise duty on gasoline and diesel

Production and exports of petroleum have increased in recent years. However, there is no oil refinery in the country, and therefore Mongolia is nearly entirely dependent on fuel imports from the Russian Federation. Excise duty rates on imports of petrol (gasoline) and diesel depend on the border crossing point. This has given the Government the possibility to provide citizens in more remote regions with a subsidy by lowering the excise duty rate compared with other regions. Excise duty rates have been mainly used by the Government as a buffer for stabilizing domestic retail prices of gasoline and diesel in the face

of increases in world market prices of crude oil as well as rising import costs in US dollar terms, due to the depreciation of the national currency. Thus, in 2008, high fuel prices led the Government to temporarily abolish these excise taxes. In 2013, the Bank of Mongolia, through the Price Stabilization Programme, provided soft loans to fuel importers totalling 192 billion tugriks (US\$115 million) to offset the impact of the depreciation of the tugrik on import prices. However, this increase in state support was insufficient and limited the ability of importers to invest in storage capacity for imported fuels.

Since 2014, the excise duty rates on imported gasoline and diesel are zero for all the border crossing ports, with the exception of the imports entering the country at border ports Sukhbaatar, Zamiin-Uud and Altanbulag. A new round of tax reductions for imports at these border ports was launched in 2016 to contain upward pressures on domestic retail prices of motor fuels. In early 2017, excise duty rates for gasoline amounted to only 50,000 tugriks (US\$20.10) per ton; for diesel the rate was 70,000 tugriks (US\$28.10). This corresponded to a tax rate of only US\$0.02 per litre (table 3.4). Given the significant losses in tax revenues associated with these tax cuts, the Government agreed, however, in the context of an IMF financial support programme adopted in May 2017, to reverse these tax cuts in the course of 2017 in order to mobilize revenues needed for the reduction of the sizeable fiscal deficit.

### Gasoline and diesel fuel tax

This tax, which is distinct from and paid in addition to the excise duty, is levied on all types of gasoline and diesel fuel whether produced within the territory of Mongolia, or imported into Mongolia. The tax rates per ton are as follows:

- Gasoline (up to 90 octane): 20,350 tugriks (US\$8.40);
- Gasoline (90 and more octane): 25,700 tugriks (US\$10.60);
- Diesel: 2,140 tugriks (US\$0.90).

**Table 3.3: Water pollution tax rates**

Polluting substance	Unit	Tugrik		US\$
		Minimum	Maximum	Maximum
Total suspended solids	per kg	100	500	0.231
Organic substance	per kg	100	500	0.231
Minerals	per kg	50	200	0.092
Heavy metals	per kg	1 000	5 000	2.309
Toxic substance	per g	1 000	5 000	2.309

*Note:* Minimum and maximum allowed tax rates by the 2012 Law on Water Pollution Fees. Exchange rate: US\$1 = 2,165.4 tugriks (average annual rate for 2016).



These tax rates have remained unchanged since 2000, although the consumer price index has trebled between then and 2016. In contrast to the excise duty, diesel fuel is taxed at a rate that is substantially lower (around 90 per cent) than rates for gasoline, which suggests that the Government wants to provide a subsidy to economic activities such as logistics and transportation of goods. In any case, the tax rates per litre of fuel are quite low at only some US1 cent per litre. This tax on gasoline and diesel fuel is primarily intended to raise revenue for the Government rather than to create incentives for more rational use of motor fuels. Available data suggest that this tax was not collected in 2015.

#### Excise duties on imported passenger vehicles

The strong rise in the number of imported vehicles has become a major source of air pollution and traffic congestion in urban areas of Mongolia, notably Ulaanbaatar. The Government has used excise duties as an instrument for checking the rise in the number of imported vehicles, especially older cars, which tend to be more polluting than newer ones.

The excise duty on imported motor vehicles increases with the engine size in cm<sup>3</sup> and the age of the vehicle (table 3.5). The import duty is fixed in US dollar terms. To illustrate, for cars with an engine size of 1,500 cm<sup>3</sup> or less, the excise duty for a new vehicle

amounts to US\$500, while the amount of US\$6,000 is due for a vehicle that is 10 or more years old. The excise duty on imported passenger cars has been raised significantly since 2008. Thus, to illustrate, the comparable excise duty on motor cars that were more than four years old was US\$2,000 in 2008, one third of the amount due in 2017.

Dual-fuel (hybrid) vehicles, vehicles running on liquefied gas and electric cars have been exempt from payment of this excise duty. However, as of the beginning of July 2017, these vehicles are taxed at half the corresponding tax rates of other vehicles.

#### Vehicle registration tax

The vehicle registration tax is tantamount to an annual licensing fee, which is collected by each aimag and by the capital city. The central Government determines the range within which municipalities can fix the fee rate they want to apply. These ranges are from 10 to 25 per cent higher in urban areas (Ulaanbaatar, Darkhan Uul Aimag, Orkhon Aimag) than in other soums. For passenger cars, the tax base is the engine capacity in cm<sup>3</sup>. For the highest category (above 3,000 cm<sup>3</sup>) the maximum charge is 33 tugriks/cm<sup>3</sup>, corresponding to some US\$45 per year. For motorcycles, minibuses and larger buses, a flat fee is applied. Trucks are charged based on the weight load in tons.

**Table 3.4: Excise taxes on imported gasoline and diesel fuel**

Date	tugrik/t		tugrik/l	
	Gasoline	Diesel	Gasoline	Diesel
January 2015	400 000	520 000	301.20	438.45
May 2016	260 000	28 000	195.78	23.61
November 2016	160 000	180 000	120.48	151.77
January 2017	50 000	70 000	37.65	59.02
	US\$/t		US\$/l	
January 2015	206.96	269.05	0.16	0.23
January 2017	20.10	28.10	0.02	0.02

Source: 2016 Government Resolutions No. 109 and No. 166; ECE secretariat calculations.

Note: Taxes imposed at Sukhbaatar, Zamin-Uud and Altanbulag border ports. Conversion rate for gasoline, 1 ton = 1,328 litres; conversion rate for diesel, 1 ton = 1,186 litres. Figures in US\$ were calculated using the average monthly exchange rate for the corresponding month.

**Table 3.5: Excise duty rates on imported passenger vehicles, US\$**

Engine capacity (cm <sup>3</sup> )	Age of vehicle (y)			
	0–3	4–6	7–9	10 or more
0–1 500	500	1 000	2 000	6 000
1 501–2 500	1 500	2 000	3 000	7 000
2 501–3 500	2 000	2 500	4 000	8 000
3 501–4 500	4 500	5 000	6 500	10 500
Above 4 501	7 000	7 500	9 000	13 000

Source: Mongolian Customs ([www.customs.gov.mn/en](http://www.customs.gov.mn/en)).

Note: Age calculated as of year of manufacture.

### *Charges (fees) for use of mineral resources*

Mongolia is rich in mineral resources (such as coal, copper, gold, iron ore), and the mining sector has been the mainstay of the economy in recent years. The State is the owner of all mineral deposits, but it does grant exploration and mining rights. The holder of a mining licence has to pay a royalty on sales of minerals extracted. The standard royalty rate is 5 per cent of the sales price, independently of whether these commodities are sold in the domestic market or abroad. For coal and common minerals such as clay, gravel and sand, the standard royalty rate is 2.5 per cent. Effective from 1 January 2011, the Government collects a surtax royalty, which replaced a windfall-profits tax on copper and gold. The surtax royalty is applied to 23 minerals *in addition to* the standard royalty rate. The surtax royalty rate varies from zero to 5 per cent of the market price, with the exception of copper, for which the maximum rate is 30 per cent. The actual rate applied depends on the minerals price in international markets and the degree of processing. The objective is to create incentives for processing of raw mining outputs in Mongolia. The 2006 Law on Minerals, last amended in 2014, stipulates that licence holders (exploration and mining) have to meet certain obligations with regard to environmental protection, i.e. environmental rehabilitation. In order to ensure that a mining company meets its environmental responsibilities, it has to deposit 50 per cent of its annual environmental protection budget in an escrow account. These funds, once spent on environmental protection, are deductible under the 2006 Law on Corporate Income Tax.

Under the 2014 Law on Petroleum, the amount of royalties for petroleum and natural gas extraction can range from 5 to 15 per cent of the value of the crude oil or natural gas extracted. The exact rate is set under a product-sharing agreement based on negotiation between the licence holder and the Government.

Total government receipts from royalties for use of mineral resources amounted to 544.6 billion tugriks (US\$275.9 million) in 2015, accounting for 9.4 per cent of total general government revenues.

### *Charges for use of other natural resources*

The 2012 Law on Fees for Use of Natural Resources regulates charges for the use of forest resources, wild plants, animals and water. It stipulates that user fees are to be based on the ecological-economic value of each these resources. The concept of ecological-economic valuation of natural resources has been developed in Mongolia for the assessment of environmental damage and the amount of

compensation to be paid by natural and legal persons who have caused this damage. In a more general way, the intention is to calculate a monetary value of the ecological and economic benefits derived from the volume, quality and use of natural resources. The development of appropriate natural resource valuation methodologies is a major challenge, given, notably, the technical knowledge that is required. There is a lack of information concerning the effective methodology applied to carry out such assessments for the numerous species of trees, plants, animals, and water basins and categories of land. The relative role played by variables such as available market prices, resource users' willingness to pay and subjective bureaucratic fee setting is not clear. According to a 2013 report by UN-REDD, there has been little "on-the-ground" application of such valuation exercises and there is a lack of information on the economic value of ecosystem services.

### Timber and non-timber forest products

All forest resources are owned by the State. The total forest fund is divided into two areas, conservation forests and utilization forests. Production forests account for only some 7 per cent of the total forest fund. These are primarily designated for commercial timber harvesting based on licences, contractual arrangements and payment of user fees. The Ministry of Environment and Tourism recommends annual quotas for timber harvesting for each of the aimags, taking into account environmental considerations, including water protection and ecological balance. The local governments then decide on the allowable cuts within their respective territories. Permits for forest use are issued by local governments based on a bureaucratic process that evaluates a range of criteria. There is no competitive bidding for allocating user rights. Most of the timber removed from forests is used as fuelwood by domestic households; the remainder is mainly used for construction purposes. Illegal logging has been widespread, but is reported by GASI to have declined in recent years, due to more severe penalty payments.

The Government determines base values of timber species and fuelwood. Aimag governments are setting the charge rates actually applied for the various tree species, but these rates have to be within a range of 6–30 per cent of the base values. For the purposes of the ecological and economic assessment of the value of forest resources, the country was divided into four regions, with their boundaries determined by factors such as the location of the forests (exploitation zone, protection zone) and tree species. Base values established for each tree species differ rather significantly among the four zones (table 3.6). Since

2014, the fee for harvesting Siberian pine, which is considered to be a rare plant, has been set at three times the fee for harvesting Siberian larch. Base values have remained unchanged since their assessment in 2009, despite the generally marked increase in costs and prices in the economy. A new assessment, however, is expected to be carried out during the final quarter of 2017.

**Table 3.6: Ecological-economic valuation of timber of selected tree species**

Tree species	1 000 tugrik/m <sup>3</sup>	US\$/m <sup>3</sup>
Siberian pine ( <i>Pinus sibirica</i> )	89.1–336.6	36.9–139.4
Scotch pine ( <i>Pinus sylvestris</i> )	66.0–255.0	27.3–105.6
Spruce ( <i>Picea obovata</i> )	81.0–306.0	33.6–126.8
Birch ( <i>Betula platyphylla</i> )	30.0–120.0	12.4–55.4

Source: 2009 Government Resolution No. 394, Appendix 1.  
Note: Exchange rate: US\$1 = 2,413.06 tugriks (average for May 2017).

Annual revenues from timber and fuelwood harvesting amounted to 4.5 billion tugriks (US\$1.8 million) in 2016, up from 1.95 billion tugriks in 2011. These revenues are fully allocated to the corresponding local government budgets. In principle, local governments have to use at least 85 per cent of these revenues for forest protection and afforestation activities. However, this obligation has not been met.

Fees for use of NTFPs are regulated in a similar way as those for timber. Harvesting of these products is, in general, only arranged on a biannual basis, in order to allow for adequate recovery of these resources. Annual fees collected amounted to some 6 billion tugriks (US\$2.4 million) in 2016. As is the case for timber, a large proportion of the harvesting of these products takes place outside the official licensing

system. The export of cedar nuts is subject to export prohibition.

### Wild plants

The collection of wild plant species, which can, for example, provide food or be utilized as medicines, is subject to issuance of a licence. The setting of user fees follows a similar procedure to that for forest resources. The Government has established the range of applicable fees for 55 wild plant species, which are allocated to three groups:

- Very rare plants: 25–30 per cent of base value;
- Rare plants: 15–20 per cent of base value;
- Common plants: 5–10 per cent of base value.

Some base values have increased significantly in 2015 compared with those established in 2011 (table 3.7). Total revenue from the use of wild flora amounted to 4.5 billion tugriks (US\$1.8 million) in 2016, up from only 30.4 million tugriks (US\$0.012 million) in 2011. These revenues are allocated to the corresponding local governments, with a minimum of 15 per cent to be earmarked, in principle, for financing of plant protection measures.

### Hunting

Hunting or trapping of animals for all kinds of purposes (household or commercial use, scientific and medical purposes, sport or trophy hunting) is subject to a permit. Local governments set annual hunting quotas within the limits of national quotas set by the central Government. Hunting tourism, especially trophy hunting, has become a major source of public sector revenue. Fees depend on the purpose of wildlife hunting.

**Table 3.7: Base value for the collection of selected wild plant species, 2011, 2015**

Category	tugriks/kg		US\$/kg
	2011	2015	2015
Very rare			
<i>Adonis mongolica</i> Simonovicz	25 000	64 000	26.52
<i>Cistanche deserticola</i> Ma	18 000	65 000	26.94
<i>Juniperus sabina</i> L	50 000	50 000	20.72
Rare			
<i>Sapshnikovia divaricata</i>	16 000	50 000	20.72
<i>Lactuca undulata</i>	10 000	33 000	13.68
<i>Pteridium aquilinum</i> Kuhn	10 000	53 000	21.96
Common			
<i>Senecio vulgaris</i> L	3 600	5 000	2.07
<i>Stelleria chamaejasme</i>	2 500	5 000	2.07
<i>Tanacetum vulgare</i> L	3 300	6 000	2.49

Source: Ministry of Environment and Tourism, 2017.

Note: Exchange rate: US\$1 = 2,413.06 tugriks (average for May 2017).

The catching of fish for scientific and cultural purposes is subject to a fee per kg, which has to be set by local governments within a prescribed range of 700–1,000 tugriks (US\$0.3–0.45) per kg. Hunting of other animals, including birds, for scientific and cultural purposes is subject to a fee (per unit), which may correspond to 20–40 per cent of the established ecological-economic value of the species. Trapping, possession, domestication and breeding of live animals, as well as using animal parts for medical purposes, is charged at 10–20 per cent of sales income.

As regards trophy hunting by foreigners, the benchmark is to charge 80–90 per cent of the price of the corresponding species in international markets. This effective price is established by the Ministry of Environment and Tourism. The export of live animals is charged at 90–100 per cent of the established ecological-economic value per unit.

Revenue from hunting and trapping fees, which are fully allocated to the corresponding local governments, amounted to 3.3 billion tugriks (US\$1.5 million) in 2016, up from only 550 million tugriks in 2010, which at that time corresponded to US\$405 million. A minimum of 50 per cent of these revenues has to be used for wildlife protection measures. As is the case with the use of forest resources, a large part of hunting activity is carried out without a licence, exceeds the established quotas and involves listed species.

#### Water abstraction fees

Direct water abstraction is subject to a water use fee, the main objective being to ensure sustainable use of water resources. Groundwater accounts for most of the water abstracted in Mongolia. The fees charged for water abstraction depend on the purpose of water use.

The Law on Water distinguishes between water consumers and water users. Water consumers are exempt from payment of water use fees, though, depending on the way they receive water, they will be charged a service fee for water transport and distribution. The group of water consumers comprises citizens, economic entities and organizations who use water for non-profit purposes. This group also includes farmers and herders who use water for crop production and their livestock, though this is clearly an economic activity. With this exception, all entities

in industry and other sectors that use water and water bodies for commercial purposes have to pay a water fee.

Water abstraction fees are, in principle, derived from the ecological-economic base value of water resources, which differs among the 29 water basins. For surface water, these base values range from 800 tugriks (US\$0.33) to 2,651 tugriks (US\$1.10) per m<sup>3</sup>; for groundwater, the base values range from 1,651 tugriks (US\$0.68) to 9,440 tugriks (US\$3.90) per m<sup>3</sup>. These wide ranges of base values reflect mainly the differences in economic activities pursued by water users in the different water basins. The Tuul River basin has the highest base values for both surface water and groundwater. Most residents and enterprises, including the three power plants in Ulaanbaatar, depend on the water supplied from the Upper Tuul ecosystem, which therefore has a huge economic value. The process of installing water meters for all users is still ongoing.

The effective water use charge rates are set at the water basin level by local water authorities, taking into account the permissible range – as a percentage of base water values – for each water user group, which are specified in the 2012 Law on Fees for Use of Natural Resources and subsidiary legislation (2013 Government Resolution No. 326 and 2013 Government Resolution No. 327). User fees in the Tuul River basin vary significantly among the various economic sectors. By far the highest rates are paid by the mining industry, which has a very high water demand. The price paid by other users is rather modest. But the dominant feature is that, for all user groups, the charge rates for water abstraction are now much higher than those applied in 2010 (table 3.8). Special rates (as a percentage of sales of electricity generated) apply to the use of surface water by hydropower stations.

Revenues from water use fees amounted to 40.9 billion tugriks (US\$18.9 million) in 2016, up from 4.7 billion tugriks (US\$3.5 million) in 2010.<sup>2</sup> This reflects both the combined effect of the increasing demand for water and the increase in water use fee rates. Revenues are allocated to the respective budgets of local government entities, which should spend no less than 35 per cent of these fee revenues on water management and protection; however, this does not happen.

<sup>2</sup> Dollar value in 2010 calculated using the average annual exchange rate of 2010 (US\$1 = 1,357.9 tugriks).

**Table 3.8: Fees for direct abstraction of groundwater in the Tuul River basin**

Purpose of water use	tugrik/m <sup>3</sup>		US\$/m <sup>3</sup>
	2010	2016	2016
Drinking water	0	0	0
Water for livestock	0	0	0
Mining industry			
Mining and concentrating mineral resources	150	1 510	0.63
Enrichment of copper concentrate	150	1 322	0.55
Exploration drilling	100	1 510	0.63
Heavy industry	50	189	0.08
Light industry	50	94	0.04
Construction works; construction materials production	50	189	0.08
Alcoholic beverage production	50	189	0.08
Bakery production	30	57	0.02
Power stations	30	71	0.03
Agriculture	30	94	0.04

Source: 2009 Government Resolution No. 351, Appendix; 2013 Government Resolution No. 302.

Note: Exchange rate: US\$1 = 2,413.06 tugriks (average for May 2017).

### *Land fees*

Individuals and legal entities, such as business companies, who possess or use land that is owned by the State have to pay land fees. Land possession is not equivalent with land ownership; rather, it is a temporary lease of land in accordance with its purpose of use. The tax base for the user fee is the value of the land, which is established by the Government, but these values do not reflect the market value. The Government also establishes the minimum and maximum fee rates, taking into account the location of land and other parameters, such as socioeconomic and environmental conditions; local governments set the effective fee rates. Herders are exempt from payment of annual land fees for rangeland and hayfields.

For cities, villages and other settlements, the tax rate is within a range of 0.01 to 1 per cent of the land value; it can be up to 3 per cent if the land is in a specially protected area. Ulaanbaatar, the capital city, is divided into five land valuation zones, each with its own uniform land fee rate. The land fees are paid to the corresponding local government. Land use fees are, in general, quite small; moreover, land fees have remained unchanged since the adoption of the 1997 Law on Land Fees. To illustrate, in cities, the annual fee rates range from 44 tugriks (US\$0.02) to 440 tugriks (US\$0.18) per m<sup>2</sup>. Total revenues collected from land fees amounted to 17.5 billion tugriks (US\$8.1 million) in 2016. Fifteen per cent of the revenues collected from land fees by local governments have to be spent on protection, rehabilitation and other conservation measures on state land that is not possessed and used by citizens and legal entities.

### *Charges for utility services*

#### Fees for municipal waste management

Local governments are responsible for the organization of waste collection and disposal services. These are operated by both municipality-owned and private sector companies, which are selected by public tender. In Ulaanbaatar there are 19 waste collection companies, of which nine are owned by the private sector. The duties of the waste collection companies as well as the payments for their services are established in performance contracts with the lower local government levels, i.e. the nine districts in Ulaanbaatar and the soums in the aimags.

Fees to be paid by private households for waste collection services are set by each of the local governments. In Ulaanbaatar, the City Government regulates the fees, which are then formally approved by each of the districts. Up until 2013, the waste fee amounted to 2,000 tugriks (US\$1) per month for residents of apartments, with the exception of the Sukhbaatar district, where each household had to pay 2,500 tugriks. The monthly fee for each household in the ger districts was also set at 2,500 tugriks. This is more than what had to be paid by most residents of the apartment areas and was supposed to reflect the more difficult collection of waste in the ger districts. These fees were already set in 2006. Revenues collected were insufficient to cover basic operating costs, also partly a reflection of the low bill collection rates. The resulting financial gap was partly covered from the city government budget, but this could not prevent a deterioration in the quality of waste services. There was notably a lack of funds for adequate maintenance of vehicles for waste collection and transport operated

by the municipality-owned companies.

Against this background, the City Government of Ulaanbaatar revised the fees for collection and disposal of household waste in 2013 (2013 City Council Resolution No. 12/45), based on a methodology for calculation of waste fees developed by the Ministry of Environment and Tourism. These fees are based on the calculation of collection and transportation costs (including items such as fuel, driver salaries, vehicle maintenance and repair) per ton of waste from the corresponding district to the landfill site. The more distant a household is from a dumpsite, the lower the waste charge per ton (table 3.9). There is no gate fee for waste dumped at the landfill; the annual operating costs of the three landfills, which amount to some 2 billion tugriks (US\$0.83 million), are fully financed from the budget of the Municipality of Ulaanbaatar.

Household waste fees before 2013 were mainly collected directly "door to door" at the time of waste collection. Since then, a new payment system has been introduced, which includes the waste bill, as a separate item, in the monthly utility bill (water, electricity and heat). For households living in apartments, these utility fees have been collected since 2014 by the Housing and Public Services Company (OSNAAG) of Ulaanbaatar; the service charge is 6 per cent of the collected fees. For households living in ger districts, the waste fee has been included in the electricity bill since 2011. The service charge taken by the electricity distribution company is 23 per cent of the collected fee, which appears to be quite high. The new bill collection system has led to a marked improvement in bill collection rates. For residents of apartments, the collection rate was 81.5 per cent in 2014; for ger residents, it was only 58 per cent.

The fees for waste services provided to business companies and other legal entities are set in direct contracts between the businesses and the waste collection companies. These fees are based on the type and size of activity and other indicators and they are collected by the district tax agency. Total revenues from the waste collection services are allocated to the budget of the soum/district and are earmarked for

financing of waste management. Total annual revenues collected from waste fees paid by private households and legal entities fluctuated within a range of 12–13 billion tugriks (US\$5.5 million–US\$6 million) during the period 2014–2016. However, the annual solid waste management costs were much higher, averaging some 23 billion tugriks (US\$10.7 million). The gap between revenues and costs was closed by a subsidy of some 10 billion tugriks (US\$4.7 million) per year from the budget of the Municipality of Ulaanbaatar. This points to the enduring issue of financial sustainability of solid waste management services in Ulaanbaatar City.

#### *Tariffs for water supply and sanitation*

Local governments are responsible for the provision of water supply and sewerage services.

In the capital, the Ulaanbaatar Water Supply and Sewerage Authority (USUG) has been mandated to provide water supply and sanitation services to the population, the business sector and other legal entities. USUG, which is fully owned by the Municipality of Ulaanbaatar, is also in charge of maintaining the water supply and sewerage infrastructure of the city. Given its limited capacities, USUG has outsourced part of the residential water supply to OSNAAG of Ulaanbaatar, which is also fully owned by the Municipality. USUG sells bulk water to OSNAAG, which, in turn, supplies many residents in apartment areas with water through local kantors. Kantors are autonomous communal service entities, operated by private companies under contract with OSNAAG, which are responsible for water supply and bill collection. OSNAAG supplies water services to some 70 per cent of the population; the remainder is serviced by USUG.

USUG also services the residents of ger districts of Ulaanbaatar, which do not have private water distribution connections. Residents are supplied at one of more than 550 kiosks that are either connected to central water pipes or serviced by water trucks. About two thirds of the kiosks depend on water trucks. More than 80 per cent of the kiosks are serviced by USUG; the remainder are operated by the private sector, based on contracts with USUG.

**Table 3.9: Waste collection and disposal tariffs in Ulaanbaatar**

Distance to landfill	tugrik/t	US\$/t
1–10 km	3 000	1.24
11–15 km	2 700	1.12
16–20 km	2 300	0.95
More than 20 km	1 800	0.75

Source: 2013 Resolution of City Council of Ulaanbaatar, No. 12/45.

Note: Exchange rate: US\$1 = 2,413.06 tugriks (average monthly exchange rate for May 2017).

Until 2011, a Municipality Tariff Committee was in charge of tariff setting, which was often dominated by sociopolitical considerations, with the consequence that USUG's financial viability was endangered because tariffs were kept at low levels that were not cost reflective. Against this background, water supply tariffs for residents living in apartments were increased by 66 per cent in 2010, compared with the previous year. Since May 2012, a newly established Water Services Regulatory Commission has been assigned to set water and sewerage tariffs for all the utilities operating in each of the 21 aimags and Ulaanbaatar. The tariffs established by the Commission are reviewed by the Authority for Fair Competition and Consumer Protection, an independent agency that is headed by the Deputy Prime Minister.

USUG's tariff structure for Ulaanbaatar distinguishes between residential and non-residential customers. Tariffs for residential customers distinguish between residents living in apartments and residents of the ger districts. Currently, somewhat less than 70 per cent of private households (outside the ger districts) have water meters installed. The charge rate for drinking water supply has been 550 tugriks (US\$0.26) per m<sup>3</sup> since the beginning of 2017 (table 3.10), up from 286.2 tugriks in 2010 (excl. VAT). This is an increase of 92 per cent. Taking into account the high inflation (some 61.7 per cent), this corresponds to an increase in water supply tariffs in real terms of 18.8 per cent since 2010. Including sewerage charges, the total tariff is 920 tugriks (US\$0.38) per m<sup>3</sup> as of the beginning of 2017, up from 452.96 tugriks in 2016. Adjusted for inflation, this corresponds to an increase in real terms of 10.6 per cent.

The average daily water consumption per person living in an apartment in Ulaanbaatar is some 170

litres, i.e. 5.1 m<sup>3</sup> per month. The average monthly water supply bill per person is therefore only 2,805 tugriks (US\$1.16).<sup>3</sup> Including sewerage, the bill increases to 4,692 tugriks (US\$1.94) per person per month. For a four-person urban household, this corresponds to a monthly water bill of 18,768 tugriks (US\$7.80) or 1.9 per cent of the average monthly household income of 1.007 million tugriks (some US\$417) in 2016.<sup>4</sup> This is hardly an unaffordable cost for the average household, but it could be a problem for lower income households.

For the more than 30 per cent of residential consumers living in apartments without meters, there is a flat tariff of 4,800 tugriks (US\$2) per person per month for water supply and 3,000 tugriks (US\$1.25) for sewerage. The total monthly water bill for an urban household of four persons is therefore 31,200 tugriks (US\$13), which corresponds to some 3 per cent of the average household income in 2016. More generally, the issue of affordability for these unmetered water consumers is broadly the same as for metered water consumers. Assuming that households without meters have the same monthly water consumption as metered households, their implicit tariff for drinking water supply would be 941.2 tugriks/m<sup>3</sup>. This is 71.2 per cent more than the tariff for metered households; including sewerage services, this difference would be some 66 per cent. In principle, such a difference should provide an incentive for having a water meter installed. However, this depends on the costs of water meter installation, which households have to finance themselves. There is no legal provision for forcing households to have meters installed in order to create incentives for water savings. In many of the old residential buildings, moreover, these installation works are technically challenging, with associated upward pressure on costs, which may reach excessive levels.

**Table 3.10: Tariffs for water supply and sewerage in Ulaanbaatar**

Customer group	tugrik/m <sup>3</sup>			US\$/m <sup>3</sup>
	Water supply	Sewerage	Total	Total
Private households	550	370	920	0.38
Non-residential customers				
Beverage factories	1 500	1 200	2 700	1.12
Wool, cashmere and tannery factories	1 050	1 700	2 750	1.14
Other legal entities	1 100	850	1 950	0.81

Source: Water Services Regulatory Commission Resolution No. 94 of 11 November 2016.

Note: Tariffs excl. VAT.

Exchange rate: US\$1 = 2,413.06 tugriks (average rate for May 2017).

<sup>3</sup> Using the average monthly exchange rate for May 2017, US\$1 = 2,413.06 tugriks.

<sup>4</sup> Based on statistics on monthly average household incomes published by the NSO. From a different perspective, the

average monthly bill per person for water supply and sewerage services corresponds to 2 per cent of the new monthly minimum wage of 240,000 tugriks (US\$99.50), effective from the beginning of 2017.

Photo 3: Ulaanbaatar



In ger districts, the existing water tariff at kiosks is 1,000 tugriks (US\$0.5) per m<sup>3</sup>. The tariff has not been changed during the past decade, despite the high cumulative inflation. Average water consumption is very low, at only some 7–8 litres per person per day. This reflects the inconvenience for residents of transporting the water purchased at a kiosk to their home, especially during the winter months. Most residents use carts to transport water, while others use vehicles. There are no sewerage services in ger districts; most households have pit latrines. With a daily consumption of some 8 litres, the monthly water bill will amount to 8,000 tugriks (US\$3.70) per person. For a four-person household, the bill would be 32,000 tugriks (US\$15), which could create an affordability problem for those at the bottom of the income scale.

The tariff structure for non-residential water consumers distinguishes only three customer categories: beverage companies; wool, cashmere and tannery factories; and all other legal entities. All non-residential customers have meters installed. Water supply tariffs are two to three times the rates applied to private households, which points to the existence of

cross-subsidies to private households.

USUG is supposed to be a self-financing enterprise; however, it has been in a fragile financial position for many years because revenues generated do not allow for recovery of operating costs, let alone costs for undertaking maintenance and repairs. This is mainly on account of the significant losses incurred for water supply services in the ger areas, where the unit costs of supplying water at kiosks is significantly higher than operating revenues. These unit costs notably include personnel salaries, fuel costs and other vehicle operating and maintenance costs. USUG has estimated that the costs of supplying water at kiosks are a multiple of the costs of central water supply to apartments. Another source of losses is the supply of water to customers in old, unmetered buildings. Non-revenue water accounted for 14 per cent of water production in 2015. This is partly on account of technical losses, but also reflects significant financial losses due to incomplete metering of water consumption.

The financial position of USUG is also weakened by the persistent sizeable payment delays of the



OSNAAG kantors, which distribute water supplied by USUG. The kantors are themselves in a fragile financial position on account of low tariffs and insufficient bill collection rates, which vary between 65 and 80 per cent, as well as large volumes of non-revenue water (some 20 per cent of water supplied) and overstaffing. This adversely affects the average bill collection rates of USUG, which has been able to ensure high bill collection efficiency for its own direct clients, viz. the residents of metered apartment units.

### Electricity tariffs

All enterprises engaged with the generation, transmission and distribution of conventional energy are State owned. The ageing of power plants has led to unreliable service on the transmission and distribution network. Coal-fired CHP plants and other power plants accounted for 96 per cent of electricity generation in 2016. The remaining 4 per cent was contributed by renewable energy sources, viz. wind power (2.7 per cent), hydropower (1.5 per cent) and solar photovoltaic power (0.005 per cent). The central region integrated power grid, one of four electric power systems in Mongolia, services 86 per cent of total end users. About 20 per cent of electricity is imported from the Russian Federation. The average import price was US\$0.08 per kWh in 2016, up from US\$0.031 in 2005. Most electricity (72 per cent) is consumed by industry and other legal entities while residential consumers (in apartments and ger districts) account for the other 28 per cent.

The Energy Regulatory Commission (ERC) is in charge of setting energy tariffs. By law, it is an independent legal body, but the Government has been interfering in tariff setting. The end-user tariff structure is complex. Household tariffs depend on the city/region, the time of the day, and the quantity of electricity used. Since 2015, there are separate two-block tariffs, also for the residents of ger districts, which, in Ulaanbaatar, are about half of the standard tariff. Households without meters are charged based on a monthly consumption of 350 kWh. Bill collection rates are close to 100 per cent, up from 70 per cent some 10 years ago.

The 2011 amendment to the 2001 Law on Energy called for end-user energy tariffs to be increased gradually to cost recovery levels by 2015. Nonetheless, tariffs have been increased significantly since 2011, broadly in line with inflation. In 2015, the average end-user tariff for industry was 5.3 US cents per kWh and 4.9 US cents for residential consumers. These tariffs are probably among the lowest in the world. The current average electricity tariff allows only partial financing of the operating and

maintenance expenses of power plants. Tariffs below cost recovery levels have led to significant annual losses for energy companies, albeit steadily declining, during the period 2011–2016. The cumulative losses amounted to 236 billion tugriks (US\$105 million) during this period. Actual electricity prices are also distorted, due to coal power subsidies. Power generation companies purchase coal from State-owned mines at a price that is below the cost of extraction. However, this has only partially offset the financial strain on generation companies. According to the ERC, total state subsidies to energy companies amounted to 121 billion tugriks (US\$56 million) during the period 2011–2015. The regulatory regime faces the dilemma of having to pursue two conflicting objectives – to set cost-reflective tariffs on the one hand and, on the other hand, to cater for the objectives of price stability and the risk of social pressure, which has led to reversals in tariff increases in the past.

Given its large size, Mongolia has huge potential in terms of solar and wind energy production. Interest in the sector is growing, which is also reflected in inflows of FDI. A first utility-scale wind farm facility was opened in July 2013, financed by the Millennium Challenge Corporation (MCC). More recently, a Japanese bank (SoftBank) and the European Bank for Reconstruction and Development (EBRD) have started to invest in the renewables sector by financing the construction of wind farms. In 2015, feed-in tariffs designed to provide financial incentives for the development of the renewable energy sector were introduced in the 2007 Law on Renewable Energy. For each of the currently eligible renewable energy resources (hydropower, solar and wind), a tariff range has been defined, distinguishing between grid-connected and stand-alone energy systems (table 3.11). The tariffs are, moreover, set in US dollar terms in order to reduce exchange rate risk for foreign investors. To illustrate, the feed-in tariff for the Salkhit wind farm is 9.5 US cents (229 tugriks). Setting tariffs in US dollar terms has, however, put a significant additional burden on the state budget, given the considerable cumulative depreciation of the national currency against the dollar, which amounted to 37 per cent in 2016 compared with 2010. Feed-in tariffs are guaranteed for a minimum of 10 years.

In 2015, the ERC introduced a so-called "support tariff", which is to finance the difference between the tariffs for electricity from conventional sources and the higher tariffs applied to renewable energy sources. In other words, the support tariff is a premium that end users have to pay for the development of renewable energy resources. Since 2015, the support tariff in the central region, which accounts for 96 per cent of total electricity sales, has been 3.95 tugriks (0.2 US cents)

per kWh. In other regions (Altai Ulaistai and the western region), the support tariff to be added to the standard tariff is 8.30 tugriks (0.4 US cents) per kWh. With more renewable energy systems connected to the grid, the support tariff can be expected to increase. The Government has also designed additional instruments for dealing with some issues that emerged in the context of the implementation of the Law on Renewable Energy, notably, as regards investor confidence. Uncertainty concerning the duration of the feed-in tariffs was addressed in the 2015 amendment of the Law. Long-term price guarantees, based on either legal provisions or power purchase agreements, may help to mitigate the risks associated with investment in renewables. However, a legal framework for ensuring the priority of dispatching renewables is still lacking.

**Table 3.11: Tariffs for renewable energy, US\$/kWh**

Source	Tariff
Generators connected to the grid	
Wind	0.08–0.095
Solar	0.15–0.18
Hydro (up to 5 000 kW)	0.045–0.06
Stand-alone generators	
Wind	0.10–0.15
Solar	0.20–0.30
Hydro	
≤ 500 kW	0.08–0.1
501 kW–2 000 kW	0.05–0.06
2 001 kW–5 000 kW	0.045–0.05

Source: 2007 Law on Renewable Energy as amended in 2015.

#### Affordability of utility tariffs

Although a large proportion of the population (29.6 per cent in 2016, according to the NSO) lives below the poverty line, Mongolia does not have a tradition of targeted income support for the poor. Rather, there exists a range of subsidies and transfers that are targeted at various categories of the population (such as mothers with many children, people with disabilities, the elderly and people with "merits") without regard to income. This has been a costly policy, given that these support payments correspond to some 8 per cent of GDP. The 2012 Law on Social Welfare envisages replacing the existing system of cash transfers with means-tested benefits that would reach the poorest households. However, action on this matter has been slow, though it is important from a socioeconomic perspective. A proposal by the

Government to introduce such schemes was rejected by the State Great Khural in 2015. Nevertheless, a proxy means-testing mechanism has been developed and is being implemented (since mid-2016), for distributing food stamps targeted to the poor. This scheme could eventually also be applied for wider targeting of social programmes, including the issue of affordability of tariffs for utility services. This is currently not the case. To illustrate, a ger household that is entitled, based on the means test, to financial support of 140,000 tugriks (US\$58) per year for the purchase of coal and fuel will receive double the amount if the household includes a person with "merits".

### 3.2 Greening the subsidies system

Mongolia provides tax incentives, i.e. exemptions from income tax, for entities that invest in equipment that is environmentally friendly and improves the efficiency of natural resource use. This measure has been approved by the 2013 Government Resolution No. 303, which establishes a "List of equipment that is environmentally friendly and encourages proper use of natural resources and reduces environmental pollution and waste". It distinguishes 41 categories of eligible equipment, including, inter alia, equipment for water savings, equipment for energy savings, equipment helping to accelerate the phasing out of HCFC-22, electric motors, wind turbine kits, solar power generation kits and hydropower plant equipment. In 2014, total tax exemptions worth 2.4 billion tugriks (US\$1.3 million) were granted to 22 enterprises.

Based on amendments to the 2008 Law on Customs Tariffs and Tax and the 2015 Law on Value Added Tax, which entered into force in December 2015, equipment, parts and spare parts to be used for renewable energy production are exempt from customs import duties and value added tax. A similar measure had been approved in 2013 for the import of wood, which is designed to reduce the extraction of domestic timber resources.

Since the beginning of 2017, moreover, a special zero night tariff applicable from 9 p.m. to 6 a.m. is available for residents of ger districts with metered electricity consumption. This subsidy is offered during winter (January–March) and is designed to create incentives for using electric heating rather than polluting coal-fired stoves. The scheme applies to 146,000 households, and the total value of the subsidy is estimated at 4.8 billion tugriks (US\$2 million).

### 3.3 Investing in environmental protection and green economy

#### *Implementation costs for environment-related strategies, programmes and plans*

At the heart of the Government's policies designed to green the economy is the 2008 MDGs-based Comprehensive National Development Strategy (CNDS) for the period 2008–2021. Among the main priorities is to halt ecosystem imbalances, which is reflected in several specifically environment-related objectives, such as limiting environmental degradation and pollution. The Green Development Policy complemented the CNDS in 2014; a national Action Plan for the Implementation of the Green Development Policy was adopted in 2016. It defines six broad strategic objectives, 51 specific targets and 255 activities for their implementation during the periods 2016–2020 and 2021–2030. In 2016, the country also adopted the Mongolia Sustainable Development Vision 2030, which has an environmental sustainability dimension. None of these documents contains any reference to the costs of achieving the established targets and how to finance them. It is also not clear how they are linked to the annual and medium-term state budget planning processes.

There are, moreover, 17 national programmes for specific environment-related areas and economic sectors, most of which are still being implemented, such as the Water National Programme, Waste Management Improvement Programme and National Biodiversity Programme. These also generally lack estimates of costs for achieving the objectives pursued. A major exception is the National Integrated Water Resources Management Plan of Mongolia, adopted in 2013, which estimates the investment

expenditures required for rehabilitation and extension of the water sector infrastructure at some 2,235 billion tugriks (US\$1 billion) for the period 2014–2016 and another 7,825 billion tugriks (US\$3.6 billion) for the period 2017–2021 (table 3.12). It identifies possible financing sources (state and local government budgets, the private sector, foreign sources), but there is a shortage of information on actual expenditures and their financing.

Since 2013, Mongolia has participated in the Partnership for Action on Green Economy (PAGE) (chapter 1). Since 2013, it has been a member of the Global Green Growth Institute. These platforms promote the advancement of a green economy policymaking framework and specific green economy initiatives in the country.

#### *Green procurement*

Efforts have been under way since 2008 to introduce international best practice in public procurement by improving the existing legal framework. This is reflected in a series of amendments to the 2005 Law on Public Procurement in recent years. Also, with the support of PAGE, a draft action plan for sustainable public procurement has been prepared. As of June 2017, there are no legal provisions for including environmental and social criteria ("sustainable procurement") in the tender documents for goods and services to be bought. The product price is the main criterion for assessing offers from companies. The main challenges for introducing sustainable public procurement include the lack of capacity and resources to develop sustainability criteria for diverse goods and services. Another issue is the extent to which domestic companies are ready to provide green or environmentally friendly goods and services to the Government.

**Table 3.12: Estimated costs of water sector infrastructure investments, million tugriks**

Sector	2014–2016	2017–2021	Total
Safe drinking water supply	1 288 246	2 462 377	3 750 583
Water supply for agriculture	136 526	423 090	559 616
Water supply for industry	614 095	2 277 738	2 891 833
Water resources protection	174 801	373 930	548 731
Water resources management	21 220	52 500	73 720
<b>Total</b>	<b>2 234 887</b>	<b>5 589 593</b>	<b>7 824 480</b>
<b>Total (US\$ million)</b>	<b>1 032.09</b>	<b>2 581.32</b>	<b>3 613.41</b>

Source: National Integrated Water Resources Management Plan of Mongolia, Ulaanbaatar 2013, table 85.

Note: Figures in US\$ were calculated using the average annual exchange rate for 2016: US\$1 = 2,165.4 tugriks.

### Government sector expenditures on environmental protection

Information on environmental expenditures in the government sector is dispersed among the various government institutions involved. A consolidated presentation based on the classification of the functions of government (COFOG), which also distinguishes environmental protection from other purposes of government activities, is not yet available. The methodology used for the compilation of expenditures on environmental protection expenditures is not well documented. A consolidated presentation of environmental expenditures by the main environmental domain, notably, air and water pollution and waste management, is lacking. Mongolia has not yet adopted an international standard for measuring and reporting on environmental expenditures, i.e. the Classification of Environmental Protection Activities and Expenditure (CEPA).

The available data, including some estimates calculated by the ECE secretariat, suggest that environmental protection expenditures in the government sector (central and local) accounted for only 0.7 per cent of total general government expenditures in 2016, down from 2.9 per cent in 2011. Over the same period, environmental expenditures fell to a level corresponding to 0.3 per cent of GDP, down from 1.1 per cent in 2011. These figures do not include government expenditures on wastewater infrastructure, which are available only for 2015. Including these expenditures, environmental protection accounted for 1.7 per cent of total general government expenditures in 2015, corresponding to 0.6 per cent of GDP. More generally, environmental expenditures in recent years have been depressed by the adverse impact of a severe economic crisis on government finances, reflected in a soaring budget deficit and the need for stringent fiscal consolidation measures.

### State (central) government budget

#### Budget of the Ministry of Environment and Tourism

State budget allocations to the Ministry of Environment and Tourism accounted for only 0.6 per cent of total general government expenditures in 2016, down from a peak of 1.9 per cent in 2011. This downward trend is projected to continue in 2017, reflecting the ongoing fiscal stabilization measures, which have also depressed expenditures on staff and capital equipment for the internal functioning of the Ministry of Environment and Tourism (table 3.13).

#### *Environmental funds*

#### Environment and Climate Change Fund

An Environmental Protection Fund was established in 1998, but it was only a budget line in the Ministry of Environment and Tourism budget until 2012. In 2012, it became a separate entity within the Ministry with specific human and financial resource allocations as well as rules and procedures, and its name changed to the Environment and Climate Change Fund. The Fund has a core staff of five. Projects are considered and approved by the Fund Board, which is chaired by the Minister of Environment and Tourism. The Board has 11 members from other ministries, such as the Ministries of Finance and Agriculture). The 2006 Law on Government Special Funds regulates the mandate of the Fund and its financing sources. Currently, the Fund is financed mainly from the state budget. A provision that the Fund shall also receive funds from fees for water pollution (based on the 2012 Law on Fees for Use of Natural Resources) and fees collected for ecotourism licences issued for protected areas has not yet been implemented.

**Table 3.13: Budget of the Ministry of Environment and Tourism, 2011–2017, billion tugriks**

	2011	2012	2013	2014	2015	2016	2017
Current expenditures	63.1	70.7	71.8	66.1	52.5	44.3	48.2
Capital expenditures	31	21.3	4.4	9.3	1.3	1	0.8
<b>Total</b>	<b>94.1</b>	<b>92</b>	<b>76.2</b>	<b>75.4</b>	<b>53.8</b>	<b>45.3</b>	<b>49</b>
<b>Total (US\$)</b>	<b>74.36</b>	<b>67.77</b>	<b>50.00</b>	<b>41.37</b>	<b>27.25</b>	<b>20.92</b>	<b>22.63</b>
<b>Total as percentage of total general government expenditures</b>	<b>1.88</b>	<b>1.42</b>	<b>0.99</b>	<b>0.87</b>	<b>0.69</b>	<b>0.47</b>	<b>0.50</b>

Source: Ministry of Environment and Tourism; ECE secretariat calculations.

Note: Figures in US\$ were calculated using the average annual exchange rate of the corresponding year. 2017: approved budget.

The Fund has been engaged in the financing of various national programmes related to environmental protection. It has a limited financial envelope, which also reflects the impact of fiscal stabilization policies. In 2016, the Fund supported national environmental programmes with a total of 1.2 billion tugriks, corresponding to 0.01 per cent of total general government expenditures (table 3.14). During the period 2014–2016, 40.8 per cent of resources were allocated to environmental education (EE) and 31.1 per cent to the Water National Programme.

#### Clean Air Fund

A Clean Air Fund (CAF), which was part of the Government Special Funds, was established in 2010 to finance measures designed to reduce ambient air pollution. The revenues collected from the air pollution tax funded expenditures of the CAF. But against the backdrop of the need for stringent restrictive fiscal policies, the expenditures dropped sharply after 2013 and far below the annual revenues collected from the air pollution tax. In 2015, when the CAF was closed down, expenditures corresponded to 38.4 per cent of total air pollution tax revenues. Total expenditures of the CAF amounted to 94.2 billion tugriks (US\$66.2 million) during the period 2011–2015, compared with total revenues collected from the air pollution tax of 114.4 billion tugriks (US\$74.1 million).<sup>5</sup> The CAF notably participated in the financing of the "Improved household stoves project" for poor households in the ger districts of Ulaanbaatar. The project provided subsidies to households for the adoption of energy-efficient stoves in order to significantly reduce emissions of PM<sub>2.5</sub> and CO

compared with emissions resulting from the use of inefficient coal-fired stoves for heating homes during winter.

#### *Protection and rehabilitation of natural resources*

Beyond these two environmental funds, the central Government has provided for additional funds for protection and rehabilitation of natural resources, such as protection of special protected areas and land rehabilitation, which were financed by annual allocations from the state budget. The size of these funds was relatively small and did not exceed 0.2 per cent of total general government budget expenditures during the period 2008–2016 (table 3.15).

#### Local government budgets

Revenues collected from fees for use of natural resources (water, plants, forests, hunting and fishing, and land use) are allocated to local governments. There has been a long-standing legal provision that the local governments have to spend a certain minimum share of these revenues on measures designed to promote the conservation and restoration of the corresponding natural resources. The current legal base is the amended 2012 Law on Fees for Use of Natural Resources and 2014 Government Resolution No. 43 regulating revenue generation, expenditures and reporting on nature protection and rehabilitation measures. Total earmarked revenues amounted to 22.9 billion tugriks (US\$10.6 million) in 2016, up from 18.9 billion tugriks (US\$12.4 million) in 2013.

**Table 3.14: Financing of national programmes by the Environment and Climate Change Fund, 2014–2016, million tugriks**

National programme	2014	2015	2016	%
Water	406.82	225.34	445.11	31.13
Waste management	101.17	29.69	30.00	4.65
Special protected areas	35.42	31.70	24.60	2.65
Natural plant protection	62.43		9.00	2.06
Protection of rare and endangered species	247.12	48.86	145.14	12.75
Combating desertification	77.20	97.60	30.00	5.92
Environmental education	552.46	371.61	489.68	40.85
<b>Total</b>	<b>1 482.62</b>	<b>804.79</b>	<b>1 173.52</b>	<b>100.00</b>
<b>Total (US\$)</b>	<b>0.81</b>	<b>0.41</b>	<b>0.54</b>	
<b>Total as per cent of total general government expenditures</b>	0.02	0.01	0.01	

Source: Environment and Climate Change Fund, 2017.

Note: Figures in US\$ were calculated using the average annual exchange rate of the corresponding year. Average percentage shares for the period 2014–2016.

<sup>5</sup> Figures in US\$ were calculated using the corresponding average annual exchange rates.

**Table 3.15: Expenditures on protection and rehabilitation of natural resources, 2008–2016, billion tugriks**

Domain/funding source	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Central government budget</b>									
Nature protection	0.18	0.70	0.88	2.16	0.29	0.89	2.16	1.83	0.00
Protection of special protected areas	2.15	1.90	2.13	2.74	4.22	5.14	6.64	5.36	6.05
Reforestation, forestry activities	2.58	2.29	4.98	4.99	5.79	5.22	4.25	4.04	3.03
Land protection and rehabilitation	0.04	0.00	0.90	0.89	0.23	0.29	0.49	0.49	6.37
<b>Total above</b>	<b>4.94</b>	<b>4.89</b>	<b>8.89</b>	<b>10.78</b>	<b>10.53</b>	<b>11.53</b>	<b>13.54</b>	<b>11.72</b>	<b>15.45</b>
Local government budget	2.45	2.81	2.78	4.72	12.10	10.37	12.04	16.73	9.25
<b>Total central and local government</b>	<b>7.39</b>	<b>7.70</b>	<b>11.67</b>	<b>15.50</b>	<b>22.63</b>	<b>21.90</b>	<b>25.58</b>	<b>28.44</b>	<b>24.69</b>
<b>Total (US\$ million)</b>	<b>6.32</b>	<b>5.36</b>	<b>8.60</b>	<b>12.25</b>	<b>16.67</b>	<b>14.37</b>	<b>14.04</b>	<b>14.41</b>	<b>11.40</b>
<b>Total (% of GDP)</b>	<b>0.08</b>	<b>0.09</b>	<b>0.12</b>	<b>0.12</b>	<b>0.14</b>	<b>0.11</b>	<b>0.12</b>	<b>0.12</b>	<b>0.10</b>
<b>Total (% of general government expenditure)</b>	<b>0.30</b>	<b>0.33</b>	<b>0.38</b>	<b>0.31</b>	<b>0.35</b>	<b>0.28</b>	<b>0.29</b>	<b>0.37</b>	<b>0.25</b>

Source: Ministry of Environment and Tourism and National Statistics Office; ECE secretariat calculations.

Note: Other local government environmental expenditures comprise the expenses on operational activities of local government environmental offices, excluding wages and salaries. Figures in US\$ were calculated using the average annual exchange rate for the corresponding year.

However, these funds were only partly used for the legally authorized purposes related to the protection of natural resources. In 2016, the corresponding aggregate share amounted to 33.1 per cent, down from 60.5 per cent in 2013 (table 3.16). Besides these expenditures based on earmarked funds, local governments also financed other environmental protection measures, which were broadly related to the operational activities of local environmental offices and local environmental rangers. In the aggregate, local government environmental expenditures amounted to 9.25 billion tugriks (US\$4.3 million) in 2016. Combined, the central and local government expenditures on protection and rehabilitation of natural resources fell to a level corresponding to 0.25 per cent of total general government revenues in 2016, after fluctuating within a range of 0.3–0.4 per cent during the period 2008–2015 (table 3.15).

#### *Environmental expenditures in the mining sector*

The 2006 Law on Minerals stipulates that licence holders (exploration and mining) have to meet certain obligations with regard to environmental protection, i.e. mine reclamation designed to restore land to a natural or economically usable state. In order to ensure that a mining company meets its environmental responsibilities, it has to deposit 50 per cent of its annual environmental protection budget in a special bank account that is managed by the governor of the relevant soum or district. These funds, once spent on environmental protection, are deductible under the Law on Corporate Income Tax. Any surplus would be

returned to the company. The practice is, however, that funds that are not spent are rolled over to meet the next year's funding requirement. At the end of 2015, the revenue accumulated in the Special Account for Environment Protection amounted to 10.207 billion tugriks (US\$5.1 million). The question is, however, to what extent these annual transfers into the special account are based on a comprehensive assessment of the work involved to meet the rehabilitation obligations in line with best practice of the mining industry and international accounting standards.

According to the EITI, the current legal framework for mining closure activity is too general and vague, which enables companies to circumvent their obligations towards local authorities concerning rehabilitation of affected areas. It also emphasizes that the Special Account does not meet the standards of transparency and accountability.<sup>6</sup> The rule relating to financing of environmental costs is rather restrictive, given that it relates only to the budget for the current year's environmental costs. An alternative – and better – approach would be to request companies to fund current and future environmental costs through contributions to an escrow account. The Government has started to move in this direction. Thus, in the case of the Oyu Tolgoi Investment Agreement concerning a major copper–gold mining complex in the South Gobi region that was signed in October 2012, the investor has to develop a mine closure plan, which has to be approved by the relevant government authorities, and can set aside funds in a tax-deductible escrow account designed to finance a mine closure plan, starting seven years before mine closure.<sup>7</sup>

<sup>6</sup> EITI 2015.

<sup>7</sup> "What the Oyu Tolgoi agreement contains and what it means for Mongolia", *Mongolian Mining Journal*. (March 2012), available from <http://en.mongolianminingjournal.com/content/19679.shtm>

1. See also International Monetary Fund, *Mongolia: The Fiscal Regime for Mining: A Way Forward* (2010), available from <https://www.mof.gov.mn/wp-content/uploads/2010/07/Fiscal-regime-for-mining2.pdf>

**Table 3.16: Local government environmental expenditures financed from earmarked natural resource fee revenues, 2013–2016, billion tugrik**

Source of revenues/expenditures	%				
	earmarked	2013	2014	2015	2016
Revenues from fees for use of natural resources					
Land use	15	16.72	16.38	17.13	17.46
Forests	85	2.96	3.03	3.66	4.47
Hunting and trapping	50	0.52	1.00	2.38	3.24
Plants	15	0.06	0.55	2.77	4.53
Water	35	38.98	34.34	35.69	40.61
<b>Total above</b>		<b>59.24</b>	<b>55.30</b>	<b>61.63</b>	<b>70.30</b>
of which:					
Earmarked revenues based on 2014 Govt. Res. No. 43		18.94	17.63	19.78	22.93
Actual expenditures based on 2014 Govt. Res. No. 43		11.47	9.84	9.33	7.58
Actual expenditures as % of earmarked revenues		60.5	55.8	47.2	33.1
<i>Memorandum items</i>					
Revenues from fees for use of natural resources (US\$ million)		38.87	30.34	31.22	32.47
Earmarked revenues (US\$ million)		12.43	9.68	10.02	10.59
Actual environmental expenditures (US\$ million)		7.52	5.40	4.72	3.50

Source: National Statistics Office; State of the Environment Report 2015–2016, Ministry of Environment and Tourism, 2017, table 61; ECE secretariat calculations.

Note: Expenditures on protection and rehabilitation of natural resources.

Figures in US\$ were calculated using the average annual exchange rate of the corresponding year.

Official data show that total expenditures of mining companies on land reclamation and biological rehabilitation of land (such as planting of bushes and trees) amounted to 20.9 billion tugriks (US\$11.5 million) in 2014. These expenditures corresponded to 2.3 per cent of total investments in the mining and quarrying sector. During the preceding years, this proportion fluctuated within a range of 0.2 and 0.9 per cent. Between 2006 and 2014, total cumulative expenditures amounted to 124.6 billion tugriks (US\$90.6 billion), of which 62.3 per cent was for land reclamation and the remainder for biological rehabilitation (table 3.17).

#### *Financing of water supply and wastewater infrastructure investments*

Although local governments are responsible for the provision of water supply and sewerage services, they do not participate in practice in the financing of the required investments in the rehabilitation and extension of the water sector infrastructure. Most of the domestic resources for the rehabilitation and extension of the water supply and sewerage infrastructure have been financed by the central Government from the current state budget revenues. The corresponding funds are being included mainly in the budget of the Ministry of Construction and Urban Development. The other important sources of

infrastructure financing are loans and grants from international organizations and other foreign sources. The vast majority of water and sanitation investments have focused on urban areas of Ulaanbaatar and the aimag centres.

Thus, in 2015, total state budget funds for investments in urban and rural water supply and sanitation infrastructure amounted to some US\$24 million, of which about 70 per cent was in urban areas. Additional expenditures from foreign loans and grants amounted to nearly US\$20 million, of which 82 per cent were loans (table 3.18). Domestic funds corresponded to 0.6 per cent of total general government expenditures in 2015. Investments in WWTPs accounted for only 0.2 per cent of total state budget capital expenditures in 2015, down from 1.1 per cent in 2014.

Once new infrastructure projects have been completed, the central Government transfers ownership of these assets to local government without consideration of the issue of financial viability of the operations and maintenance of these systems. Service providers are often unable to generate the revenues required to operate and maintain these facilities, notably to cover any of the capital investment cost and generate sufficient revenues to pay the interest on the loans that helped finance the construction of these assets.

**Table 3.17: Expenditures on rehabilitation works by mining licence holders, 2006–2014, million tugriks**

Domain	2006	2007	2008	2009	2010	2011	2012	2013	2014	2006-2014
Land reclamation	4 662	8 960	7 683	8 300	9 657	7 013	14 808	7 382	9 212	77 677
Biological rehabilitation	2 488	3 501	3 592	4 158	5 708	3 323	8 597	3 876	11 683	46 926
<b>Total</b>	<b>7 150</b>	<b>12 461</b>	<b>11 275</b>	<b>12 458</b>	<b>15 365</b>	<b>10 336</b>	<b>23 405</b>	<b>11 258</b>	<b>20 895</b>	<b>124 603</b>
	<b>US\$ million</b>									
Land reclamation	3.960	7.655	6.571	5.772	7.112	5.542	10.908	4.844	5.055	57.419
Biological rehabilitation	2.114	2.991	3.072	2.892	4.204	2.626	6.333	2.543	6.410	33.185
<b>Total</b>	<b>6.074</b>	<b>10.647</b>	<b>9.643</b>	<b>8.664</b>	<b>11.315</b>	<b>8.168</b>	<b>17.241</b>	<b>7.387</b>	<b>11.465</b>	<b>90.604</b>
<i>Memorandum item</i>										
Total (% of total investment in mining and quarrying sector)	..	..	..	0.71	0.87	0.20	0.50	0.37	2.28	

Source: Mineral Resources Authority of Mongolia, Mining and Geology Statistics, 2015 mid-year data. ECE secretariat calculations.

Note: Annual expenditures in national currency were converted into US\$ using the average annual exchange rate of the corresponding year.

**Table 3.18: Investments in water supply and sewerage infrastructure, 2015, US\$ million**

	State budget	ODA	Total	ODA as % of state budget
Urban areas				
Water supply	6.77	6.16	12.93	90.99
Sanitation	10.26	4.02	14.28	39.18
Rural areas				
Water supply	3.19	5.21	8.4	163.32
Sanitation	3.79	4.56	8.35	120.32
<b>Total</b>	<b>24.01</b>	<b>19.95</b>	<b>43.96</b>	<b>83.09</b>

Source: Ministry of Construction and Urban Development, 2017. UNICEF WASH programme.

### *Renewable Energy Fund*

A Renewable Energy Fund was to be created for mobilizing funds to support the development of the renewable energy sector. The Fund was also expected to finance the differential tariffs for renewables and the end-user tariffs applied. However, given that actual funding remained insignificant, the Fund never reached the operational stage and, in the event, it was deleted from the list of Government Special Funds in 2015.

### *Clean Development Mechanism*

Mongolia has been cooperating with Japan for participating in the Joint Crediting Mechanism under the Kyoto Protocol as a tool to implement the Clean Development Mechanism (CDM). Japan has covered part of the project costs for the application of low-carbon technologies, such as the installation of high-efficiency heat-only boilers in public buildings and, in return, it was credited with the associated carbon reduction credits.

### *Development assistance*

Mongolia has received considerable financial assistance from multilateral and bilateral donors

across a wide spectrum of sectors. Loans and grants from major development partners amounted to some US\$2.2 billion during the period 2009–2015. Key sectors, in terms of project value, were transport (40 per cent), finance (22 per cent), education (8 per cent), water supply and urban infrastructure and services (8 per cent), agriculture and natural resources (4 per cent), energy (3 per cent), public sector management (3 per cent) and others (8 per cent). Formal donor coordination meetings ceased in June 2012, but were followed by informal monthly meetings of donors themselves, including separate working groups on the environment, urban development, agriculture and other matters.

In the area of environmental protection, 34 projects were ongoing in early 2017, which were already partly launched in 2011 or 2013, and which involve the Ministry of Environment and Tourism as the implementing agency. The total value of loans and grants (excluding cofinancing from the Government) amounts to US\$139 million. Major sectors in terms of funding are sustainable management of natural resources (44 per cent), forestry policy and management (22 per cent), biosafety and safe management of hazardous chemicals (14 per cent), green development policy and indicators (9 per cent), water policy and management (4 per cent) and others



(7 per cent).

### *Green jobs*

There is no uniform definition of "green jobs". The International Labour Organization (ILO) concept of "green jobs" has both an environmental and a social dimension. A job is defined as environmentally friendly when it contributes to reducing negative environmental impacts, but it is considered to be a "green job" only when this activity also meets the ILO criteria for decent work. To illustrate, an activity in electronic waste recycling where occupational safety is inadequate is not considered to be a green job. Data requirements for estimating the importance of green jobs in any economy are challenging and all estimates should be "taken with a grain of salt".

A 2014 ILO study, "Green Jobs Mapping in Mongolia", covered eight economic sectors (animal husbandry; crop production; forestry; energy; water supply, sewerage and wastewater treatment; solid waste management; transport; and construction). It estimated that 285,300 jobs – about half of total employment in these sectors – qualified as "environmentally friendly". The animal husbandry sector alone accounted for 252,300 (88.6 per cent) of total environmentally friendly jobs. Only 16.8 per cent of these jobs in the animal husbandry sector qualified as "green", i.e. they also met the criteria for decent work. The total number of green jobs across all eight sectors was estimated at 65,600, corresponding to 11.5 per cent of total employment in those sectors in 2012.

This is broadly in line with the results of more recent labour force surveys conducted by the NSO, which included a separate module of questions concerning jobs in the environmental sector. They show that green jobs accounted, on average, for 9.9 per cent of total employment in the first half of 2016.

### **3.4 Public–private partnerships in support of green economy**

Against the backdrop of substantial needs for infrastructure investments, the Government has given high priority to the use of public–private partnerships (PPPs) to improve the delivery of public infrastructure and public services. The 2008 CNDS identified PPPs as a potential mechanism to mobilize resources from the private sector to support economic growth, diversify the economy and create jobs.

In 2010, the Government approved a list of 121 concession projects in a number of sectors, such as transport, energy, tourism and the environment. A revised list of 50 projects was approved in September

2013. As of 2016, the Government had 39 PPP projects in the pipeline, including projects in the energy, transport and education sectors. Ulaanbaatar City, moreover, signed concessions during 2013–2014 in various areas, including transport, water and wastewater management. Most projects proposed by the different government agencies at the central and local levels were not suitable for concessions, mainly because they were not commercially viable. Among the constraining factors for PPP projects in energy, transport and municipal infrastructure are low tariffs and the dominance of inefficient State-owned companies.

During the period 2011–2015, the Government finalized seven concession agreements under the 2010 Law on Concessions in the energy and transport sectors. These included, notably, the project to construct the lignite-fired CHP Plant Number 5 in the vicinity of Ulaanbaatar, which will be developed by a consortium of private investors based on a build–own–operate–transfer basis, benefiting from an ADB loan. Besides the generation of power, heat generated will be channelled in the form of hot water to the Ulaanbaatar district heating grid.

Another important project in the energy sector is the Salkhit Wind Farm, the first commercial wind farm project in Mongolia, which started operations in June 2013. It involved debt and equity funding from the EBRD and FMO, the Dutch development bank, to private investors. Another PPP project for the construction of the Tsetsii Wind Farm in southern Mongolia in the Gobi Desert, involving JICA, the EBRD and private investors, was launched in September 2016. Another project in the pipeline is the Ulaanbaatar Bus Rapid Transit PPP project, which will be financed by the ADB.

In the environmental sector, the Global Green Growth Institute (GGI), in coordination with government stakeholders such as the Ministry of Environment and Tourism and Ulaanbaatar City, has since September 2015 developed guidelines for PPP models to be applied to build social infrastructure, with the main emphasis on the greening of education buildings (schools, kindergartens), to ensure their high energy savings performance. A pilot green PPP project for developing and implementing nine new education buildings in Ulaanbaatar is currently being prepared, but ensuring commercial viability may be a challenge.

Efforts to promote PPPs also include measures to refocus commercial banks' lending policies on the extent to which investment projects promote sustainable development. Thus, the Mongolian Bankers Association, in cooperation with key

stakeholders in the government sector, such as the Ministry of Environment and Tourism, the Ministry of Finance and the Central Bank, has adopted, starting from January 2015, Sustainable Finance Principles as well as sector guidelines (such as for manufacturing) designed to promote the mobilization of financial resources for bankable green investment projects, including PPPs. But there is no information on how this has affected banks' lending policies. In order to step up the mobilization of resources for financing the transition towards a green economy, in October 2017, the Government established a Mongolian Green Credit Fund (GCF) under the Development Bank of Mongolia.

Nevertheless, the improvement of the regulatory and institutional framework required for organizing and implementing green PPP investment programmes remains a challenge. Despite progress having been made since 2010, when the Law on Concessions was adopted, the capabilities of the central and local government sector to prepare and procure PPP projects are still weak, including the need to ensure that the fiscal implications of PPPs are fully understood and affordable.

### **3.5 Legal, policy and institutional framework for greening the economy**

#### *Legal framework*

#### Economic instruments

The 2008 Law on General Taxation is the umbrella law that establishes the legal basis for the creation of new taxes, tax bases, tax rates and payments.

#### Pollution charges

Air pollution charges are regulated by the Law on Air (revised version of 2012) and the 2010 Law on Air Pollution Fees. The charge rates for specific polluting activities are established in:

- 2011 Joint Order of the Minister of Nature, Environment and Tourism and the Minister of Roads, Construction and Urban Development, No. A-63/67 on regulating fees for motor vehicle emissions of CO<sub>2</sub> according to engine size;
- 2010 Government Resolution No. 273 on approval of a regulation to adopt the charge rate (for air pollution), which establishes charge rates for production and import of organic solvents (Annex 2);
- 2011 Government Resolution No. 92 on quotas and charges, which establishes charge rates for

emissions of pollutants from major stationary pollution sources (Annex 1).

Water pollution charges are based on the Law on Water and the 2012 Law on Water Pollution Fees, but secondary legislation for the implementation of this instrument has not yet been adopted.

#### Excise duties

Excise duties are levied based on the 2006 Law on Excise, which has since been amended several times. Specific excise duty rates on gasoline and diesel fuel and imports of passenger motor vehicles are set in government resolutions. The distinct tax on gasoline and diesel fuel is based on the 1995 Law on Gasoline and Diesel Fuel Tax, which was last amended in 2003.

#### Mineral resource royalties

Royalties for mining activities are regulated by the 2006 Law on Minerals. A number of amendments to this Law became effective on 1 July 2014. Among these is that the exploration and mining of common (which includes gravel sand and clay) minerals is no longer regulated by the Law on Minerals but by the 2014 Law on Minerals of Common Occurrence. The 2014 Resolution of the State Great Khural No. 18 on the State Policy on the Minerals Sector aims to promote private sector involvement in the development of the mining sector using the instrument of surtax royalties. The Law on Petroleum regulates royalties for petroleum and natural gas exploitation.

#### Fees for use of natural resources

Charges for use of natural resources are regulated by the 2012 Law on Fees for Use of Natural Resources. The Law also establishes minimum shares of revenues collected from user charges that local governments have to spend on the conservation of the corresponding resources. This Law consolidates separate laws for each of the resource categories adopted in 1995 as well as the 2000 Law on Reinvestment of Natural Resource Use Fees for the Protection of the Environment and the Restoration of Natural Resources (no longer valid). The Law is supplemented by 2014 Government Resolution No. 43 on a revised regulation on revenue generation, expenditure and reporting on measures for nature protection and rehabilitation. Specific charge rates for use of natural resources are established in separate government resolutions, such as the 2014 Government Resolution No. 307 on fees for using timber and fuelwood for personal needs or the 2013 Government Resolutions No. 326 and No. 327, which refer to fees for industrial water use. Payments for use of fauna and

hunting permits are based on the 2011 Government Resolution No. 23. Base values for harvesting of timber species and fuelwood are established in the 2009 Order of the Minister of Environment and Tourism No. 394 on the economic and ecological assessment of timber resources, as well as in 2014 Government Resolution No. 307 on fees for using timber and fuelwood.

The 1997 Law on Land Fees regulates charges for the use of land. The 1997 Government Resolution No. 152, Annex 2, determines base fee rates and maximum and minimum rates for annual land fee payments. Local governments set specific land fee rates.

#### Ecological and economic valuation of natural resources

The ecological and economic valuation of natural resources is regulated and approved by separate government resolutions:

- 2009 Order of the Minister of Environment and Tourism No. 394 on approval of the ecological-economic valuation of forest resources;
- 2011 Government Resolution No. 23 on ecological-economic valuation of fauna;
- 2015 Resolution of the Minister of Environment, Green Development and Tourism on ecological-economic assessment of plants, Annex A-282;
- 2011 Government Resolution No. 302 on the ecological-economic value of water.

#### Municipal waste collection fees

The 2012 Law on Waste Management regulated the collection and disposal of municipal waste. The Ministry of Environment and Tourism also developed the methodology for calculation of waste service fees. Specific waste collection fees are set at the local government level, e.g. the 2013 Ulaanbaatar City Council Resolution No. 12/45. In 2017, a new Law on Waste Management was adopted (chapter 10).

#### Tariffs for water supply and sewerage

The 2012 Law on Water and the 2011 Law on Use of Water Supply and Sewerage System in Urban and Settlement Areas establish the general legal framework for water supply and sewerage tariffs. Tariffs for water supply and sewerage services have been established for all cities and aimags by the Water Services Regulatory Commission since 2012. Tariffs are subject to review by the Authority for Fair Competition and Consumer Protection. Until 2011, municipal tariff committees were in charge of tariff setting.

#### Electricity tariffs

The general framework for the setting of energy tariffs, including for renewables, is set by the 2001 Law on Energy. The ERC is in charge of setting energy tariffs. The 2007 Law on Renewable Energy established levels of feed-in tariffs for different renewable energy sources.

#### Public-private partnerships

The legal framework for public-private partnerships (PPPs) consists mainly of the 2010 Law on Concessions and related secondary regulations and the Law on Investment, which was revised in 2013. The 2009 Resolution of the State Great Khural No. 64 establishes the main principles of the State Policy on Public-Private Partnerships. Concessions are available for assets of both central and local government authorities. A central government PPP unit, which, since 2011, is in charge of defining the policy on PPPs and organizing their implementation, was moved from the Ministry of Mining and Heavy Industry to the new National Development Agency (NDA) in 2016.

#### *Legal and institutional framework for the financing of environmental expenditures*

The State Great Khural is responsible for approving all legislative acts and laws, medium-term and annual strategic plans and the annual budget. The Ministry of Finance is the main central government agency in charge of formulating fiscal policy and preparation and implementation of the annual budget. Tax revenue is collected through the General Department of Taxation and the General Department of Customs. The Ministry of Finance defines annual and medium-term socioeconomic policy and it is in charge of negotiating international borrowing agreements.

The fiscal framework for public finance management has been significantly improved since 2010. The 2010 Law on Fiscal Stability introduced fiscal rules to cope with, notably, volatile mineral prices and adverse structural effects ("Dutch disease") that risk development in economies that depend strongly on exploitation of natural resources. Financial allocations to individual ministries, such as the Ministry of Environment and Tourism, are based on the annual budgets adopted by the State Great Khural. The 2011 Law on Integrated Budget, which entered into force at the beginning of 2012, notably aims at strengthening the medium-term fiscal framework, including the planning of public investment.

Most of the revenues for infrastructure investments are raised at the central government level through the tax system. They are included in the budget allocations to ministries, mainly the Ministry of Construction and Urban Development. For large projects, there is a four-year rolling Public Investment Programme (PIP). For capital projects, it is mandatory to include the recurrent cost implications in budget proposals.

An integral part of the state (central government) budget are Government Special Funds, which are based on the Law on Government Special Funds. These funds are designed to finance activities serving a specific purpose based on resource allocations from the state budget, earmarked government revenues and other sources. Among the numerous special funds is the Environment and Climate Change Fund. In addition, the Clean Air Fund and the Renewable Energy Fund were on the list of special funds before they were abolished.

The 2011 Law on Integrated Budget also enhanced the role and financial resources of local governments. It stipulated that the capital city and the 21 aimags are responsible for, inter alia, the provision of municipal services such as water supply and sewerage and waste collection and disposal, as well as public transport, urban roads and bridges and social welfare services. Local government functions are being financed through a number of local taxes and fiscal transfers from the state budget. A major role is played in this context by the General Local Development Fund (GLDF), which is administered by the Ministry of Finance. Based on the 2012 Government Resolution No. 30, the revenues of the GLDF consist of shared state tax revenues (25 per cent of VAT, 5 per cent of royalties from mineral exploitation – since 2015) and other sources. There are annual transfers from the GLDF to local development funds, which exist for

each city and aimag. These local development funds are the main vehicle through which municipal infrastructure projects are being financed, with the main focus on rehabilitation. The size of the annual transfers (so-called equalization funds) from the GLDF is determined by the Ministry of Finance; the volume of funds depends on a number of indicators, such as population size, population density, geographical location (remoteness) and level of socioeconomic development. In 2015, the total transfers to local development funds amounted to 105.9 billion tugriks (some US\$50 million). More generally, central government transfers, including those outside the GLDF, have provided significant financial support to service deliveries and infrastructure projects at the local government level. To illustrate, in 2013, excluding the resource transfers from the state budget, local government accounted for 8.6 per cent of total public expenditures; however, including these transfers, the proportion of local government spending in total public sector spending was 23 per cent.

The Human Development Fund was established in 2009 with the purpose of accumulating funds from extractive industry revenue (65 per cent of revenues from mineral resources taxes as well as oil and gas licence fees) as "savings for rainy days" and for social support to citizens, i.e. payments of pensions, medical insurance and cash allowances for children. However, since June 2016, these measures have been financed directly from the state budget.

*Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis SDG Targets 8.3, 8.4, 12.7 and 12.c is described in box 3.1.



**Box 3.1: Targets 8.3, 8.4, 12.7 and 12.c  
of the 2030 Agenda for Sustainable Development**



**Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**

Green growth, which focuses on the common boundaries and interactions between the economy and the environment, is an integral part of sustainable development. The goal of green growth is "fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD). Given the trade-offs between economic growth and environmental protection, the transition to a greener growth path can likely best be achieved in a flexible, dynamic economy. At the same time, it is important for sustainable development that economic growth is inclusive, i.e. it has to be ensured that there is a fair distribution of the gains in welfare, in both monetary and non-monetary terms, across the population.

**Target 8.3: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services**

The global indicator for Target 8.3 is Proportion of informal employment in non-agriculture employment, by sex (Indicator 8.3.1). The ILO defines employment in the informal sector as any production or service activity by individuals or group of people, outside the agricultural sector, without formal structure, that are not covered by formal registration and social security. Based on a labour force survey conducted by the NSO, there were some 174,500 people working in the informal sector of Mongolia in 2012, of which 44 per cent were in Ulaanbaatar. The number of persons in the informal sector corresponded to 9.6 per cent of the population of age 15 and above and to 25.4 per cent of total employees in the economy (outside agriculture and forestry). This suggests that the informal sector is a major driver of economic growth and a mainstay of social and economic life in Mongolia. Against this background, the Government should pursue strategies that promote entrepreneurship and economic growth, combined with regulatory measures and incentives designed to facilitate the formalization of activities currently conducted in the informal sector, including the improvement of social protection.

**Target 8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead**

Another important component of green growth and sustainable development is the progressive improvement in resource efficiency in consumption and production, with the aim to decouple economic growth from environmental degradation.

This is also a major challenge for Mongolia, which has an economy characterized by high energy intensity, high carbon intensity and low material productivity. Improving the efficiency of electricity and heat production and consumption, as well as the use of materials, will require major resources to be invested in R&D and technological innovations and the diversification of economic structures. In order to gauge development in these areas, the challenge will be to develop reliable statistics for the measurement of these and other green indicators. In July 2017, the NSO approved 38 green development indicators. This measure should enable the Government to continuously monitor progress towards the implementation of the 2014 Green Development Policy. It is important to promote this work by providing the NSO with adequate resources and technical assistance. It is also important for Mongolia, as a small open economy, to devote sufficient resources to the development and diffusion of mainly imported green technologies, which, in turn, requires developing domestic absorption capacity to adapt these technologies to local circumstances.

**Goal 12: Ensure sustainable consumption and production patterns**

**Target 12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities**

On the demand side, the Government can help to promote the fostering of sustainable consumption and production patterns by green(er) public procurement. Mongolia should develop the necessary legal tools and practical expertise in this area, which are currently not in place.

**Target 12.c: Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities**

Another facet of fostering sustainable consumption and production patterns is the gradual reduction and eventual phasing out of fossil-fuel subsidies. Critical areas that should be addressed in Mongolia are the subsidies provided for use of raw coal by power plants and the low excise duties on petrol and gasoline, which do not encourage the rational use of motor fuels.

### 3.6 Assessment, conclusions and recommendations

#### *Assessment*

The role of economic instruments in creating effective incentives for changes in the behaviour of polluters has remained modest. The tax rates applied to the four components of the air pollution tax, i.e. raw coal, organic solvents, emissions and vehicles, are too low for achieving this. Moreover, the tax on emissions could not be effectively implemented because the required measurement instruments were not installed. The main purpose of the air pollution tax has been to

generate state budget revenue, which was temporarily allocated to the now defunct Clean Air Fund. The water pollution tax was adopted in 2012, but the secondary legislation necessary for its implementation has not been introduced.

In a similar vein, the excise duty on motor fuels has not been used as an instrument for encouraging more rational use of petrol and diesel but, rather, mainly as an instrument for stabilizing the domestic retail prices of these products, given the upward pressures on import costs resulting from the progressive depreciation of the national currency. This entailed excise duties even being reduced to zero in some

instances, which has led to considerable losses in government budget revenue. The separate tax on gasoline and diesel fuel is primarily intended to raise state budget revenue. In contrast, the excise duty scheme on imported passenger cars is well designed by imposing higher taxes on older vehicles and by exempting more eco-friendly cars from the tax.

Royalties on mineral resource exploitation are generating considerable revenue for the state budget, which is partly reallocated to support local government budgets and, notably, to the Human Development Fund for the financing of social security and social assistance measures. It remains to be seen whether the surtax royalty will have the intended effect of creating effective incentives for more domestic processing of mineral resources.

The recognition of natural capital (e.g. ecosystems) as a factor of production and its role in improving the well-being of the population is a key feature of a green growth framework. Mongolia has developed and applied methodologies for assessing the monetary value of natural resources (such as forest and water), which are used as benchmarks for the calculation of environmental damage compensation. These assessments have been partly revised and led to substantial increases in the values of these natural assets. However, the ways and means of establishing these asset values are not very transparent and therefore difficult to appreciate. The same holds for the fees imposed on the use of the numerous specific types of natural resources (timber, flora, fauna), which are set at the local government level. The valuation of ecosystem services remains a major challenge.

In the area of utility services (water supply and sewerage, municipal waste collection, energy supply), the challenge is to continue the move towards cost-reflective tariffs in order to ensure the rational use of resources as well as the financial viability of service providers. In general, revenues are insufficient for financing operating and maintenance costs, resulting in these services having to rely on subsidies from local and state budgets.

The exploitation of the huge potential for renewable energy remains a major challenge, despite a generous system of feed-in tariffs. The system of support tariffs will create more transparency with regard to the costs for end users of the increasing use of renewable energy sources. There are also some subsidy schemes designed to promote the diffusion of green technologies, but the overall scale of these appears to be limited.

The greening of economic growth is a key goal of the national development policies. Sectoral policies are being revised in line with the 2014 Green Development Policy and 2016 Mongolia Sustainable Development Vision 2030. However, the overall costs of achieving the numerous related targets and measures have not been estimated. Financing of environmental expenditures and related national programmes relies largely on annual state budget allocations and foreign loans and grants. Local governments can use earmarked environment-related revenues for financing environment protection measures, but actual expenditures have remained significantly below the level of earmarked revenues, pointing to the diversion of funds to non-environmental purposes. There is a scarcity of information on investments in municipal infrastructure such as waste collection and disposal, as well as water supply and sewerage services, notably, wastewater treatment.

Resources allocated to the Environment and Climate Change Fund for the financing of national environment-related programmes have remained quite small, which narrowly circumscribes the Fund's impact on promoting environmental protection. There is no annual reporting on activities financed by the Fund. The need for stringent fiscal policy has adversely affected the annual state budget allocations for environmental protection in recent years. Against this background, a Clean Air Fund, established in 2010 and designed to finance urban air pollution reduction measures, was abolished in 2015.

In the mining sector, which is the mainstay of the Mongolian economy, companies are obliged to ensure adequate rehabilitation of affected areas after the cessation of mining activities. There is lingering uncertainty of the extent to which the annual funds that companies have to set aside for this purpose, years before a mine closure, are sufficient for financing the land reclamation and biological rehabilitation measures in such a way that they are in line with mining industry best practice.

There is only limited involvement of PPPs in financing and operating municipal services in areas such as waste management and water supply and sewerage services, reflecting the adverse impact of regulated (low) service fees on the commercial viability of PPP projects. In addition, the capabilities of local governments to engage in such projects are, in general, still weak, pointing to the need for effective oversight of such projects.

The legal framework for public procurement has been improved to be more in line with best international

practices. However, to date, there are no legal provisions for including environmental and social criteria ("sustainable procurement") in the tender documents for goods and services to be bought.

The analysis of statistics on environmental expenditures is circumscribed, not only by a shortage of relevant data but also due to fact that Mongolia has not yet adopted a comprehensive methodology for measuring and reporting on environmental expenditures, such as the international Classification of Environmental Protection Activities (CEPA). A related statistical challenge is the measurement of progress towards a green economy based on indicators such as material productivity and, more generally, the extent to which economic growth is achieved at the expense of a deterioration of environmental quality.

### *Conclusions and recommendations*

#### Environment-related taxes and subsidies

The "polluter pays" principle is not effectively applied in Mongolia. The air pollution tax is more symbolic, its main purpose being to generate government revenue. The implementation of this instrument has also been hindered by the lack of adequate measurement instruments for the emission of pollutants. The water pollution tax has been awaiting the adoption of the secondary legislation required for its implementation. Environment-related taxes such as excises on petrol and diesel have not served any environmental protection purpose. In addition, more recently, in anticipation of social pressure, these excises have not even generated significant government revenue, due to a near general zero-rate policy. More generally, Mongolia has been pursuing a policy of providing fossil-fuel subsidies, also covering the use of coal, which should be reformed in line with SDG Target 12.c to prevent wasteful consumption of these resources.

#### Recommendation 3.1:

*The Government should:*

- (a) *Ensure that taxes on pollution provide effective incentives for changes in behaviour of polluting companies;*
- (b) *Adjust the duty rates on gasoline and diesel as well as the separate tax on these products so that they help promote fuel saving behaviour and the import and use of cleaner fuels;*
- (c) *Consider the reform of coal subsidies provided to industry and households.*

#### Charges for use of natural resources

The charges for use of natural resources (forests, plants, hunting, water) are mainly derived from an assessment of their monetary value, taking into account a range of economic and ecological indicators, and are not adjusted for inflation. These base values are mainly designed for gauging the size of environmental damage caused to these resources and for setting the level of compensation to be paid by those violating the established legal standards. User fees, in turn, are established as a percentage of the monetary base values, which are, within defined limits, left to local governments.

#### Recommendation 3.2:

*The Government should:*

- (a) *Regularly adjust the established resource base values;*
- (b) *Revise the existing methodology for assessing the monetary value of these natural resources with a view to regularly adjusting these to inflation.*

#### Utility services

The utility services sector in Mongolia faces the challenge of ensuring the financial sustainability of its operations given that existing tariffs are not cost reflective. This makes the sector dependent on subsidies and transfers from local government and state budgets. The general feature is a lack of adequate funds for maintenance and renewal of the infrastructure. Tariffs for water supply and energy do not provide sufficient incentives for rational use of these resources. Tariffs that are insufficient for recovering costs are also a barrier for greater private sector involvement in the provision of these services.

#### Recommendation 3.3:

*The Government should:*

- (a) *Develop and apply tariff methodologies that focus on cost recovery;*
- (b) *Support the installation of meters (mainly for water) and improve bill collection rates;*
- (c) *Introduce a separate landfill tax on the discharge of municipal waste;*
- (d) *Develop targeted social support measures to address affordability constraints for poor persons.*

#### Funding for environmental protection

Mongolia has adopted a green development agenda as well as separate national programmes for the main

environmental domains, such as water, forests and protected areas. Funding of these agendas and programmes mainly relies on year-to-year allocations from the state budget and on foreign loans and grants. Local governments can rely on their own earmarked revenues for financing environmental expenditures – but the actual expenditures have fallen increasingly short of the mandatory funds that they should spend. More generally, total environmental expenditures by the government sector appear to be rather small, raising doubts about the effective role that the public sector can play in the pursuit of the green development agenda.

Recommendation 3.4:

*The Government should ensure that:*

- (a) *Resources allocated to the environmental sector are commensurate with the overall development agenda of the country, in particular the goals and actions defined in the Mongolia Sustainable Development Vision 2030, the 2014 Green Development Policy and the national programmes for the main environmental domains;*
- (b) *Priorities are effectively set in a context of limited public resources;*
- (c) *Local governments make effective use of all the funds earmarked for spending on environmental and nature protection.*

Rehabilitation of mining sites

The mining sector is the mainstay of the Mongolian economy; however, mining activity is also a major source of environmental pressures. Mining companies are obliged to build up financial reserves to ensure adequate rehabilitation/reclamation of mining sites after their closure. But there are lingering concerns over whether these funds are sufficient for financing the required works in such a way that they meet existing international best practice in the mining sector.

Recommendation 3.5:

*The Government should ensure that all mining enterprises, notably the State-owned entities, have developed a complete and adequate rehabilitation plan that is based on a realistic assessment of costs and that their financial statements include rehabilitation costs in accordance with the International Financial Reporting Standards.*

Statistics on environmental expenditure and green growth

The NSO produces and disseminates a wide range of environment-related statistical data. Among these, statistics on environmental expenditures in the government sector are lacking detail and completeness. Moreover, the usefulness of these statistics is reduced, due to the lack of sufficient methodological descriptions. Some areas, such as expenditures on air pollution control and reduction measures, are not covered at all. Also, environmental expenditures in the enterprise sector, such as the mining industry, are not covered. The NSO has so far not adopted an international classification of environmental expenditures (such as CEPA), which would facilitate the international comparability of national statistics. Another challenge is to develop statistics for the measurement of green growth indicators, which are designed, inter alia, for the purpose of gauging improvements in environmental and resource productivity and the extent to which economic growth has been decoupled from environmental degradation (SDG Target 8.4). First steps in this direction have been made, with the approval of the NSO in July 2017 of 38 green development indicators.

Recommendation 3.6:

*The National Statistics Office should:*

- (a) *Develop a statistical information system for environmental expenditures based on the existing international standard, viz. the Classification of Environmental Protection Activities and Expenditures (CEPA);*
- (b) *Develop data collection and estimation methodology for indicators designed to measure progress made towards the greening of economic growth and disseminate the outcomes to policymakers and decision makers;*
- (c) *Build the capacities of central and local government authorities to analyse and use statistical data for evidence-based policymaking.*





## Chapter 4

# ENVIRONMENTAL MONITORING AND INFORMATION

### 4.1 Environmental monitoring

#### *Monitoring networks*

##### Air

The first two air quality monitoring stations were established in Ulaanbaatar in 1977. A further four were added by 1979, 13 during the 1980s, three in the 1990s, 11 in the period 2000–2010 and three more since 2011. As of 2017, the national air monitoring network operated by the National Agency of Meteorology and Environmental Monitoring (NAMEM) consists of 36 air quality monitoring stations. However, one in Darkhan is not operational, bringing the total to 35 operational stations. Of these, only six are automated and they are all situated in Ulaanbaatar. In addition, five automatic monitoring stations are operated by the Air Pollution Reduction Department of Ulaanbaatar City (table 8.2). These stations were provided by an international donor in 2010 and provide near-real-time data 24 hours a day for five to six pollutants. Information regarding the air quality monitoring stations is available to the public on the EIC database (<http://www.eic.mn/>).

There are also 10 automated monitoring stations for dust storms.

Mongolia uses an air quality index to identify levels at which air pollution can cause risk or damage to human health. It comprises the following parameters: sulphur oxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), PM<sub>10</sub>, PM<sub>2.5</sub>, carbon monoxide (CO) and ozone (O<sub>3</sub>). The air quality index is generated using the automated stations' readings and is publically available on the internet (<http://agaar.mn/index>). The website also provides a list of actions that different sectors of society can take to participate in reducing air pollution. Furthermore, a mobile application displaying the air quality index at different locations in Ulaanbaatar is available to download from GooglePlay and iTunes. There are also several other air quality indexes that use different methods of calculation. However, the air quality index is valid only for Ulaanbaatar, which has automatic air quality monitoring and allows the sharing of near-real-time data (chapter 8).

Monthly air quality statistical data are also submitted to the NSO and made available to the public on its website (<http://www.1212.mn>). NAMEM also produces annual air quality reports using information from the monitoring stations within the national monitoring network. The reports are made publically available at <http://www.agaar.mn> and <http://www.tsag-agaar.mn>.

##### Surface water

NAMEM undertakes monitoring to determine the water quality of lakes and rivers, as well as the impact of discharges of urban wastewater. The Information and Research Institute of Meteorology, Hydrology and Environment provides data to NAMEM, which then reports this information to the Ministry of Environment and Tourism. The Information and Research Institute of Meteorology, Hydrology and Environment monitors water levels, temperature and quality in lakes and rivers, and also monitors river flows. There are 191 monitoring stations located in more than 94 rivers and 18 lakes.

Water quality is monitored on a monthly basis and temperature and water levels are monitored twice daily. The parameters observed are: pH, temperature (t), electrical conductivity (EC), O<sub>2</sub>, suspended solids (SS), nutrients (NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, P), detergents (dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), major ions (total dissolved solids (TDS), Fe) and heavy metals (Cu, Cr, Pb, Zn, Mn, Cd). Water quality monitoring is conducted in accordance with the international (ISO) and national (MNS) standards. Twenty-two laboratories are used to test certain parameters.

In the aimags, there are 40 output control points for wastewater, located at 20 WWTPs. In Ulaanbaatar, there are 15 output and input control points (of which seven are output control points) located at seven WWTPs.

Water quality monitoring data is processed on a monthly basis and annual reports are publicly available at <http://www.tsag-agaar.mn>. Despite a well-structured database being available at <http://www.eic.mn>, actual data on water monitoring

are hard to find and in some cases are not available. This is in contrast to a lot of supporting information, such as the location of monitoring sites.

### Groundwater

There are 287 approved water deposits/abstraction sites, 25 for drinking water and the remainder for industry and mining. There are 193 monitoring wells (boreholes), of which 28 are automated and continuously return data. Of these 28, 10 are operated by mining companies, three for drinking water in Ulaanbaatar and two at strategic mining sites. The remainder are manual and monitoring takes place once a month for drinking water and once per quarter for industrial use. For monitoring drinking water, there is a focus on the following key parameters: level, pressure, pH, temperature and electrical conductivity. For industrial uses, the same information is provided but with the inclusion of heavy metals and nutrients analysis.

The Ministry of Environment and Tourism has a groundwater monitoring system that allows Ministry staff to view up-to-date data from boreholes at some of the key industrial sites; both temperature and levels are measured and automatically transferred to the database. If water levels drop below agreed standards an alert is raised and the Ministry of Environment and Tourism can then speak to the relevant companies to take necessary action.

### Permafrost and glaciers

In addition, over 100 permafrost monitoring boreholes have been established to date; they are owned and operated by several different institutions. There are five glaciers in Mongolia and six automated glacier observation sites. Currently, assessment of the condition of the glaciers is only carried out periodically by the scientific and research communities and presented through research papers.

### Soil and land degradation

NAMEM operates the soil quality monitoring network and provides data to the Ministry of Environment and Tourism. Since 2000, soil monitoring has been undertaken every five years at 350 sites across the country. The variables tested include pH, ammonium (NH<sub>4</sub>), phosphorus oxide (P<sub>2</sub>O<sub>5</sub>), nitrate (NO<sub>3</sub>) and sulphate (SO<sub>4</sub>). Since 2011, annual monitoring of 11 chemical elements (cadmium, tin, mercury, bromine, chromium, copper, cobalt, strontium, rubidium, zircon and chlorine) was included at 102 sites in Ulaanbaatar and biannually at 85 local sites. The number of sites has increased and, in 2016, soil monitoring – for

agrochemicals and for chemical elements – was undertaken at 396 sites (102 in Ulaanbaatar on an annual basis and 294 at local sites biannually). Soil quality monitoring is conducted in accordance with the national (MNS) standard techniques and methodologies.

Since 2011, there are 1,529 sites where preliminary soil monitoring is undertaken every five years to assess the effects of desertification. The preliminary monitoring is based on 11 indicators: soil section morphological recording, degree of humidification, humus layer, pH, salt accumulation, soil degradation, sand accumulation on the surface, its depth, composition, density and permeability.

NAMEM produces an annual report on soil quality, which is made available online. Mongolian experts participate in international quality testing events organized by the Acid Deposition Monitoring Network in East Asia (EANET).

Challenges include insufficient soil analysis equipment and lack of human resources at the Central Laboratory of Environment and Metrology, as well as insufficient use of international methods and standards. Whereas a frequency of five years is common for soil monitoring, it is not sufficient for problematic sites where changes in chemical presences are expected.

### Noise and vibration

There is no official noise and vibration monitoring carried out under the remit of NAMEM or the Ministry of Environment and Tourism.

### Radioactivity

Mongolia's radiation monitoring started in 1972 using Russian DP-5A equipment. After 2004, the equipment was upgraded to RDS-110 equipment made in Finland.

As of 2017, the national radiation monitoring network monitors both gamma rays and beta particles in soils and air. The network comprises 35 background monitoring stations measuring dose concentrations twice daily. In addition, 26 of the 35 stations monitor beta levels in airborne dust once every 10 days.

NAMEM produces annual background level reports, and monthly averages are available on the EIC website through the Environmental Radiation Database. These data are used in reports of the Ministry of Environment and Tourism and posted on the Nuclear Energy Commission's website (<http://www.nea.gov.mn>).

There is one accredited laboratory in the country where testing, certification and calibration takes place.

Improvements to the radiation monitoring network could include more monitoring stations and the development and use of a real-time online system for monitoring in accordance with international standards and best practices.

### Biodiversity

The Ministry of Environment and Tourism is responsible for the monitoring of biodiversity and protected areas. In particular, the Institute of Biology of the Mongolian Academy of Sciences has an agreement with the Ministry to provide information on protected areas and endangered, rare and ecologically important species. Between 1987 and 2010, regular studies of ecologically and economically important species were carried out every four years; however, due to a lack of funding, this ceased in 2014 and no further species inventories have been undertaken since 2010. In 2010, species assessments of three different biomes were carried out by the Academy of Sciences, comprising steppe and desert species, mountain species and forest species (chapter 11). These regular species inventories were primarily used to inform quotas for hunting and to inform the national state of the environment report (SoER). Typically, rangers at the aimag and soum levels support the field work and observations by completing questionnaires and working with the scientists in the field.

The Academy of Sciences is the primary supplier of data to the Ministry of Environment and Tourism with a focus on science. Further data and information are provided by various national and international institutions and research and conservation organizations, the latter groups usually on a project basis. There is also evidence that well-funded projects deliver sound data and information (e.g. on conservation of the Gobi bear), thus allowing informed decision-making on specific issues of national and international interest. Despite the methodological and technical capacities of the Academy of Sciences to monitor biodiversity and produce assessment reports with recommendations, a lack of funding has resulted in the cessation of regular monitoring and reporting. In general, 2010 data are too outdated to inform evidence-based policymaking. The Ministry of Environment and Tourism collects data and engages scientific institutions to support the preparation of reports for some relevant multilateral environmental agreements (MEAs).

In cooperation with international partners, several Red List assessments have been undertaken. The first was

in 1987 and was updated in 1997. Further studies have been released between 2006 and 2011 (chapter 11). These include mammals, fish, reptiles and amphibians and birds. These studies provide useful information on the magnitude and importance of threatened biodiversity and help track endangered, vulnerable and threatened species.

The National Biodiversity Programme for the period 2015–2025 includes an objective to monitor alien invasive species; however, this is not being carried out at present. Occasional assessments are undertaken on aquatic life (requests are received every two to four years), often following specific requests by local authorities regarding the extraction of fish from specific waterbodies for commercial purposes.

While the relevant organizations contributing to biodiversity monitoring maintain their own databases, the EIC environmental database makes publicly available databases covering natural flora, fauna and state and local protected areas and provides a link to a password-protected database managed by WWF on wild animal and vegetation monitoring. The NSO, through its website and the Mongolian Statistical Yearbooks, provides limited information on forest land and harvest volumes, the number of rare animals allowed to be hunted and caught for "special purpose hunting" and sport fishing and the maximum limit of wild hunting for domestic purposes.

Challenges include insufficient funding for continued biodiversity monitoring and to strengthen the existing network at all levels, including coordination by the Ministry of Environment and Tourism, and increasing the availability of data and information to policymakers and the public.

### Forests

The Ministry of Environment and Tourism is now responsible for monitoring forests. Regular monitoring of forest areas and their changes, forest reserve and its changes, forest harvest, forest fires, forest rehabilitation, forest ownership and forest expenditure is undertaken with the help of rangers using checklists, and supported by periodic forest inventories. These checklists are passed in hard copy to the responsible person for forestry at the aimag level. The information is then entered into the EIC database as either statistical or geospatial information, depending on the type of data.

The first forest inventory was carried out in 1956 and a further inventory was prepared in 1974–1975, the latter specifically to support the development of the timber industry. The Forest Research and

Development Centre was established in 2012 to provide analytical and research support to the Ministry. It worked with GIZ to prepare the Multi-purpose National Forest Inventory (2014–2016) (chapter 13), which was published and is available in Mongolian and English. In addition, an online forest atlas was developed, which allows the user to select different layers and retrieve selected information. The database is held at the Centre. This information has been used to inform the national SoER.

#### *Analytical laboratories*

There are 22 laboratories of environment and metrology under NAMEM, one in Ulaanbaatar and one in each of the 21 aimags. As of 2011, there were 11 local laboratories (in Arkhangai, Bayankhongor, Darkhan-Uul, Dornod, Orkhon, Selenge, Zavkhan, Uvs, Khovd, Huvsgul and Uvurkhangai Aimags). Nine new laboratories (upgraded from local control points) were set up in 2012 (in Bayan-Ulgii, Bulgan, Gobi-Altai, Dundgobi, Dornogobi, Umnugobi, Khentii, Sukhbaatar and Tuv Aimags). A laboratory in Gobisumber was set up in 2012.

The Central Laboratory of Environment and Metrology in Ulaanbaatar supplies the necessary equipment to the local laboratories of environment and metrology and undertakes internal annual supervision of them. The Central Laboratory of Environment and Metrology received accreditation for testing of water-related parameters in 2009, 2012 and 2015. Eight other laboratories in the aimags are also accredited for water-related parameters (one in 2008, one in 2010, one in 2015, one in 2016 and four in 2017). For air quality, seven laboratories are accredited (Ulaanbaatar, Dornod, Selenge, Zavkhan, Uvs, Khentii and Uvurkhangai).

## **4.2 Availability of information on environment and sustainable development**

### *Data reporting by enterprises*

Self-monitoring is required according to the legislation for the different environmental media, as well as through the 2011 Government Resolution No. 311 on self-monitoring. Larger companies have dedicated units and the quality of their self-monitoring reports is better than others', but SMEs struggle. GASI inspectors check compliance with self-monitoring requirements and penalties are issued for non-meaningful self-reporting.

### *Statistical data*

The NSO is responsible for official national statistics and uses information supplied by the Ministry of Environment and Tourism supported by an official agreement (MoU signed in 2014) between the two institutions. Legislation is in place to mandate the production of official statistics and an amendment that will include the SDGs is currently awaiting approval. All statistics conform to international standards and are available on the NSO website. There are currently 24 environmental datasets available on the NSO's online database and the statistical methods and metadata are publicly accessible. In addition, yearbooks have been produced from 2003 onwards, in which there were 10 environmental datasets published up until the latest version in 2015, in which 16 environmental indicators are published. This shows a slow increase in the number of official environmental datasets that are available each year in the yearbooks, and that the yearbooks are publishing a subset of the total statistics available on the NSO's online database.

NSO has just started to implement the System of Environmental-Economic Accounting (SEEA) and so far have produced material flow accounts and physical supply and use tables for energy. The NSO is now looking at environmental protection expenditure accounts and environmental tax accounts. The work on accounting has not been published yet.

There are a few challenges related to the development and use of official environmental statistics, namely:

- The Ministry of Environment and Tourism lacks capacity to produce environmental statistics and this is reflected by the low number of statistics that are available, considering the data that exist;
- No water and waste accounts are developed;
- SEEA is not fully implemented;
- There are concerns about the quality of the data that the Ministry of Environment and Tourism provides to the NSO, and inconsistencies occur;
- The environmental questionnaire to support the gathering of statistics and a methodology to improve the assessment of environmental statistical indicators has not yet been submitted by the Ministry of Environment and Tourism for approval by the NSO Standing Committee.

In summary, there is a growing demand for environmental statistics due to the recent international

policy agenda, which includes, most notably, the SDGs, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction 2015–2030. This is in addition to the other reporting obligations required under MEAs and to meet national needs for state of the environment reporting. However, capacity, primarily within the Ministry of Environment and Tourism but also NSO (e.g. for implementing SEEA), is limited or weak. In addition, there are challenges with data quality and the need to make better use of international standards and best practices. Finally, collaboration between institutions is not strong enough and data exchange among governmental institutions is poor.

### *Databases*

The EIC currently maintains 29 core environmental databases that are publicly accessible through a dedicated website (<http://www.eic.mn>). These include databases on: land; soil; minerals; water; forests; flora; fauna; air pollution; environmental radiation; climate; natural disasters; hazardous and toxic chemicals; protected areas; legal information; EIA; environmental project and policy; environmental statistics; environmental finance; organization and human resources; metadata; livelihood compensation; compensation for environmental damage; geodatabase; desertification; environmental degradation and pollution; environmentally friendly technology; contaminated site registration; a link to the WWF password-protected portal (animal and vegetation monitoring); and community-based management and conservation.

The databases and their subdatabases are structured clearly and relatively easy to access. However, once the user arrives at the intended subdatabase, the availability of data is mixed and, in many cases, data are not available. In addition, with the exception of the meteorological information, there are no links from the environmental databases to social media to enhance sharing and stimulate discussion. The website tracks how many people access it but not specifically where they are from or other user data.

### *Environmental indicators*

The 2013 Framework for the Development of Environment Statistics (FDES) has 492 indicators; Mongolia can currently estimate 187 of them, leaving 305 unavailable. Further work will be required to increase the number of indicators that can be

calculated to support keeping the environment under review.

### *Indicators and information for the Sustainable Development Goals*

As of mid-2017, of the 103 environment-related indicators defined by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, Mongolia can produce 11. However, many of the indicators are Tier II (the indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries) or Tier III (where no internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested).

### *Application of Shared Environmental Information System principles*

The concept of a Shared Environmental Information System (SEIS) originated in Europe<sup>8</sup> and was established to improve the collection, exchange and use of environmental data and information, thereby strengthening the knowledge base on the environment. As such, the concept is not systematically applied in countries outside Europe. An SEIS comprises three broad pillars – content, infrastructure and cooperation – and consists of seven "principles" for information management. Mongolia performs relatively well regarding infrastructure and cooperation within the environmental constituency, but less well with "external" content (data availability and data quality) and cooperation. It has a central database that provides easy access to environmental information on the EIC website and also to datasets and information provided from other credible institutions and organizations that have a corresponding mandate. This information is available for multiple "uses" and multiple "users" and is managed close to the source of the information.

The Ministry of Environment and Tourism and NAMEM have also taken advantage of modern ICT to provide a basic web-enabled technical infrastructure. The transfer of information could be improved from soum to aimag and then to national level, where information is still being transferred by paper documents and also where greater opportunities exist to further automate aspects of the monitoring network (i.e. air, water, radiation) and the associated transfer of information via computers and web-enabled

<sup>8</sup> SEIS is a collaborative initiative of the European Commission together with the European Environment Agency (EEA) and the 39 countries of the European

Environment Information and Observation Network (EIONET).

technology. Cooperation appears effective where clear mandates, guidance and processes exist for those organizations and institutions that are providing environmental information; however, cooperation could be improved with other parts of government, in particular with the National Statistics Office. The first pillar, content, could definitely be improved, but ultimately this is based on the effectiveness of the monitoring network and the quality and quantity of the information it provides (i.e. on biodiversity). Using the SEIS concept and framework to guide the work of the Ministry of Environment and Tourism and relevant organizations and institutions that are responsible for monitoring, would lead to improvements in the sharing and use of environmental information.

*Environmental reporting, publication of environmental data, indicator-based assessment reports*

Environmental reporting and publication of environmental information occurs through several main channels. A selection of environmental statistics are available in the Mongolian Statistical Yearbooks and on the corresponding NSO website. Various thematic data and information is reported at different intervals: in near real time (air quality) and/or at monthly intervals (air, radiation and water), and/or on an annual basis (air, radiation, water, soil) and multi-annually (soil, biodiversity, forest inventories). These annual reports then feed into the Ministry of Environment and Tourism's biannual national SoER. Some of the underlying data are available and regularly updated by NAMEM on the EIC website and other portals, which are open to the public. The main users of environmental information and statistics are policymakers, research institutions and members of civil society.

The first SoER was produced in 1997. Currently, the Ministry of Environment and Tourism prepares and publishes the national SoER every two years – drawing from the information provided by NAMEM – to inform policy development and decision-making. All reports focus on the two years covered, with the exception of the 2015–2016 report, which looked at 30-year trends. The biannual national SoER is an indicator-based assessment, but is not based on the Driver, Pressure, State, Impact, Response (DPSIR) framework. The national SoER does not contain an easily understandable non-technical summary, but only general recommendations and conclusions at the end of the report.

*Linkages with other monitoring systems*

There is no system of environmental data and information shared with other relevant ministries, agencies and institutes.

### 4.3 Legal, policy and institutional framework

*Legal framework*

The 1995 Law on Environmental Protection defines environmental monitoring and provides the mandate for the central state administrative body (Ministry of Environment and Tourism) to establish and maintain an environmental monitoring network. The activities to be conducted through the environmental monitoring network include:

- Regular observations, measurements and surveys on the level of physical, chemical and biological changes to the environment and the level of pollution;
- Provision of information on the environment to the public and business entities and organizations;
- Development of proposals for the prevention of adverse effects on human health and the environment as a result of natural disasters.

The Law on Environmental Protection requires the Ministry of Environment and Tourism to establish an environmental information database or system comprising three components: soum and district databases; aimag and capital city databases; and the central state database. It defines the roles and responsibilities of different actors (soum governors, aimag governors, Ministry of Environment and Tourism) regarding submission of information as well as the schedule for submission of information.

The 1997 Law on Hydrology, Meteorology and Environmental Monitoring regulates the functioning of the national network of climate and environmental monitoring. It includes provisions on informing citizens of any meteorological and environmental conditions that may affect the population and the environment. The responsibility to provide citizens, business entities and organizations with such information and to organize work on preventing hazards and serious environmental pollution is vested with aimag, capital city, soum and district governors. Apart from the national network of climate and environmental monitoring, meteorological and environmental data may be submitted by licensed

citizens, economic entities and organizations, taking into account specific needs of the economic sectors such as agriculture, transportation, energy and tourism. The Law requires the Government to ensure full utilization of the climate and environmental monitoring information.

The 1997 Law on Statistics defines the scope, activities and coordination of the National Statistical System and describes the mandate, role, rights and obligations of the NSO and, to some extent, other producers of official statistics, as well as the requirements for organization of censuses and surveys and the publication of official statistics. The list of official statistical indicators in this Law includes the following environmental indicators: soil protection and damage; freshwater resources, water use, pollution, purification and wastewater treatment; air pollution; forest protection and rehabilitation; and number of protected animals and hunting.

Self-monitoring is regulated in detail by the 2011 Government Resolution No. 311, which foresees the designation of a person responsible for such work in an entity holding a permit or licence.

#### *Policy framework*

The 2002 Programme for Development of Water, Climate and Environmental Monitoring for the period until 2015 (2002 Government Resolution No. 182) was aimed at upgrading the national network of water, climate and environmental monitoring, improving the transmission and receipt of information through the network, and increasing the use of automated monitoring. The Programme was accompanied by an action plan for 2003–2005.

Extending the national network of measurements has been among the activities envisaged by the 2007 Programme on Development of Activities to Have Deliberate Impact on the Weather for the period until 2015 (2007 Government Resolution No. 96).

Unlike in other countries, there is no annual national environmental monitoring programme. Environmental monitoring is done based on annual plans, and is funded through the annual budget of the Ministry of Environment and Tourism, approved by the Government.

#### *Institutional framework*

The Ministry of Environment and Tourism is responsible for monitoring and the production of environmental information. In these tasks, the Ministry of Environment and Tourism is supported by NAMEM, which specifically monitors and reports on air quality, acid deposition, water resources and water quality, wastewater and soil pollution. Figure 4.1 details the organizational structure of NAMEM. NAMEM is responsible for data storage and receives the data on paper from the monitoring sites. The standards for monitoring are set out in technical documents. The Information and Research Institute of Meteorology, Hydrology and Environment is a subordinated organization of NAMEM. The EIC is part of the Institute.

The NSO is responsible for the production of official statistics. For environmental statistics it uses the information supplied by the Ministry of Environment and Tourism. Regarding the coordination between the Ministry of Environment and Tourism and the NSO, current legislation mandates the Ministry of Environment and Tourism to supply the NSO with environmental statistics and this is further supported and strengthened by an MoU signed in 2014 to streamline and improve data quality and expand the scope of environmental statistics.

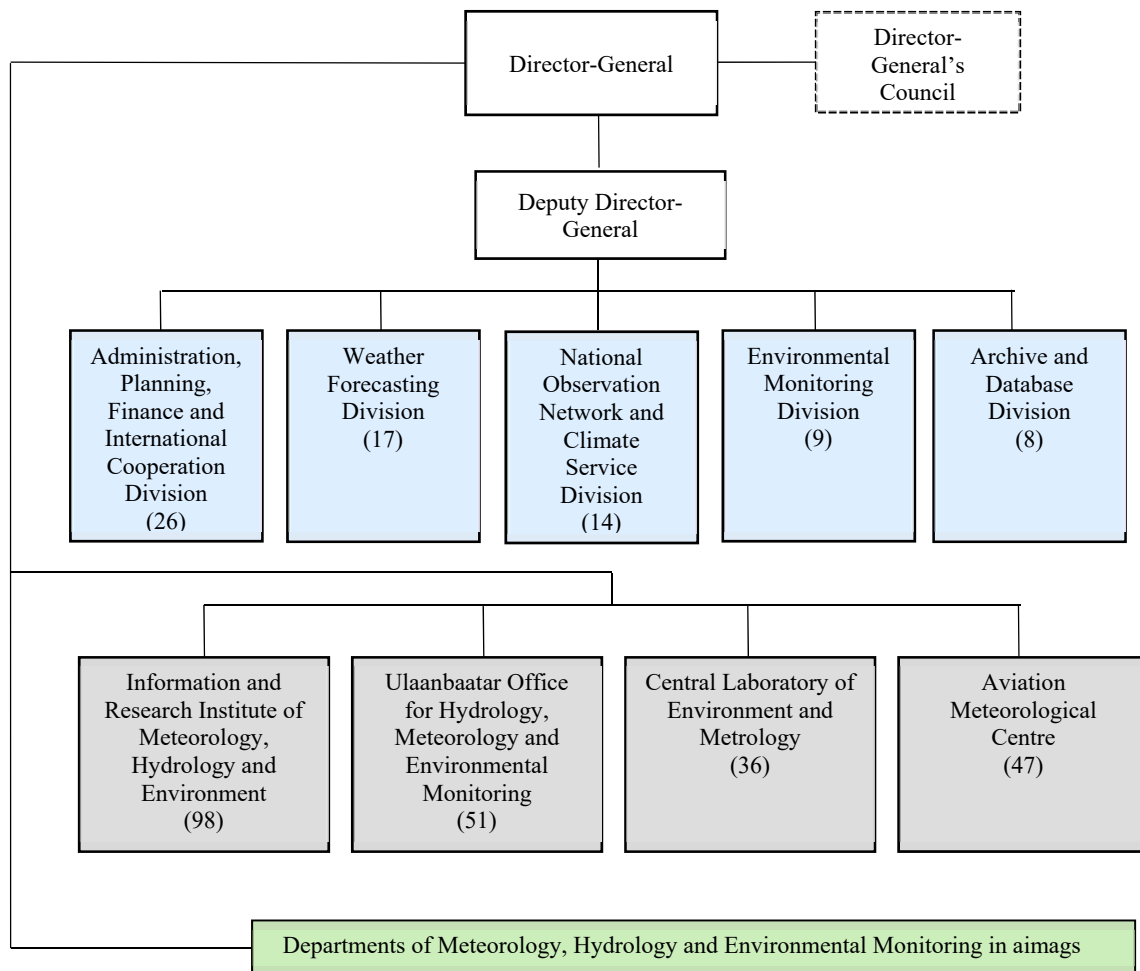
Other organizations and institutions involved in environmental data collection and statistics include: the Ministry of Mining and Heavy Industry; the Ministry of Construction and Urban Development; the Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC); NEMA; water basin administrations; PAAs; local administrative authorities at aimag, capital city, soum and district levels; rangers; and research institutions.

#### *Participation in international agreements and processes*

Mongolia has participated in some international projects and programmes, which has led to an increase in capacity for undertaking monitoring, testing and quality assurance procedures, including for water quality.



**Figure 4.1: Organizational structure of the National Agency for Meteorology and Environmental Monitoring**



Source: National Agency for Meteorology and Environmental Monitoring, 2017.

Note: Number of staff is indicated in parenthesis. The Director-General's Council is composed of heads of divisions of NAMEM and the Directors of the Ulaanbaatar Office for Hydrology, Meteorology and Environmental Monitoring, Information and Research Institute of Meteorology, Hydrology and Environment, Central Laboratory of Environment and Metrology and Aviation Meteorological Centre.

#### 4.4 Assessment, conclusions and recommendations

##### Assessment

The environmental monitoring network does cover the core environmental themes; however, it requires strengthening and some indicators are also lacking in the collection and reporting. In particular, there is no noise and vibration monitoring. The last nationwide assessment of species of different biomes was carried out in 2010, and was not repeated in 2014, due to the budgetary shortages.

A national SoER is produced every two years using key indicators. Information provided by EIC on the environment is readily available and easy to access. However, there is not enough focus on the other two pillars of SEIS, namely, content and cooperation. With

regard to content, there is a need to improve data quality and collection from soum to aimag to national levels. There is also a need to strengthen the cooperation between the Ministry of Environment and Tourism and the NSO to deliver environmental statistics in the context of the work to implement SEEA and in support of the follow-up and review required for the 2030 Agenda for Sustainable Development, Paris Agreement and Sendai Framework.

##### Conclusion and recommendations

##### Resources for environmental monitoring

Environmental monitoring would benefit from an increase in human and financial resources to strengthen the monitoring network. In particular, the regular nationwide assessment of species was not

repeated after 2010 and there is no noise and vibration monitoring. NAMEM laboratories lack capacity; some laboratories at aimag level lack accreditation for key parameters.

Recommendation 4.1:

*The Ministry of Environment and Tourism should strengthen the existing environmental monitoring network by:*

- (a) *Making available increased financial and qualified human resources;*
- (b) *Resuming regular nationwide assessment of species;*
- (c) *Developing noise and vibration monitoring;*
- (d) *Improving the capacity of laboratories on environment and metrology through further accreditation, new equipment and capacity-building.*

*See Recommendation 11.1.*

Data collection and sharing

There is insufficient capacity to produce and collect data from soum to aimag to national levels. International methodologies, standards and best practices for producing environmental indicators and statistics are not sufficiently applied.

Recommendation 4.2:

*The Ministry of Environment and Tourism, in cooperation with the National Statistics Office, should improve data quality, strengthen the use of methods and international standards for data collection, fill data and information gaps and improve the production of indicators and statistics by:*

- (a) *Improving inter-institutional cooperation and sharing of data between institutions and through different national levels;*
- (b) *Identifying priority data flows and environmental indicators that are required to fill gaps;*
- (c) *Building capacity for data collection and data quality control at the soum and aimag levels;*
- (d) *Improving natural resources inventories by using IT and GIS-based tools to get stronger, reliable data to populate relevant databases.*

State of the environment report

The Ministry of Environment and Tourism prepares and issues the national SoER every two years. Reports mainly focus on the two years covered, with the exception of the 2015–2016 report, which looked at 30-year trends. The reports are indicator based, but not

based on the Driver, Pressure, State, Impact, Response (DPSIR) framework. They do not contain a non-technical summary, but only general recommendations and conclusions at the end of the report.

Recommendation 4.3:

*The Ministry of Environment and Tourism should improve state of the environment reporting by:*

- (a) *Using the Driver, Pressure, State, Impact, Response (DPSIR) framework in order to be more connected with policy needs;*
- (b) *Including a non-technical executive summary in the state of the environment report to better inform stakeholders and decision makers.*

Environmental statistics

The Ministry of Environment and Tourism and the NSO lack the experience and capacity to produce good quality environmental statistics. Good quality environmental statistics is a prerequisite for compilation of environmental indicators, production of high quality state of the environment reports, and the implementation of the System of Environmental-Economic Accounting. They are also required for production of indicators in the follow-up and review of the 2030 Agenda for Sustainable Development. While the international community continues to work to agree on methodologies and standards for Tier III indicators, the Ministry of Environment and Tourism and the NSO could work together to prepare the appropriate surveys for Tier II indicators and move forward with data collection. This work could be done in parallel with implementing SEEA for air emissions, water, forests, wastes and energy.

Recommendation 4.4:

*The Ministry of Environment and Tourism and the National Statistics Office should:*

- (a) *Develop a roadmap for strengthening environmental statistics in line with the national and international requirements;*
- (b) *Implement the 2013 Framework for the Development of Environment Statistics and its Basic Set of Environment Statistics to compile environmental indicators, environment-related SDG indicators and environmental-economic accounting;*
- (c) *Provide training to their staff to increase their capacities to produce environmental statistics that are relevant for state of the environment reporting, the SDGs and the System of Environmental-Economic Accounting.*



## Chapter 5

# ACCESS TO INFORMATION, PUBLIC PARTICIPATION AND EDUCATION

### 5.1 Access to environmental information

#### Access through the Internet

#### *Scope of environmental information*

The scope of environmental information is defined in the 2008 amendment to the 1995 Law on Environmental Protection, which refers to environmental information being part of the state databases. The list includes most of the elements of the environment, such as land and soil, subsoil and minerals, water and mineral water, forest, flora, fauna, air and air pollution, and climate. In addition, it includes factors/issues such as: natural disasters, hazardous and toxic chemicals, waste, special protected areas, environmental law, EIA, implementation of environmental policies and programmes, environmental statistics and reports, budget and costs of environmental protection measures, organizations and human resources operating in the environmental sector, metadatabase, and other environmental information. At the same time, factors/issues such as energy, noise and radiation, and cost-benefit and other economic analysis and assumptions used in environmental decision-making, are not part of the explicit scope of environmental information, unless considered to be included in the category of "other environmental information". Also, issues related to the state of human health and safety, the conditions of human life, and cultural sites and built structures, in as much as they are or may be affected by the elements of the environment, are not included explicitly in the scope of environmental information.

#### *Active access*

Active access to environmental information refers to the obligation of governmental authorities to collect and disseminate information of public interest.

No surveys, assessments or reviews were conducted by the Ministry Environment and Tourism or other governmental or non-governmental stakeholders to assess the level of environmental awareness of the public and the related needs for and interest in environmental information.

At the national level, open Internet access to environmental information for the public is not provided by default; the information becomes available and accessible following an official decision of the Ministry. It is not clear whether providing public access to information entails any kind of security or risk assessment before the information is released.

The website of the Ministry of Environment and Tourism ([www.mne.mn](http://www.mne.mn)) provides information related to the activities of the Ministry and, sometimes, the environment-related activities of other governmental institutions. The content of the website is prepared by the Ministry's Media Office. About 3,000 to 4,000 users per day visit the Ministry's website, with the section on licences and permits being the most visited. The website has been operational for the past 10 years; its interface is updated every three to five years. As no historical statistical records are available regarding the website content and maintenance, it is not possible to measure progress in its development.

The key platform for providing access to environmental information is the EIC, which currently maintains 29 core environmental databases, publicly accessible through a dedicated website (<http://www.eic.mn>) (chapter 4). The Ministry of Environment and Tourism also provides access to a few databases, such as those on forest management, forestry, water and land, on its website. The Ministry of Environment and Tourism is the authority that approves the list of publicly available and free information, and of the information that is provided for a fee.

Other institutions, organizations and initiatives providing information related to the environment on their websites include the National Agency for Meteorology and Environmental Monitoring (<http://namem.gov.mn>), the Mongolian Agency for Standardization and Metrology ([www.masm.gov.mn/](http://www.masm.gov.mn/)), the National Legal Institute (<http://legalinfo.mn/>), the NSO ([www.nso.mn](http://www.nso.mn) and [www.1212.mn/](http://www.1212.mn/)) and the Mineral Resources and Petroleum Authority (<http://edu.mrpam.gov.mn/>). NAMEM produces early warnings regarding disasters

through its National Remote Sensing Centre (<http://icc.mn/index.php?content=58/>).

In its efforts to mobilize public participation in promoting enforcement of legislation and increasing consumer oversight, accountability and knowledge, GASI (chapters 1 and 2) provides the opportunity for the public to provide feedback. GASI has developed 14 user checklists (feedback forms), which can be filled in online (<http://home.inspection.gov.mn/>). The checklists cover the areas of food production services, health, labour and social security, and construction and metrology.

The current practice and procedures in other governmental institutions for providing environmental information to the public and conducting awareness-raising activities related to environmental concerns are rather fragmented. There is some evidence on certain institutions, e.g. the Ministry of Mining and Heavy Industry posts on its website general information about its response to requests and complaints from the public since 2016.

At the aimag level, information is provided on the aimag government website, e.g. Selenge Aimag (<http://selenge.gov.mn/beta/64/all>); Arhangai Aimag (<http://arkhangai.gov.mn/>); Cobi-Altai Aimag (<http://govi-altai.gov.mn/>); Bayan-Olgii Aimag (<http://www.bayan-olgi.gov.mn/>); Darkhan Aimag (<http://darkhan.gov.mn/>); and Dornod Aimag (<http://www.dornod.gov.mn/>). Most aimag government websites have a similar structure and content and provide some environmental information. However, the frequency of posting such information is low, and often the links either do not work or lead to pages with scarce or unrelated information.

At the local level (soum and bagh), no information is provided on the state of the environment in general or on water and air quality, and the impact on human health, in particular.

### Television

Several TV stations broadcast environment-related programmes weekly or more often. Eleven of 42 TV channels of the nine TV providers broadcast programmes related to the environment and tourism – some 33h 30min per week in total, ranging from 15min to 11h per channel (based on TV programming for week 41 in 2017). In addition, an ECO channel used to broadcast environment-related programmes; however, its content changed recently and it no longer includes such programmes. The reason for the decrease in environment-related programmes could be

linked to a decline in public interest in watching such programmes, possibly due to their scope and quality.

TV stations are not sufficiently used to inform the public about environment-related issues and concerns, although these could be an efficient means in Mongolia, given that nomadic families have good TV satellite connection throughout the country. The total number of cable TV users has increased from 89,689 in 2007 to 458,735 in the third quarter of 2017. At the local level, TV broadcasts are not used to transmit information about public consultations organized as part of EIA for mining, construction or other projects planned in the area, with a view to offering an opportunity for participation and better engaging the nomadic population in decision-making.

### Dissemination of environmental information by business

The Government is making some effort to encourage the disclosure and active dissemination of environmental information by business entities. Since 2006, Mongolia has been implementing the Extractive Industries Transparency Initiative (EITI). The mining companies are required to post on their websites all the statistics related to their activities, which are then provided on the EITI website. Joining EITI helped Mongolia improve access to information, which led to strengthening public oversight of local mining operations. The failure of the the Ministry of Environment and Tourism to release information on mining rehabilitation deposits made by the Environmental Protection Special Fund is of concern as it is hindering the transparency of information (box 2.1). Another concern is the unwillingness of mining companies to post the same information on their own websites. However, Government efforts to encourage the disclosure and active dissemination of environmental information by business entities are at their very inception and are not sufficiently visible in sectors other than mining.

### Other

A number of non-governmental international initiatives also provide information related to the environment on their websites (e.g. Publish What You Pay ([www.publishwhatyoupay.org/members/mongolia/](http://www.publishwhatyoupay.org/members/mongolia/))).

### *Passive access*

Passive access to environmental information refers to the right of the public to seek information from governmental authorities and the obligation of the

authorities to provide information in response to a request.

Two types of public requests for environmental information can be identified: requests for information related to the environment, and petitions and complaints. Requests for information are regulated by the 2011 Law on Information Transparency and Right to Information. The petitions and complaints are handled in accordance with the 2015 Law on General Administrative Procedures.

#### Requests for information

The 2011 Law on Information Transparency and Right to Information includes provisions governing access to information in general, including the procedure for requesting information, release of information, service fees, and on prohibition of release of certain information. In accordance to the Law, public (citizens and legal entities) requests for information should be answered within seven working days, which may be extended by another seven days if producing the requested information requires more time. Requests for information that is in the possession of other organizations should be transferred to the relevant organizations within two working days and the requester should be informed of this. Also, the Law specifies that requests to which a response can be provided immediately shall be resolved and responded to immediately.

#### Complaints

A citizen or legal entity that considers its lawful right to information was infringed can file a complaint to an upper level body, either the sectoral organization (the Ministry of Environment and Tourism) or the National Human Rights Commission of Mongolia, or to the court. Complaints submitted to upper level bodies are regulated by the 1995 Law on Resolving Complaints made by Citizens against Civil Servants and State Bodies, the 2015 Law on General Administrative Procedures and 2002 Law on Civil Procedures. Complaints filed with the National Human Rights Commission are reviewed under the 2000 Law on the National Human Rights Commission. Complaints filed with the court are reviewed under the Law on General Administrative Procedures and Law on Civil Procedures.

The Ministry of Environment and Tourism handles complaints and petitions from the public in accordance with the Law on General Administrative Procedures. In accordance with this Law, complaints must be

responded to within 30 days. An extension of another 30 days can be granted for complaints for which more time is required to collect the required information.

#### Implementation practice

The Ministry of Environment and Tourism provides responses to public requests in writing, orally and in person when a more detailed explanation is required, depending on the nature of the request and the mode in which it was made. To facilitate the submission of petitions, complaints and requests from the public, the Ministry has placed a special box in a room located at the entrance of the Ministry, before the security checkpoint.

A record of public requests, petitions and complaints is kept by the Ministry's registration desk. Petitions and complaints that require urgent attention are handled by a dedicated official, while requests for environmental information undergo a common process of registration and dispatch to the relevant departments, depending on the content and nature of the request.

Special procedures can be applied when serious complaints are received. Such complaints are stimulated by a system of financial compensation (e.g. in the form of a share of the fine imposed) to citizens who inform the authorities of illegal activities (chapter 1). In the case of a serious complaint, a working group is established with the participation of the police, the Ministry of Environment and Tourism, other relevant ministries, local authorities and NGOs. The working group reviews whether the reported non-compliance is actually happening, within the deadline of 14 days established for complaints. For complex issues, the deadline can be extended for another 14 days.

Based on the statistics provided by the Ministry of Environment and Tourism, the Ministry's response rate to 308 requests, petitions and complaints in the last quarter of 2016 was 70 per cent, while NAMEM's response rate to 111 requests, petitions and complaints in the same period was 98 per cent. In the first two quarters of 2017, 313 requests, petitions and complaints were received from citizens, business entities and organizations, addressed to the Ministry of Environment and Tourism and its affiliated institutions. The response rate was 85 per cent, with responses pending to 47 requests, which were still being reviewed as of mid-2017. At the same time, it is not clear whether the 2-, 7- and 30-days deadlines are met diligently.

### Other aspects

Requests made from the local level (aimag and soum) are directed by the Ministry of Environment and Tourism to aimag authorities, namely, to the aimag's environment and tourism department. Responses to such requests and complaints must be provided within 30 and 14 days, respectively.

In addition, the Ministry of Environment and Tourism receives proposals from the public on how to improve environmental protection in various areas. For instance, in 2016, a number of suggestions were received from the public on how to improve environmental protection from mining and exploration activities and from illegal logging.

#### *Limitations to access to information*

In accordance with its Law on Information Transparency and Right to Information, Mongolia applies limitations to access to information on the basis of:

- Special circumstances (protection of national security and public interests; matters under review concerning competition or specialized inspection; secrets of State, organization and person under enquiry, investigation and prosecution; concluding international agreements; and any other information that might be specified in other national laws);
- Protection of intellectual property;
- Protection of personal secrets;
- Protection of an organization's or business entity's secrets.

At the same time, the 1995 Law on Privacy of Organizations defines that the following information is not permitted to be secret:

- Information that shows the impact of an organization's activities, production, services, techniques and technology on public health or the environment;
- Information on all types of toxic and radioactive substances that may be in the possession of the organization, which may harm public health or the environment;
- Information about a crime or whether it should be disclosed to the public in accordance with the national legislation.

There are no restrictions for filing a petition, which typically has the nature of a complaint, i.e. anyone can file a petition. There is an annual review assessing how the petitions are handled.

### *Charges*

The Law on Information Transparency and Right to Information stipulates that certain service fees shall apply for receiving information, the amount of which should be set by the management of the organization concerned and that service fees for requesting information should not exceed the direct costs of copying, postal delivery, etc. related to giving such information. The Law also provides for discounts and waivers that shall be approved by the Government.

In the case of the Ministry of Environment and Tourism, requests to obtain environmental information are free of charge when the requested information is available in reports or publications, which are then provided by the Ministry upon receiving an official request. However, in the case of more complex requests for particular data on the environment (e.g. on transboundary watersheds) requiring the collection of specific data, the Ministry may not have the capacity to do so and may not be in a position to fulfil the request. Requests to NAMEM for multiyear data on air quality can be responded to upon payment (a rate is applied per digit of data). If the request asks for information about a person or a company, such information is considered confidential and is not provided to the requester. It was not feasible to assess the costs and procedures to obtain access to information held in other governmental institutions.

#### *Challenges for implementation*

Overall, the legislative framework regulating access to environmental information is in place and evolving; nevertheless, adequate implementation by both the Government and the public remains a challenge. The Government lacks resources to set up an efficient and effective structure to handle public requests within the deadlines of two, seven and 30 days. The public lacks knowledge both of its rights to information and the procedures provided in the law to enable people to exercise those rights and of existing mechanisms established by the authorities that hold environmental information. This is particularly evident in light of the many changes to the legislation and procedures undertaken since 2012.

The current operational mechanism in the Ministry of Environment and Tourism, with a registration desk handling requests and petitions, is not functioning smoothly. In particular, there is room for improvement in the monitoring of responses provided to the public. The Ministry has not undertaken any comprehensive review of the process, including the time taken to provide each response (at present, the Ministry's website provides the rates of responses in terms of

time taken and delayed, without specifying the duration of delivery of a response).

Another concern is the scarce online availability of information on the state of the environment, including raw and aggregated data and metadata.

## 5.2 Public participation in decision-making on environmental matters

### *Environmental NGOs*

Of 16,609 NGOs registered with the General Agency for State Registration, 487 are registered as environmental NGOs (as of August 2017). According to the Ministry of Environment and Tourism, only about 100 environmental NGOs are active.

There are rather many "briefcase NGOs", i.e. artificial non-profit organizations set up by only one or two persons only to obtain money from donors but having no programmes on the ground. It is also very common for former governmental employees to establish NGOs.

In addition, 90 international NGOs, including 11 in the environmental field, operate in the country.

The authority to register NGOs was given to the General Agency for State Registration in 2015. The NGOs registered before 2015 by the Ministry of Justice were required to reregister and provide additional information, some of which was difficult to

obtain, thereby hindering the reregistration of NGOs. This has affected all types of NGOs, including environmental ones. The number of registered environmental NGOs diminished from 706 in 2014 to 487 in 2017, although this decrease might be partially attributed to the number of NGOs that ceased functioning and therefore were not present to reregister. The General Agency charges a one-time registration fee of 44,000 tugriks (approximately US\$20) to all newly established NGOs. No fee is charged for reregistration.

There are a number of environmental NGO coalitions and movements in the country (box 5.1). Organizing themselves within coalitions and movements helps NGOs to conduct activities in a more targeted and efficient manner.

Cases of harassment of environmental activists for their environmental activities still occur. It is not clear what actions are being taken by the Government to prevent such cases from occurring and to ensure proper investigation to avoid suspicion of covering up. The case of a conservation ranger who worked with the Mongolian Snow Leopard Conservation Foundation, and whose body was found in November 2015 in Lake Khuvsgul, was ruled by the police as suicide by drowning; however, over the preceding two years the ranger was attacked on at least three separate occasions, apparently as a result of his efforts to enforce protected area laws at Tost Uul (a mountain range in the Altai Mountains in the Gobi Desert).

### **Box 5.1: Environmental NGO coalitions and movements and the outcomes of their activities**

A number of NGO coalitions and movements on the environment are active in Mongolia. Some NGOs are part of several coalitions.

The Mongolian Environmental Citizens Council was established to facilitate the involvement of the public in drafting laws, regulations and policies. It works in close cooperation with the Ministry of Environment and Tourism and delegates its representatives to various working groups established by the Ministry to draft environmental legislation. Its membership includes 140 organizations.

The Publish What You Pay Coalition (PWYP Coalition) in Mongolia was launched in 2006. It has focused its efforts on the effective implementation of the EITI, but also works on legislative processes around the natural resources framework and with communities at the subnational level. The coalition has led campaigns to ensure transparency at all stages of mining production and increase public engagement and debate on natural resources issues. The coalition's membership includes 29 organizations.

Active participation of the United Movement of Mongolian Rivers and Lakes, which brings together 11 river movements protecting water basins from the impact of gold mining activities, was instrumental in the development and adoption of the 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas.

Another example of the active involvement of civil society in the area of water protection is Save Our Queen Tuul River National Movement. The Movement is engaged in, inter alia, demanding the Government cancel licences enabling mineral exploration alongside the Tuul River, as the river has reportedly been severely affected due to explorations that are not in line with the 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas.



In another case, four members of a local community in Govi-Altai Aimag were taken to court in 2013 by a mining company on charges of defamation for briefing a government working group on the negative impacts of the mine on their community.

In addition to harassment of environmental activists by business entities, there are cases of pressure having been put on environmental activists by the Government. One example is the arrest in 2013 and subsequent terrorism sentence for an environmental activist who campaigned to protect water sources from mining pollution.

#### *Public participation in decision-making on planned projects*

Public participation in EIA is provided for by the legislation (chapter 2). However the mechanisms to ensure public participation in decision-making on projects are not sufficiently effective. The legislation providing for public involvement in EIA does not take into account the specificity of vast territories and the way of life of nomadic communities, resulting in their poor engagement in consultations about projects planned in their areas. For instance, the 30 working days required for consulting the public on planned projects (in the case of a detailed EIA) is not sufficient to allow for proper organization of consultations, especially in summer, when the nomadic families are constantly on the move to new pastures. Local authorities at bagh level and NGOs operating in the project area often lack capacity and knowledge of how to proactively engage the public in consultations. Company representatives in charge of public relations commonly lack the necessary knowledge and skills to ensure an effective consultation process.

Mobile phones have become widespread; during the last 10 years, the total number of mobile phone subscriptions increased more than threefold, from 1.1 million in 2007 to 3.6 million in the third quarter of 2017, which indicates that there are almost 120 subscriptions per 100 citizens. However, the cell phone network is not efficiently used as a mechanism to communicate details about forthcoming consultations with the public. In addition, local TV channels are not commonly used to brief the public in advance about planned projects, inform the public of the results of EIAs, and raise awareness of the public's rights and procedures for engaging the public in decision-making on planned projects.

In rather rare cases, when members of the public manage to organize in such demanding circumstances, they have the chance to successfully pursue their interests (box 5.2).

#### *Public participation in permitting*

There are no provisions in the legislation concerning public participation in permitting (chapter 2).

#### *Public participation in strategic environmental assessment*

Public participation in SEA is regulated by the 2012 Law on Environmental Impact Assessment and the 2014 Order of the Minister of Environment and Green Development No. A-03. However, as of mid-2017, no SEA has ever been done, so there is no experience with public participation in this procedure (chapter 1).

#### **Box 5.2: Camel herders defend their rights**

In 2012, a group of camel herders, with the assistance of two Mongolian NGOs (Gobi Soil and Oyu Tolgoi Watch), filed a complaint with the Compliance Advisor/Ombudsman, the body tasked with resolving disputes with local communities affected by International Finance Corporation investments. The herders claimed that the development of the Oyu Tolgoi copper–gold–silver mining project was threatening their livelihoods, health and culture.

The negotiations lasted four years (October 2012–May 2017) and was mediated by the World Bank's Compliance Advisor/Ombudsman. This resulted in more than 50 separate commitments on the part of Oyu Tolgoi LLC and the Government, a co-owner of the mine. The Accountability Counsel (a non-profit organization based in the United States) supported the herders through the complaint process with legal advice and negotiations training.

The agreement, which still needs to be implemented, provides for a number of benefits for the herder communities and the environment, including the construction of new wells and maintenance of existing ones, development of a pasture management plan, improved monitoring of the impacts of the mine's operations, a review of compensation packages and expansion of the eligibility criteria to include more herders, introduction of a fodder planting programme and improvement of health services for herders.

*Public participation in law-making*

To involve the public in preparing laws and policies, the Ministry of Environment and Tourism works closely with the Mongolian Environmental Citizens Council by involving its representatives in the working groups that are established for developing laws, regulations and policies. A group called Green Parliament was created within the Council to enhance NGOs' contribution to drafting the legislation. The Council also takes part in the meetings of standing committees in the State Great Khural. However, not all civil society organizations are part of the Mongolian Environmental Citizens Council. Such organizations (e.g. the National Association of Natural Protection Cooperatives, Community User Groups – forestry, water and herders) are engaged with and involved directly in the work of various working groups depending on the theme of the legislation under development. A challenge is that, often, proposals and comments made by NGOs on the draft laws and regulations are not taken into account, and even when they are included in the drafts, many are being gradually removed at different stages of draft law review in the Ministry of Justice and the State Great Khural. Another bottleneck is the lack of expertise and knowledge in legal matters to enable NGOs to provide high quality proposals and comments on the draft laws and regulations.

To ensure public participation in law-making, the 2015 Law on Legislation (which came into force in January 2017 and was revised in May 2017) stipulates that drafts of new or revised laws and secondary legislation should be subject to public consultation by being available for comment on a website for 15 days. The response provided to each person who comments must be posted on the website within 30 days of the last day of the public consultations period. The Law also stipulates that NGOs and other public associations affected by the new or revised laws and regulations should be consulted. The period of 15 days fixed for public consultations in such a vast country is very short to allow for effective consultations.

*Public participation in developing standards*

When the Agency for Standardization and Metrology develops new standards, the draft standards are posted on the Agency's website to enable public comment ([www.masm.gov.mn](http://www.masm.gov.mn)).

*Public participation in decision-making on genetically modified organisms*

The National Biosafety Committee headed by the Minister of Environment and Tourism has the

responsibility of overseeing activities related with biosafety and GMOs in the country (chapter 7). In addition to governmental representatives, the Committee's membership includes representatives of scientific organizations and NGOs. Other than that, there are no special provisions or mechanisms in the legislation concerning public participation in decision-making regarding the release of GMOs.

*Public participation in the use of environmental funds*

Citizens can submit proposals concerning the use of environmental funds, including from the Environment and Climate Change Fund (chapter 3). However, it is the Fund's Board (chaired by the Minister of Environment and Tourism), who makes decisions on the use of funds. Representatives of NGOs and user group associations are included in the Board.

*Public participation in international decision-making on the environment*

NGO representatives are rarely included in the national delegations to international environmental forums and meetings and very seldom are they involved in the preparation of the Mongolian position for these meetings (chapter 6). There is no formal and regular procedure for involving stakeholders and civil society representatives in the preparation of the country's position before international negotiations (chapter 7). There are cases of the involvement of NGOs in the preparation of national implementation reports; however, there is no formal procedure in this respect, so the practice varies.

*Community-based approach to environmental protection*

Mongolia is strong in advancing the community-based approach to environmental protection. In addition to NGOs, there are various user groups and cooperatives that provide further opportunities for public participation. These include forest user groups (chapter 13), disaster protection groups (chapter 14), mining cooperatives (chapter 1), herder cooperatives and community-based administrations of protected areas (chapter 11). Since 2015, cooperatives and user groups meet every two years in a national forum. At their second forum, some 1,000 participants representing about 800 cooperatives and user groups addressed community-based environmental protection.

### 5.3 Access to justice in environmental matters

There are three types of judicial authority: criminal court, civil court and administrative court. There are no courts that specialize in environmental cases. Other institutions, such as an environmental ombudsperson to whom members of the public and NGOs could address their complaints related to environmental matters prior to or instead of going to court, do not exist.

For environmental administrative cases, a citizen can access the court directly or be represented by an environmental NGO. Members of the public and NGOs can challenge both the substantive and procedural aspects of a decision related to environmental matters, including those that "contravene provisions of national laws relating to the environment". NGOs whose charter purpose is to protect the environment are entitled to address the courts to claim environmental damage.

The average duration of a court case on environmental matters is about four months, including up to two months for the first stage, and 30 days for each of the second and third stages. All court decisions are publicly available on the website <http://new.shuukh.mn/>.

When a case is submitted by citizens or NGOs, the Ministry of Environment and Tourism is usually invited to provide expertise in the court.

#### *Legal aid*

Free (Government provided) legal aid for members of the public and NGOs in relation to their exercising their environmental rights in courts does not exist.

There are about 20 lawyers specializing in environmental cases. All are members of the Mongolian Lawyers Association Environmental Branch, formed in 2016.

#### *Training of judges*

Judges do not receive training on environmental matters. There are no judges specializing in environmental cases.

#### *Costs*

The overall financial costs for filing and pursuing cases in court, including environment-related cases, are too high to allow the public fair and just access to justice in environmental matters.

The state stamp duty fee is governed by the 2010 Law on Stamp Duties and provides that citizens and NGOs should pay state stamp duty. The duty is rather high, thus discouraging appeal to the courts.

Financial costs for going to court vary, depending on the case. An initial submission to a court is relatively affordable (e.g. filing a case with the administrative court costs 70,000 tugriks (approximately US\$29)). The price increases considerably with the expenses required for investigating and gathering evidence, resulting in some cases not being pursued further because of these costs. According to the 2016 Law on General Administrative Procedures and 2016 Law on Decisions on Administrative Cases in Court, the party who is found guilty must cover all the expenses incurred in the case; however, this is applied after finalization of the court case. During the court procedure, the claimant covers all expenses related to the case – where there are high cost implications, they may not be able to afford to continue the case. Unless special fundraising is undertaken, many, if not most, of the environmental cases are not pursued in court due to the excessively high overall costs. Another relevant factor is the long period required to pursue a case, including appeals, etc., which can take four years or longer.

In accordance with the 2016 Law on Decisions on Administrative Cases in Court, costs for court procedures can be waived during the case if the claimant is representing the public interest. Such costs should be absorbed by the Government and then be reimbursed by the party found guilty. However, this legal provision is not applied in practice due to resource constraints. Furthermore, there is an element of corruption, in particular, for cases relating to mining activities by powerful companies that put pressure on the public and on the courts.

### 5.4 Integration of environmental education and education for sustainable development into curricula

In 2016, almost two fifths of Mongolians (39.2 per cent) were younger than 21 years old. Mongolia has nearly universal coverage in primary education and an 86 per cent net enrolment rate in secondary education. Due to Mongolia's vast geographical size and its extremely low population density, the educational system is dependent on boarding schools for children from the countryside.

The process of integration of education for sustainable development (ESD) into curricula has intensified in recent years, following the adoption by the then Minister of Education, Culture and Science of Order

No. A/458 of 13 November 2015, specifically dedicated to incorporating the ESD concept into the training and activities of general secondary schools. The curricula for lower and upper secondary education (160 curricula in total) have been revised to integrate ESD and are in use in all schools. This work advancing the ESD concept has been implemented in the framework of the ESD Project co-financed by the Government and SDC (box 5.3).

Overall, the main challenges for integration of environmental education (EE) and ESD into curricula include:

- Enabling consistent and adequate implementation of the new curricula in all schools across the country;
- Ensuring training and developing teachers' knowledge of ESD, environmental protection and sustainable and green development issues;
- Developing efficient methods to increase young people's knowledge of the environment and sustainable development;
- Developing the capacity in ESD of all staff of the Ministry of Education, Culture, Science and Sports and its affiliated institutions;
- Providing sufficient resources for implementation activities and further development and research activities in ESD.

### *Preschool*

Preschool education is optional. Its purpose is to provide children (2–5 years old, representing 9.8 per

cent of the total population) with supportive care and protection, and to develop and train them in the skills necessary to support their basic lifelong education.

During the last 10 years, the number of kindergartens nearly doubled, from 742 in 2006 to 1,327 in 2016. Nevertheless, one of the key challenges is to enable access to preschool education for children from the countryside and especially from nomadic families. The programme on mobile ger kindergartens established by the Ministry of Education, Culture, Science and Sports with support from UNICEF and other NGOs, such as the Global Partnership for Education, aims to help improve the access and quality of preschool education for children from nomadic families. As a result, 64,571 more children were enrolled in kindergarten between 2010 and 2015.

Integration of EE and ESD into the curriculum and training programme of preschool education is at the inception stage, targeting mostly children aged 4–5 years. The curriculum includes elements related to the environment, such as exploring nature and the surrounding environment, discovering new things and experimenting with them, learning to love, enjoy and protect nature, plants and animals, and learning to adapt to everyday life. Preschool education includes conducting simple experiments engaging children and raising their awareness of waste and the importance of a clean environment to live in, also by involving adults in such activities. In their training, children use products of nature, such as leaves, as well as traditional items, such as ankle bones.

#### **Box 5.3: ESD Project**

With the implementation of the ESD Project (first phase, December 2014–December 2017), Mongolia started to integrate ESD in its formal and non-formal education system. The second phase of the project (2018–2021) is under preparation.

The overall goal of the project is to integrate ESD into the Mongolian school system, and to support the development of an institutional, legal and organizational framework for sustainable and green development. The project focuses on reforming the formal education system at all levels and aims to have ESD integrated into the curriculum of all 628 general secondary public schools. In addition, activities are carried out to increase the awareness of leaders and the public on ESD, sustainable and green development, and to support selected companies and organizations to be certified in accordance with ISO 14001.

Key results of the first phase of the project include its contribution to developing several ESD-focused orders of the Minister of Education, Culture, Science and Sports, conducting numerous training events for teachers and organizing training for relevant staff of the Ministry of Education, Culture, Science and Sports and the Ministry of Environment and Tourism. The project also contributed to development of relevant training materials (handouts and teaching materials), for both the formal education system and non-formal education.

The main institutions involved in formal and non-formal education, such as the Ministry of Education, Culture, Science and Sports, Ministry of Environment and Tourism, Mongolian Institute of Educational Research, Institute of Teachers Professional Development, National University of Mongolia and Mongolian National University of Education, participate in a working group overseeing the project's implementation. The project is co-funded by the Ministry of Education, Culture, Science and Sports, Ministry of Environment and Tourism and SDC. It is managed by GIZ, Uppsala University and the Institute for International Cooperation in Education of the University of Teacher Education, Zug, Switzerland.

**Photo 5.1: Abacus made of traditional material (sheep ankle bones)**

Regarding advancing the integration of ESD into preschool education across the country, the competences in ESD of educators and other kindergarten staff are not sufficiently developed, in particular, to ensure the use of ESD methodology in organizing and conducting activities at the preschool level.

#### *Primary school*

Primary school is compulsory and includes five years of study for children aged 6–10 years (9.6 per cent of the total population). The Government takes measures to address the dropout problem, which is still one of the biggest challenges in the education system. The total number of pupils aged 6–14 who drop out has decreased by a factor of 10, i.e. from 12,343 in 2006 to 1,169 in 2014. The international community provides important assistance in that regard. For instance, the World Bank project Improving Primary Education Outcomes for the Most Vulnerable Children in Rural Mongolia, with a total budget of US\$2.46 million, implemented in the period 2012–2017 by the Mongolia Programme Office of Save the Children Japan, contributed to reducing the number of school dropouts and improving children’s learning results.

In 2013, primary education was reformed and the content and methodology of the core curriculum was updated. The curriculum aims to teach every child to respect national culture and traditional customs, develop talents and interests, be self-confident and exercise creative thinking, develop good skills for lifelong learning and live and work together. The revised curriculum is based on the fundamental principle to provide every child with opportunities to develop their unique characteristics and skills. The general skills of the core curriculum (e.g. differences and respect for diversity, learning together, caring for and helping each other) include elements of ESD.

#### *Secondary school*

Secondary education consists of a compulsory four years of lower secondary education (for 11–14-year-olds) and a non-compulsory three years of upper secondary education (for 15–17-year-olds).

#### Lower secondary education

As part of the ESD Project, the then Ministry of Education, Culture and Science developed a new core curriculum for lower secondary education and approved it in July 2015, for the academic year 2015–2016. EE and ESD are integrated into the new core

curriculum. For instance, the aim of education in natural science is to prepare a citizen who develops cognitive skills and continued learning, acts in an environmentally friendly manner and contributes to environmental preservation. Subjects such as physics contain issues related to energy use, energy efficiency and renewable energy sources, for students of grade VIII. Biology contains issues related to the impact of human action on the food chain. Chemistry includes the study of pollution, including chemical pollution of water and dust pollution of air, and pollution prevention methods. Geography covers issues related to demographic changes (e.g. migration, population age, unemployment, gender), climate change, water use and consumption, water and mineral reserves, environmental protection and environmental and social dimensions of sustainable development. Design technology includes learning to use traditional materials and the reuse of waste materials. Consistent implementation of the new curriculum supported by adequate teacher training is expected to contribute to shifting the mindsets of citizens towards life choices underpinning sustainable development.

The new curriculum is at the beginning of its implementation and the results of its impact are not yet available. The challenges to ensuring adequate implementation are the lack of teacher knowledge and expertise in ESD, the limitations of current schools infrastructure and the financial resources allocated to the education sector, for both its maintenance and further development.

#### Upper secondary education

The core curriculum for upper secondary education was developed with support of the ESD Project and approved by the Ministry of Education, Culture, Science and Sports in June 2016 for the academic year 2016–2017.

#### Capacities of public and private schools

In 2016, there were 778 schools, including 628 public schools. Private schools are mostly in Ulaanbaatar. The capacity of the public schools to put ESD into practice and develop a whole-institution approach<sup>9</sup> can be hindered by the limited availability of funding, leading to possibly inadequate human and financial resources.

According to the director of a public secondary school in Ulaanbaatar, the integration of EE and ESD into teaching commenced some 10 years ago and has intensified since 2012. The problems students have to solve moved from theoretical and abstract notions to practical life issues, e.g. in mathematics, instead of calculating the distance from A to B, students are asked to calculate the distance from one Mongolian settlement to another. Also, an integrated approach to teaching involving several subjects is increasingly used, e.g. students are asked to calculate the time required by trees to grow 10m and, simultaneously, the amount of oxygen produced. In addition, since 2013, extra-curricular activities include visits to industrial plants to learn the practical application of the acquired theoretical knowledge.

In that particular public school, the major challenges in applying these new approaches include the constraints posed by school facilities. The demand for school places is three times higher than the standing capacity (3,010 students for 1,080 places), resulting in oversized classes organized in three shifts. Also, the availability of training for teachers to adequately integrate EE and ESD is limited. The annual school budget is barely sufficient to cover teachers' salaries and operational costs for the building infrastructure and utilities. As a result, no resources remain to organize extensive extra-curricular activities or to organize additional teacher training in EE and ESD. In the annual budget of that public school of 1.7 billion tugriks (approximately US\$700,000) for 2016–2017, only a tiny fraction of about 2 million tugriks (approximately US\$816) is for teacher training. This contrasts with the private schools where budgetary capacities for organization of ESD and in-service teacher training are higher (box 5.4).

#### Schools with environmental specialization

The only high school with environmental specialization is the private Ecological Lyceum, established under the auspices of the National University of Mongolia (NUM) in 2001 and providing grades 10–12 of upper secondary education. The Lyceum has two curricula: the core curriculum for upper secondary education and the specialized curriculum (in six areas related to the environment), developed by NUM in close cooperation with a team of teachers from the Lyceum. The Lyceum uses manuals developed by the Ministry of Education, Culture, Science and Sports for its core curriculum,

approach, each institution decides on its own actions, addressing the three overlapping spheres of campus (management operations), curriculum and community (external relationships).

<sup>9</sup> A "whole-institution approach" means that all aspects of an institution's internal operations and external relationships are reviewed and revised in the light of sustainable development/ESD principles. Within such an

and those prepared by NUM for the specialized courses. It has an ecology club and a floral club, with some 20 students participating in each. The Lyceum organizes a one-day mandatory training course about nature for every new student. Such training has been done since 2011 in the form of ecotours organized in autumn by the Environment Education Centre. Ecotours are conducted in the natural environment (forest, park, field) and comprise 10 different clusters of activities related to the environment.

### *Vocational training*

Vocational training is accessible to graduates of lower secondary education. During the last 10 years, interest in vocational training nearly trebled reaching 19,500 graduates in 2016. In 2017, 91 technical vocational education centres were operating in Mongolia, including 38 funded by the state budget and 53 either semi-private or private.

The curriculum for vocational training is demand driven. Depending on the demand for, e.g. miners, electricians, road builders or construction workers, a specialized curriculum is developed by relevant universities and subject experts employed by companies that will benefit from the graduate workforce. The Vocational Education Policy

Implementation Department, which is a government implementing agency financed from the state budget, is also involved in the development of curricula and pedagogical methodology for the teachers.

The vocational training curriculum does not include separate subjects on the environment or sustainable development. At the same time, efforts are made to integrate environmental and development issues into various subjects, with a view to greening the respective sectors. For instance, the curriculum for the construction sector includes 36 hours' training on the insulation of buildings, and students learn to replace some materials with local organic materials, such as Mongolian sheep wool for external insulation.

Generally, a demand-driven and "open door policy" approach is used to develop the the vocational training curriculum. For example, the development of a subject on environmental management, including ISO 14000 on environmental management and ISO 9000 on quality management, would be considered if enough students expressed their interest in such a course.

Since 2016, Mongolia Sustainable Development Vision 2030 has been integrated into the curriculum of the technical vocational education centres.

#### **Box 5.4: Integration of EE and ESD in a private school: the example of Hobby School**

Established in 1994, Hobby School is a private school providing a bilingual English–Mongolian primary-to-high-school education. Since 2016, it follows the International Primary Curriculum and the International Middle Years Curriculum, by organizing teaching in an interconnected way across subjects under a general theme "to serve nature".

Activities are carried out both within the curriculum and extra-curricular. Such activities include, for the 3rd and 4th graders, planting and taking care of their own flower beds in the school courtyard; for the 5th graders, participating in a project to protect plants; middle-school students are engaged in various activities geared to learning about responsibility, tolerance and development. For instance, as part of learning how to "be responsible", 8th graders learn about the harm of smoking through an experiment with nicotine passing through a filter and water, colouring the water yellow/brown, emitting a bad smell and causing headaches. They also learn about how to take care of others, including elders. The 9th graders learn about "development", including assessing progress in their own development, identifying milestones, setting goals and considering the performance and actions necessary to achieve the goals. As part of the teaching about traditional knowledge, the senior grade students can engage in extra-curricular activities after class, such as classes on how to build a ger for 11th-grade boys or how to make their own traditional dress for 12th-grade girls.

Hobby School integrated environmental and sustainable-development-related issues across other subjects; for instance, during biology classes, students learn about environmental pollution and during mathematics, students calculate water consumption. Also, under the water theme, students are taught about water waste and the health impact of unclean water consumption. During life skills lessons, fifth graders learn about the water shortages in the Gobi Desert, how to clean the water when in the countryside and the impact on animals of polluted water from the mining sector.

In 2016–2017, Hobby School had an 800-student capacity and 796 students, and worked in one-shift classes. The overall school budget per year is 5.5 billion tugriks (US\$2,235,000). Specific funds of 4.6 million tugriks (US\$1,869) are allocated annually to promote EE and ESD in the school. The State supports the school budget with 243 million tugriks (approximately US\$99,000) annually. The in-service teacher training is financed from the school budget.

The key challenge in promoting EE and ESD is the lack of adequate expertise and in-depth teacher training on EE and ESD.

### *Higher education*

In 2016, there were 95 higher education institutions (universities and colleges), including 90 in Ulaanbaatar and others in Arhangay, Darhan, Gobi-Altay, Tov and Zavhan Aimags; 17 of them are public. In addition, four foreign universities have a branch in Mongolia. Generally, there are separate subjects and programmes on ecology and on environmental protection in universities. In addition, there are subjects or elective courses on environmental protection in other specialist programmes.

The universities have started the integration of green economy concepts into university business and economics curricula. In particular, PAGE has been working with several universities on integrating green economy concepts and approaches into higher education programmes and curricula. New university courses at undergraduate level on green economy and modelling as well as sustainable finance have been completed for a pilot run in the 2018–2019 academic year, involving the Mongolian University of Life Sciences, the National University of Mongolia, the University of Finance and Economics and the National University of Commerce and Business. Furthermore, Caritas (a Czech NGO) has worked with the Mongolian University of Science and Technology to develop the curricula for the course "Green buildings", which is now taught as an elective course at undergraduate level.

#### National University of Mongolia

Since its restructuring in 2013, the National University of Mongolia (NUM) has five schools. The School of Arts and Science constitutes 50 per cent of NUM; of some 20,000 students, 10,000 attend this School. The other schools include the Law School, Business School, School of Applied Science and Engineering and School of International Relations and Public Administration.

The Biology Department is located in the School of Arts and Science and has 400 students, as has the Department of Geography. The studies include courses related to the environment, such as on ecology, conservation and biodiversity; physical geography, earth and planetary studies; remote sensing, geographical information systems; molecular biology, genetics and biotechnology; and biomaterials and functional materials chemistry.

Another department related to environmental studies is the Department of Environmental Sciences and Chemical Engineering located in the School of Applied Science and Engineering. It has learning

programmes in environmental sciences, environmental assessment, meteorology, hydrology, soil science, applied chemistry, chemical engineering and technology, environmental protection technology, material science, nano science and engineering, nuclear engineering, biotechnology and bioengineering, and forestry.

Environmental studies, including ecology, nature conservation, and environmental use and assessment, are among disciplines included in the master's and doctoral programmes at NUM. NUM professors develop the manuals and materials for the courses themselves. In-service training for teachers is organized by the Faculty Development Centre. Sustainable development issues are not included in the in-service training of teachers.

Sustainable-development-related issues have begun to be integrated into the courses, but not in a comprehensive manner. The Institute for Sustainable Development was established under NUM a few years ago as a research centre.

#### Mongolian University of Life Sciences

The Mongolian University of Life Sciences (former Agricultural University) has 25 programmes/specializations, including two programmes related to the environment, i.e. on environment protection technology and on ecology. Every year, 370 of the 2,500 students take the environment-related programmes. In addition, environment-protection-related issues are integrated into other specialist programmes. The motto of the University is "Agriculture for Sustainable Development".

#### Mongolian National University of Education

The Mongolian National University of Education trains secondary school teachers. It offers both undergraduate and postgraduate courses. ESD is incorporated as 8 credits in the teacher training programme at master's level, and as 10 credits at the undergraduate level. The motto of the university is "Teacher leadership is the key to development".

#### National University of Commerce and Business

The National University of Commerce and Business (established in 2017 as a separate university by detaching from the National University of Mongolia) has recently established the Centre for Sustainable Production and Trade.



### *Training of teachers*

The in-service training of teachers by the Institute of Teachers Professional Development (ITPD) targets teachers of secondary school, preschool, lifelong education centres and vocational school, administrators such as school principals, and school staff, including dormitory teachers, school librarians and social workers, and preschool pedagogy specialists.

ITPD does not have specific subjects on the environment or sustainable development; rather, these issues are embedded in all subjects taught. Since its reestablishment in 2012 and until 2014, ITPD worked on developing programmes and plans for teacher training. In 2015, these programmes were reviewed in the light of the 2030 Agenda for Sustainable Development and the SDGs. In that regard, ITPD developed indicators to measure progress in its work.

Since 2014, ITPD has participated in the ESD Project. This has enabled it to conduct training for teachers and school staff to introduce the ESD concept. Participation in the Project also allowed ITPD to develop a training module and guidelines, and strengthening the capacity of its staff.

The ITPD's teacher development portal (<http://teacher.itpd.mn/>) includes a few modules of training on ESD. The modules cover, for example, how to integrate ESD into teaching chemistry and into the natural science course. ITPD shares on its website useful information and materials, for instance, the best classroom teaching practices at different levels or materials to support curriculum implementation.

Developing in-depth expertise and knowledge in issues related to sustainable development is among the challenges encountered by ITPD in its activities to incorporate sustainable development into its work and training programmes. Another constraint is that the low salary of teachers (500,000–700,000 tugriks (US\$203–US\$285) per month) does not motivate teachers towards self-study and proactive integration of issues related to sustainable development into their teaching.

#### Training of teachers with support of the ESD Project

With support of the ESD Project, nationwide training sessions were organized for more than 24,000 teachers on ESD principles and implementation of the core curriculum. In addition, training sessions were organized to develop the capacity of educational

institutions, as well as for the staff of the Ministry of Environment and Tourism and Ministry of Education, Culture, Science and Sports and their subordinated institutions.

Recent examples of such training include a series of workshops organized by the Ministry of Education, Culture, Science and Sports in March 2017 to raise awareness and develop the capacity of school staff. Three staff from each school – the school administrator/principal, the social worker and the teacher of natural science – underwent three days' training. In all, 850 staff were trained. As a follow-up to the workshops, action plans on the activities required in each aimag were developed. Another workshop was organized in May 2017 for staff of aimag education departments; in total, 260 persons were trained.

### **5.5 Informal and non-formal education on the environment and sustainable development**

#### *Activities of the Ministry of Environment and Tourism*

The Ministry of Environment and Tourism is engaged in providing non-formal education on environmental protection, sustainable development and green economy. Activities are implemented in cooperation with WWF, UNESCO, PAGE, ESD Project and Global Green Growth Institute (GGGI). They target policymakers of ministries and aimags, environmental sector professionals and private sector representatives. The Ministry of Environment and Tourism, in cooperation with the Ministry of Education, Culture, Science and Sports and other stakeholders (WWF, UNESCO, international and national NGOs), took the lead in developing a national programme on ESD, which is planned to be finalized in 2017. The programme would include training civil servants from other ministries and governmental agencies on the environment and sustainable development. Furthermore, at the initiative of the Ministry of Environment and Tourism with support from the ESD Project, training materials for journalists working in the ESD area have been prepared and some 300 journalists were trained on ESD.

From 2014 to 2016, 40.85 per cent of financing from the Environment and Climate Change Fund was directed towards EE (table 3.14).

#### *Programmes at the National Centre for Lifelong Education*

The impetus for development of lifelong learning and non-formal education was given by the 1997 National

Programme on Non-formal Education Development (1997 Government Resolution No. 116) and 2002 National Programme for Distance Education (2002 Government Resolution No. 14). The National Centre for Lifelong Education (formerly the National Centre for Non-formal and Distance Education) under the Ministry of Education, Culture, Science and Sports, with its 374 centres of lifelong education operating at the local level, coordinates the implementation of national programmes. It develops non-formal education training materials and provides methodological support. The programmes implemented by the National Centre include, among others, life skills, EE, ESD and health education. Creating a safe environment for children is integrated into the family education component of the lifelong and non-formal education programmes.

### *Eco-Schools*

Mongolian schools participate in the Eco-Schools international programme, which is based on the ISO 14001 standard. Eco-Schools provide a bridge between formal and non-formal education.

Starting from 2008, activities to establish and operate eco-schools were supported through the SDC's Coping with Desertification Project. Since 2015, they are supported through the SDC's ESD Project, jointly implemented with the Ministry of Education, Culture, Science and Sports and the Ministry of Environment

and Tourism. The Information and Training Centre for Nature and Environment (ITCNE) NGO is the national operator for the Eco-Schools international programme.

As at mid-2017, 252 schools were engaged in the Eco-Schools programme, i.e. 40 per cent of all public schools in Mongolia. Another 55 schools in 11 aimags and Ulaanbaatar were undergoing training, carried out by the ITCNE within the ESD Project, with a view to joining the Eco-Schools programme.

Participation in the Eco-Schools programme includes several components and steps, which typically could be implemented by a school within two years to achieve bronze and silver awards, and culminates with an application for the award of the Green Flag. Most of the participating schools in Mongolia have achieved a bronze award. Box 5.5 presents the example of a public school in Baiangol Soum of Selenge Aimag and describes its efforts and achievements in the framework of participation in the Eco-Schools programme.

### *Activities at the Environment Education Centre*

The Environment Education Centre, operating under the auspices of NUM, provides training in environmental protection for students from preschool, primary and secondary schools and higher education institutes, and the public at large.

**Photo 5.2: Pupils' work displayed in the public school in Bayangol Soum of Selenge Aimag**



**Box 5.5: Public school in Bayangol Soum of Selenge Aimag: successes from participation in Eco-Schools programme**

The public school in Bayangol Soum has been engaged in the Eco-Schools programme since 2013 and received a bronze award in 2017. The bronze award means that the school succeeded in accomplishing steps 1 (form an Eco Committee), 2 (carry out an environmental review) and 3 (make an action plan) of the Eco-Schools framework. Several more steps remain to be achieved, i.e., 4 (monitor and evaluate), 5 (link to the curriculum), 6 (inform and involve) and 7 (produce an Eco Code) to make the school eligible for the Green Flag.

Since 2012, the school has been improving the environment in and around the school area by planting trees (reaching 350 trees in 2017). Students cultivate flowers and seedlings in eight greenhouses, which are then planted outside. The school dormitory, hosting 140 children from nomadic herders' families, was renovated and eight solar panels were installed. The school is involving parents and the local authorities alongside the pupils in various activities, including in producing handicrafts, organizing competitions, developing the school environment, participating in rehabilitation of mining sites, etc. The school also works on integrating relevant SDGs into the teachers' work plans.

In all, 72 teachers, including 32 working full time, undertook some training on ESD, with support from the soum authorities. Fifty of the school's 910 pupils are members of the school's Eco Committee.

The Centre is visited by some 3,000 children per year, 60 per cent of whom are from primary and lower secondary schools, 30 per cent from kindergartens and 10 per cent from higher education institutes or are members of the public. The kindergarten children visit the museum with animals, the greenhouse and the garden. The first and second graders have the same programme. For third grade children, additional activities are added to the core ones. The Centre has 40 programmes/activities from which it chooses additional activities to add to the core ones, depending on the interest of each visiting group. The Centre's staff develops the programmes/activities and prepares relevant materials. Since 2012, some activities have been developed with support from national and international donors. Activities also include other training on environmental issues developed and organized by the Centre. For example, in 2012, under the SDC-supported project on artisanal mining, the Centre, together with NUM staff, organized training for staff of the local administrations and representatives of the mining companies. Notwithstanding its current focus on environmental issues, the Centre plans to expand its activities to raise awareness on and promote sustainable development.

## 5.6 Legal, policy and institutional framework

### *Legal framework*

#### Access to information and public participation

Access to information is regulated by the 2011 Law on Information Transparency and Right to Information, the 1995 Law on Privacy of Organizations, the 2008 amendment to the 1995 Law on Environmental Protection, the 2015 Law on General Administrative Procedures, 1995 Law on Resolving Complaints made

by Citizens against Civil Servants and State Bodies and the 2002 Law on Civil Procedures.

Public participation in decision-making is regulated by the 2015 Law on General Administrative Procedures, 2015 Law on Legislation, 2012 Law on Environmental Impact Assessment and 1995 Law on Environmental Protection. Several laws contain explicit provisions entrusting NGOs to assist with relevant environmental protection activities.

Access to justice is regulated by the 2002 Law on Civil Procedures, 2015 Law on General Administrative Procedures, 2016 Law on Decisions on Administrative Cases in Court, 2015 Criminal Code and other acts.

However, there are challenges with implementation and enforcement of the legislation by governmental and other institutions. Specific mechanisms were developed for some aspects of public participation (e.g. public participation in EIA and SEA), but are not available for others (e.g. public participation in the preparation of the national position for international negotiations on environmental matters).

#### Environmental education and education for sustainable development

Several laws regulate the education sector, the majority of which were developed in 2002 and amended up until the present. These include the 2002 Law on Education, 2008 Law on Preschool Education, 2002 Law on Primary and Secondary Education, 2009 Law on Vocational Education and Training and 2002 Law on Higher Education. The 1995 Law on Environmental Protection includes provisions on EE, including the responsibility of the Government to finance EE activities.

The legal framework for ESD builds on the Order of the Minister of Education, Culture and Science No. A/458 of 13 November 2015 approving the guidelines "Key areas and requirements of incorporating and implementing the concept of ESD in the training and activities of general secondary schools". This Order declares ESD to be the overarching principle in the education sector and that all institutions engaged in formal education should apply and adhere to ESD. Other relevant acts include orders of the Minister of Education, Culture and Science approving the core curriculum for lower secondary education (Order No. A/302 of 10 July 2015) and the core curriculum for upper secondary education (Order No. A/275 of June 2016).

### *Policy framework*

#### Access to information and public participation

The Mongolia Sustainable Development Vision 2030 includes a sustainable development objective: 2.4 "Governance for sustainable development". This document, as well as many other national strategic documents, includes references to public participation, transparency, accountability and community-based natural resource management. However, the strategic documents commonly lack any indicators, which would enable the measurement of progress in this area.

#### Environmental education and education for sustainable development

Integration of EE commenced with the adoption by the Government of the National Programme for Public Ecological Education (1997 Government Resolution No. 255). Since then, a number of policies were adopted by the Government, such as the National Programme on Non-formal Education Development, National Programme for Distance Education, and State Education Policy for the period 2014–2024 (2015 Resolution of the State Great Khural No. 12).

The 2016 Mongolia Sustainable Development Vision 2030 includes several objectives and related actions to improve the education system. The 2014 Green Development Policy encourages education, science and technology to serve as a catalyst for green development. The 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 includes one specific measure under its strategic objective 5: To ingrain a resource-efficient and effective consumption culture, environmentally friendly lifestyle, traditional customs of nature/environmental conservation and patriotism through ESD. Seven activities are foreseen to implement this measure, mostly under the leadership

of the Ministry of Environment and Tourism in cooperation with the Ministry of Education, Culture, Science and Sports. The sole funding sources foreseen for the six activities of seven planned are international organizations.

### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis SDG Targets 4.7 and 12.8 is described in box 5.6.

### *Institutional framework on access to information and public participation*

#### Ministry of Environment and Tourism

Ensuring access to environmental information is the responsibility of the Ministry of Environment and Tourism. The content of the Ministry's website is prepared by the Ministry's Media Office, which consists of four persons, including the office head, two journalists and a photographer, and the technical part is developed and maintained by the IT unit, which consists of two persons. In addition, the Media Office prepares information related to the "hot" environmental topics (e.g. illegal activities in the environmental sector or in economic sectors that have an impact on the environment) by providing information to the main national and local newsletters that write and publish articles in the main newspapers. The Media Office also works to validate the data and prepare public broadcasts.

The Ministry of Environment and Tourism has no unit specifically dedicated to handling access to information and public participation in decision-making. These issues are distributed to various departments within the Ministry. Public requests for information pertaining to sectoral ministries are transmitted by the Ministry of Environment and Tourism to the relevant ministries.

#### Environmental Information Centre

The EIC manages a number of environmental databases and therefore is potentially an important mechanism for providing information to the public. It was established following the 2008 amendment to the 1995 Law on Environmental Protection. According to that amendment, the Ministry of Environment and Tourism was obliged to establish the EIC to serve as the governmental agency for environmental information. Its responsibilities include ensuring proper conditions for users to obtain information from the databases.



**Box 5.6: Targets 4.7 and 12.8  
of the 2030 Agenda for Sustainable Development**



**Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**

**Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development**

**Goal 12: Ensure sustainable consumption and production patterns**

**Target 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature**

Targets 4.7 and 12.8 are measured by similar global indicators (Indicators 4.7.1 and 12.8.1), assessing the extent to which (i) global citizenship education and (ii) ESD, including gender equality, human rights and climate change education, are mainstreamed at all levels in: (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.

With regard to mainstreaming global citizenship education, in 2016, UNESCO undertook a comparative analysis on global citizenship concepts in curriculum guidelines of 10 countries, including Mongolia.<sup>10</sup> According to the analysis, global citizenship and related concepts do not figure in the Mongolian civic education curriculum, which is largely divided into two domains: Mongolian traditions and cultural heritage, and contemporary civic education. According to this report, fostering active participation through civic and citizenship education remains strong at the community, local and national levels.

In respect of ESD, Mongolia has an enabling framework to achieve Targets 4.7 and 12.8 by 2030 in terms of mainstreaming ESD into national education policies (item (a) of the global indicator) and curricula (item (b)), provided that the present commitment by the Government continues, actions are taken and adequate resources are allocated for ESD beyond the winding up of the ESD Project. At the same time, no evidence was provided on mainstreaming ESD into teacher education (item (c)) and student assessment (item (d)). In that regard, based on experience acquired from implementing the ESD Project, the Ministry of Education, Culture, Science and Sports, in collaboration with the Ministry of Environment and Tourism, should undertake specific efforts to mainstream ESD into teacher education and student assessment. Also, efficient mechanisms should be developed to secure resources for ESD, including by involving the private sector into the medium- and long-term financing of ESD, in addition to governmental financing and assistance from international organizations.

At present, the Information and Research Institute of Meteorology, Hydrology and Environment, operating under NAMEM, hosts the EIC. In 2016, the EIC was downgraded to an Environmental Database Division within the Institute; however, most of the users still refer to it as the Environmental Information Centre. Strictly speaking, the existing arrangements do not correspond to the amended Law on Environmental Protection since the EIC does not function under the direct auspices of the Ministry.

Fresh Water Resources and Nature Conservation Centre

The Fresh Water Resources and Nature Conservation Centre under the Ministry of Environment and Tourism was established in 2011 to carry out research on freshwater and environmental protection and deliver EE to the public. The Centre has 25 staff.

Sectoral ministries

Detailed information on how the sectoral ministries are handling requests from the public is not available, except for the Ministry of Mining and Heavy Industry, which, since 2016, posts on its website general information about responding to requests and complaints from the public.

For 279 requests and complains received in 2016, the rate of response for the Ministry was 91 per cent (to 65 requests and complains) and for its Mineral Resources and Petroleum Authority – 94 per cent (to 214 requests and complains). The number of complaints is much higher than that of requests.

Other actors

The Environmental Branch of the Mongolian Lawyers Association, established in 2016, consists of 20 members working on a voluntary basis. The Branch

<sup>10</sup> IBE-UNESCO and APCEIU, *Global Citizenship Concepts in Curriculum Guidelines of 10 Countries: Comparative Analysis* (2016), available from <http://unesdoc.unesco.org/images/0024/002477/247788E.pdf>

promotes the use of environmental legislation in courts.

The environmental journalism club, a group of journalists who specialize, or are interested, in environmental and mining reporting, was established in 2009 under the Press Institute with the aim to improve the quality of environmental reporting.

*Institutional framework on environmental education and education for sustainable development*

The Ministry of Education, Culture, Science and Sports is the key governmental body responsible for the country's educational system. The Ministry deals with almost all publicly financed forms of education, ranging from preschool institutions to adult education. Its mandate includes approval and publishing of textbooks and curricula. The Ministry also coordinates and provides in-service training for all staff engaged in the public education sector. Regarding the implementation of EE and ESD, responsibilities are given to the relevant staff members in charge of different levels of education, i.e. no specific staff in the Ministry are assigned solely to deal with EE and/or ESD.

The National Centre for Lifelong Education under the Ministry of Education, Culture, Science and Sports, with branches in each aimag and soum, oversees the promotion of lifelong learning and non-formal education.

The Education Evaluation Centre under the Ministry of Education, Culture, Science and Sports is responsible for evaluating the quality of education based on the methodology and indicators that the Centre develops in accordance with internationally agreed standards.

The Mongolian Institute of Education Research, also under the Ministry of Education, Culture, Science and Sports, is in charge of developing curricula, manuals and training materials for approval by the Ministry.

The Institute of Teachers Professional Development (ITPD) under the Ministry of Education, Culture, Science and Sports supports continuous development of preschool, primary and secondary school teachers, administrators and staff members. Its 70 staff members include 40 working in the five training-related departments and 30 working for the administration. Since 2016, ITPD has been a member of UNESCO's Resource Distribution and Training Centres (RDTCs) and Network on Education Quality Monitoring in the Asia-Pacific (NEQMAP).

For more than 50 years, vocational training was managed by the Department on Professional Education of the Ministry of Labour. In November 2016, the Vocational Education Policy Implementation Department which is a government implementing agency financed from the state budget, was established to oversee the vocational training taking place in 91 professional schools. The Vocational Education Policy Implementation Department is under the Ministry of Labour; it receives guidance from the Ministry and works closely with the Ministry's relevant departments. It has six staff, who work on methodology for schools, teacher development skills, maintaining statistics, school environments and promoting social partnerships. The Vocational Education Policy Implementation Department is also involved in the development of curriculum and methodologies for the teachers engaged in vocational training.

In the Ministry of Environment and Tourism, the Green Development Policy and Planning Department deals with ESD issues.

The Environment Education Centre, established in 1957 by the Ministry of Education, Culture, Science and Sports, has operated under the auspices of NUM since 1998. It is a unique centre in Mongolia, conducting organized activities to raise the awareness of preschool and secondary school students about the natural environment and environmental protection. It has five staff. The budget of the Centre is covered 50 per cent by NUM and 50 per cent from the staff's own fundraising activities (i.e. providing training for the public, organizing ecotours, developing projects, applying for grants, etc.).

In each aimag, the aimag education department oversees the implementation of government policies relating to both formal and non-formal education. These departments establish, administer and manage (as well as fund) kindergartens, primary and secondary schools.

For example, in Selenge Aimag's Department of Education and Culture, 10 staff members are in charge of 32 schools and 42 public kindergartens serving some 27,000 pupils. There is no special staff in charge solely of EE and/or ESD. Staff members overseeing chemistry and biology, and, to a lesser degree, physics and geography, are responsible for EE. No special budget line in the aimag budget is allocated to EE and ESD implementation; however, the Government of Selenge Aimag is reserving funds to be able to support related activities. The Department also supports schools to join the Eco-Schools programme. The biggest challenge encountered by the Department is

developing the expertise (of both the Department staff and teachers and other school staff) in the content and methodology of EE and ESD. The provision of adequate financial resources to support coherent implementation of EE and ESD is of paramount importance.

### 5.7 Participation in international agreements and processes

*Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)*

In 2011, Mongolia expressed its formal interest in acceding to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). In April 2012, following an invitation from the office of the President of Mongolia, ECE undertook a mission to Ulaanbaatar that was led by the Chair of the Meeting of the Parties to the Aarhus Convention, with the participation of a number of parties to the Convention. There was follow-up correspondence between the Convention Secretariat and the Government of Mongolia. As of mid-2017, according to the Ministry of Environment and Tourism, accession is not being considered by the Government since Mongolia does not have appropriate conditions to accede to the Convention.

*United Nations Human Rights Council*

The United Nations Special Rapporteur on human rights and the environment undertook a mission to Mongolia in September 2017, to prepare a public report to the Human Rights Council that describes both good practices and some challenges in the application of human rights to environmental protection in the country. The preliminary results include an overview of problems, highlighting the need to strengthen the legislative framework and to implement it in practice as well as monitor its enforcement and compliance. The preliminary results also include recommendations for improvement, including:

- The Government to amend the relevant laws to give local communities more time to conduct consultations on proposals for mines;
- In amending the Law on Mining, the Government to ensure full and meaningful participation by civil society to ensure that the revised law takes into account their perspectives and concerns;
- The Government to establish an Environmental Ombudsperson, whose mandate would be to serve

as a focal point for environmental information and complaints;

- Mongolia to join the Aarhus Convention;
- Mongolia to enact the law on human rights defenders that was drafted by the Mongolian National Human Rights Commission.

*Education*

Mongolia participated in the United Nations Decade of Education for Sustainable Development (2005–2014) and takes part in the follow-up activities, such as the Global Action Programme on Education for Sustainable Development .

Mongolia participates in the Partnership for Action on Green Economy (PAGE) (chapters 1, 3, 6). Among others, activities under the framework of PAGE include the greening of school and kindergarten buildings. For example, PAGE supported the Government to develop the green school building design for the second building of school No. 122 in Ulaanbaatar, to showcase how to achieve the building efficiency standards.

### 5.8 Assessment, conclusions and recommendations

*Assessment*

Access to environmental information and public participation in environmental matters have evolved considerably during the past decade. The Ministry of Environment and Tourism rightfully stands out as a leader in this respect, despite the existing constraints on capacity and resources and the remaining challenges. The sectoral ministries still have to develop specific procedures to provide access to environmental information and ensure public participation in decision-making on environmental matters. Raising the effectiveness of access to environmental information and public participation through revisions to existing legislation on the basis on accumulated experience is the key task for the years to come. Another key challenge to be addressed is the inadequate capacity of all actors, especially governmental authorities at the local level, to ensure implementation and enforcement of existing legislation.

Mongolia has initiated a good process of integrating ESD into the curricula of general secondary education. Consistent and adequate implementation of the new curricula in all schools across the country is now important. Clear successes include such initiatives as eco-schools and the work of the Environment Education Centre, given their effectiveness and impact

on advancing EE and ESD. The biggest challenge is the provision of necessary financial resources from the state budget after the winding up of the ESD Project in order to further develop and expand ESD in the country, ensure the training of teachers and build capacity on ESD of relevant governmental officials. The Government's continuous commitment to and provision of adequate support to integrate ESD into formal and non-formal education are prerequisites to the successful development of ESD and the achievement of SDG Targets 4.7 and 12.8.

### *Conclusions and recommendations*

#### Access to environmental information

Overall, the legislative framework regulating access to environmental information is in place and evolving; nevertheless, adequate implementation by both the Government and the public remains a challenge. The Government lacks resources to set up an efficient and effective structure to handle public requests within the deadlines. The current practice and procedures in governmental institutions other than the Ministry of Environment and Tourism in providing environmental information to the public are rather fragmented. The public lacks knowledge both of its rights to information and the procedures provided in the legislation to enable people to exercise those rights and of existing mechanisms established by the authorities that hold environmental information. This is particularly evident in light of the many changes to the legislation and procedures undertaken since 2012.

The Government has made some effort to encourage the disclosure and active dissemination of environmental information by business entities, in particular in the framework of the Extractive Industries Transparency Initiative (EITI). However, these efforts are at their very inception and are not sufficiently visible in sectors other than mining.

#### Recommendation 5.1:

*The Government should:*

- (a) *Strengthen implementation and enforcement of the 2011 Law on Information Transparency and Right to Information;*
- (b) *Encourage active dissemination and provision of environmental information by sectoral ministries;*
- (c) *Promote awareness-raising, knowledge and capacity-development for the public, with the focus on the legally guaranteed rights and procedures to access environmental information, including existing mechanisms to facilitate such access.*

#### Environmental Information Centre

The EIC, which manages a number of environmental databases, is potentially an important mechanism for providing information to the public. At present, the Information and Research Institute of Meteorology, Hydrology and Environment, operating under NAMEM, hosts the Centre. In 2016, the EIC was downgraded to an Environmental Database Division within the Institute. Strictly speaking, the existing arrangements do not correspond with the amended 1995 Law on Environmental Protection, since the EIC does not function under the auspices of the Ministry.

#### Recommendation 5.2:

*The Ministry of Environment and Tourism should:*

- (a) *Take the lead in overseeing the functions and work of the Environmental Information Centre, including raising its status and structure and placing it in premises easily accessible to the public, with a view to extending it to become a comprehensive "one-window" online portal on environmental information;*
- (b) *Ensure the quality of data available at the Environmental Information Centre through the establishment of quality assurance and quality control systems.*

*See Recommendation 2.6.*

#### Public participation

Mongolia is progressing towards developing the legal framework for public participation in environmental decision-making and implementing it in practice. Achievements to date include establishing formal procedures for public participation in EIA, SEA and, more recently, law-making procedures, through the adoption of the 2015 Law on Legislation.

However, numerous challenges remain to ensure effective public participation. These include the insufficient time available for public consultations on planned projects (30 working days) and for public comments on the drafts of laws and secondary legislation (15 days), which do not take into account the specificity of vast territories and the way of life of nomadic communities in the country. Another important challenge is that local authorities (at bakh level) and local NGOs often lack the capacity and knowledge of how to proactively engage the public in consultations. Company representatives in charge of public relations commonly lack the necessary knowledge and skills to ensure an effective consultation process. Mobile phones and local TV



channels are insufficiently used as a mechanism to inform the public about public consultations.

To involve the public in preparing laws and policies, the Ministry of Environment and Tourism works closely with the Mongolian Environmental Citizens Council by involving its representatives in the working groups that are established for developing laws, regulations and policies. However, not all civil society organizations are part of the Mongolian Environmental Citizens Council. The Ministry does not provide information on its website about such working groups, their meetings and the outcomes of their work.

NGO representatives are rarely included in the national delegations to international environmental forums and meetings and very seldom are they involved in the preparation of the Mongolian position for these meetings.

Recommendation 5.3:

*The Ministry of Environment and Tourism should ensure effective public participation by:*

- (a) *Initiating the revision of legislation to extend deadlines for public consultations on planned projects and for public comments on draft legislation;*
- (b) *Raising the capacity of local authorities and business entities to enable them to proactively engage the public in consultations on planned projects;*
- (c) *Encouraging stronger use of mobile phones and other electronic information tools to provide public access to environmental information and enhance public participation;*
- (d) *Encouraging NGO participation in preparing laws and policies among organizations outside the Mongolian Environmental Citizens Council, giving them the opportunity to apply to be directly included in the working groups established for developing laws and regulations;*
- (e) *Encouraging NGOs to develop their capacity and accountability;*
- (f) *Encouraging participation of NGO representatives in international meetings related to the environment.*

Pressure on environmental activists

Cases of harassment and pressure against environmental activists for their environmental activities still occur. It is not clear what actions are

being taken by the Government to prevent such cases from occurring and to ensure proper investigation to avoid suspicion of covering up. In addition to harassment of environmental activists by business companies, there are cases of pressure having been put on environmental activists by the Government.

Recommendation 5.4:

*The Government should take measures to prevent pressure being put on environmental activists for their environmental activities.*

Access to courts

Access to the courts for members of the public and NGOs is limited by the resources, skills and knowledge available to them. There are no courts specializing in environmental cases. Judges do not receive training on environmental matters.

Recommendation 5.5:

*The Government should:*

- (a) *Enforce the provision on exempting public interest claimants from paying the state stamp duty, in accordance with the 2016 Law on Decisions on Administrative Cases in Court;*
- (b) *Ensure regular training of judges on environmental matters.*

Aarhus Convention

In 2011, Mongolia expressed its formal interest in acceding to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). As of mid-2017, according to the Ministry of Environment and Tourism, accession is not being considered by the Government. However, the solid framework offered by the Convention could assist the country in its efforts to establish transparent and participatory decision-making processes, thereby helping to build a stable and secure society, which, in the long term, could become economically prosperous and environmentally and socially sustainable. Furthermore, it could help Mongolia to further enhance democratic institutions and improve environmental decision-making by consolidating mutual trust and respect between the people and the Government. Moreover, through applying the Convention's principles, Mongolia would send a strong signal to other States, including its trade and development partners, as well as foreign investors and international institutions, of its commitment to effective governance and democracy.

Recommendation 5.6:

*The Government should:*

- (a) Seek advisory assistance and capacity-building support from the Secretariat of the Aarhus Convention with a view to acceding to the Convention;*
- (b) Consider acceding to the Aarhus Convention when the necessary implementation capacities are in place.*



***PART II***  
***DOMESTIC–INTERNATIONAL INTERFACE***



## Chapter 6

# IMPLEMENTATION OF INTERNATIONAL AGREEMENTS AND COMMITMENTS

### 6.1 General priorities for international cooperation related to the environment, sustainable development and green development

International, regional and bilateral cooperation is at the heart of environmental policy in Mongolia. The country follows closely and with commitment the international community's progress on sustainable development, the environment and green development.

Mongolia has ratified nearly all relevant global environmental agreements and has registered progress towards almost all of the MDGs (chapter 1). The Mongolian Action Programme for the 21st Century (MAP 21), developed between 1994 and 1998, was the country's first comprehensive document aligned with the principle of sustainable development.

With the framework strategy Mongolia Sustainable Development Vision 2030 (SDV 2030), in 2016, Mongolia once again demonstrated that the international agenda for sustainable development is at the epicentre of its political, legislative and programmatic action and strongly signalled its intention to focus its development efforts on achieving the SDGs, making the country one of the global early adopters of the SDGs. SDV 2030 outlines important priorities to achieve sustainable development over the period 2016–2030 and sets out an ambitious set of goals centred on human development and inclusive growth, including the SDGs (chapter 1). Actively participating in international cooperation aimed at achieving the SDGs is one of the SDV 2030 objectives and it is an overall goal that the country will pursue in all its cooperation activities.

Mongolia is in perfect symbiosis of cooperation with foreign countries and institutions. SDV 2030 outlines the country's priorities and objectives, and these are also the roadmap of specific priorities that the country will pursue in the framework of its international, regional and bilateral actions.

In 2014, the Green Development Policy was adopted, which aims to advance Mongolia's national development in an environmentally sustainable manner, building the conditions for future generations

to gain and benefit from in the long term, and to ensure environmental sustainability through the creation of growth based on green development concepts and through citizens' participation and inclusion. SDV 2030 and the Green Development Policy are mutually supportive. Preserving ecological balance and being placed among the first 30 countries on the Global Green Economy Index is one of the main goals of SDV 2030.

Mongolia has in place a structured and well-defined development policy planning system (chapter 1), which should provide a good basis for increasing the efficiency of available financial resources, from both external sources of assistance and the national budget. SDV 2030 is the core strategic document for all the downstream planning processes. The 2015 Law on Development Policy Planning includes sound principles with regard to policy planning and budgeting, going as far as establishing that national programmes shall be included in the state budget and the Public Investment Programme. To date, this close link between Mongolia's development goals in the areas of the environment, sustainable development and green economy, and the state budget, has not been visible (chapter 3), which means that the majority of projects implemented and actions developed continue to be financed with support from the donor community.

Mongolia has been supported by an increasing number of bilateral and multilateral donors, showing the country's capacity and commitment to establish diverse strategic partnerships, in various configurations, to pursue its objectives and the ability of the Ministry of Environment and Tourism to enhance coordination with the donor community.

### 6.2 Global and regional agreements

#### *Participation, reporting and follow-up*

Mongolia has been party to the majority of MEAs since the 1990s and has rapidly ratified the most recent MEAs, such as the Minamata Convention on Mercury.

The country ensures its participation in all relevant meetings of MEAs' decision-making bodies, with at

least one representative and, on several occasions, more than one. In meetings of a more technical nature, the country frequently includes in its delegations experts with a scientific profile. National NGO representatives are rarely included in the Mongolian delegations and very seldom are they involved in the preparation of the Mongolian position for international meetings.

Mongolia has complied with its international reporting obligations, with the exception of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention). In the case of CITES, the biennial reports were only submitted for 2003–2004 and 2015–2016, while annual reports for the Basel Convention were submitted five times, in 2001, 2005, 2014, 2015 and 2016.

Although Mongolia is very active on the international stage and implementation of international agreements is at the heart of its national environmental policy, in following up on these agreements and engaging in all the activities and projects developed within their scope, Mongolia faces a challenge in the high turnover of focal points. Evidence of this turnover is the almost general divergence between the focal points notified to the secretariats of the international agreements and the focal points in the country who are currently responsible for the different agreements. The high turnover of those responsible for the agreements also presents some challenges in terms of preventing the loss of information related to the whole history of negotiations and activities carried out. These challenges become particularly acute when the systematic and detailed follow-up of an agreement is the responsibility of just one person, which is the case for CITES and the Basel Convention.

The Ministry of Environment and Tourism, through its website, provides information to the public on the status of Mongolia's participation in global agreements and the implementation of those agreements, including some of the reports submitted.

*Conservation and sustainable use of biodiversity and nature*

Convention on Wetlands of International Importance especially as Waterfowl Habitat

Mongolia has been a party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) since 1998.

Although the country is very rich in wetland habitats, with extremely diverse wetland habitats, ranging from cold, deep ultra-oligotrophic lakes to temporary saline lakes and extensive flood plains included in major river beds, Mongolia only began paying attention to wetlands in the late 1980s. This is because, until then, the country's wetland resources were subject to low levels of exploitation. In the late 1980s, a significant change in the water levels of several water bodies started to become evident, especially in Boon Tsagaan Nuur, Orog Nuur, Taatsyn Tsagaan Nuur, Adgiin Tsagaan Nuur and Ulaan Nuur in the Valley of Lakes, prompting action to reverse the emerging loss and depletion of wetlands.

As it became clear that, with the rapid economic and demographic development of the country, the wetland resources would not remain undisturbed, scientific and technical work on wetlands began. Comprehensive studies were undertaken, such as hydrological assessments and analysis on groundwater quality, biodiversity, flood water run-off and the attendant changes in 95 rivers and 14 lakes. Monitoring on wetland morphology, hydrology, vegetation, fauna and water quality was carried out in 122 rivers. These studies and research provided a good basis on which to classify the country's wetlands as rivers, lakes, freshwater marshlands and saline marshlands and to identify the sites to be designated as Wetlands of International Importance (Ramsar sites).

In 1997, while the country was still in the process of acceding to the Ramsar Convention, a first site, Mongol Daguur, was designated a Ramsar site. The following year, three additional sites were designated as Ramsar sites: Lake Ogi, Lake Terkhiin Tsagaan and the Valley of the Lakes.

The lake and the wetlands of Mongol Daguur are a strictly protected area and therefore benefit from the highest status of protection conferred by the 1994 Law on Special Protected Areas. Mongol Daguur is also the Mongolian part of the Dauria International Protected Area (DIPA), which was subject to a trilateral cooperation agreement among Mongolia, the People's Republic of China and the Russian Federation, signed in 1994, to protect the Daurian ecosystem. The creation of this trilateral protected area, consisting of functionally connected wetland and steppe habitats, was of special importance for biodiversity conservation in Dauria, particularly for the protection of migrant species of birds and mammals and for the monitoring of biodiversity and ecosystems.

Mongolia does not have legislation to protect wetlands per se. The legal framework to protect wetlands is composed of provisions contained in several laws,

such as the 1995 Law on Environmental Protection, 1994 Law on Special Protected Areas (chapter 11), 1997 Law on Buffer Zones of Special Protected Areas (chapter 11), 2012 Law on Fauna (chapter 11), 2012 Law on Hunting, 2012 Law on Forests (chapter 13) and 2012 Law on Water (chapter 1). Additionally, to protect wetland and water-related bird species, some species have been included in the 1997 edition of the Red Book and some species, especially of wildfowl, such as *Pelecanus crispus*, *Cygnus columbi anus bewickii*, *C. cygnus*, *Egretta alba*, *Platalea leucorodia*, *Lutra lutra* and *Castor fiber*, benefit from some protection provided under the hunting legislation. Currently, the Ministry of Environment and Tourism is in the initial stage of preparation of a national wetland law.

To ensure efficient implementation of the Convention, a National Committee was established in 1998, with some adjustments – especially with regard to its composition – made in 2001 and 2010. Currently, the National Committee has assumed the form of a Steering Committee and is headed by the President of the Bird Research Association and includes several representatives from the Ministry of Environment and Tourism, academia (especially water and peat lake experts and biologists) and the 21 water basin administrations. The Committee meets once a year and has an important advisory role with regard to the implementation of the Convention, and several of its members participate in international meetings on Ramsar-related issues.

In 1999, two further Ramsar sites were designated – Lake Airag and Lake Khar-Us. In 2004, Mongolia completed the list, as it stands currently, with the designation of the following sites: Lake Achit and its surrounding wetlands, Lake Buir and its surrounding wetlands, Lake Ganga and its surrounding wetlands, Lake Uvs and its surrounding wetlands, and lakes in the Khukh-Khuiten River valley. The 11 Ramsar sites have a surface area of 1,439,530 ha (table 11.5) and are all included in the list of Important Bird Areas (IBAs), which comprises 70 areas in Mongolia covering around 5 per cent of its territory.

The level of protection afforded to the different Ramsar sites differs greatly when analysed in the light of the status given to each in terms of protection under the Law on Special Protected Areas. The Law foresees two major categories of special protected areas: state and local. It further establishes four subcategories of state special protected areas: strictly protected areas, national parks, nature reserves and natural monuments (chapter 11). Table 11.5 demonstrates which Ramsar sites are fully or partially protected, by the status of

protection enshrined in the Law on Special Protected Areas.

All the Ramsar sites are fully or partially included in the country's network of protected areas. The fact that some areas of these sites are not under any form of formal protected area designation has to be framed within the context of Mongolia's special characteristics, including vast areas of desert, semi-desert and boreal forest habitats, some of which are not under any relevant threat. However, Lake Ganga, Lake Buir, Lake Achit and Lake Terkhiin Tsagaan do not yet have management plans. The Ministry of Environment and Tourism aims to develop these management plans by the end of 2017. Up-to-date and comprehensive information on the status of these sites and on the effectiveness of the management activities implemented is lacking.

Since the early 1990s, the country has advanced considerably in wetland classification, designation of Ramsar sites, management and public awareness activities. Some protected areas were expanded to cover the areas within Ramsar sites that did not have a protection status. This is the case with Lakes Khukh and Orog in the Valley of the Lakes, which were included in the Ikh Bogd National Park.

Several activities on migratory bird research and monitoring were implemented, with the support of international organizations. International cooperation on migratory bird research and monitoring is expanding significantly. The International Crane Foundation, United States Geological Survey and United States Forest Service supported transboundary activities for conservation and monitoring of migratory bird species such as the white-naped crane and swan goose, and wetland ecosystem monitoring.

The main priorities in the context of implementation of the Ramsar Convention are conducting status assessments of Ramsar sites and issuing recommendations for their future conservation and management, designating Lake Khuvsgul (which is considered the most pristine water resource in Mongolia) as a Ramsar site by 2018, designating Khurkh Khuiten Valley as an LPA and establishing a model community-based natural resource management regime, improving Ramsar sites' monitoring activities and developing a mechanism to monitor the sites, maintaining a Ramsar national database and making it available to the public by 2018, improving international coordination through migratory bird research and regional wetland and sustainable water usage training, and improving funding mechanisms for Ramsar sites located outside the protected areas network.



### Convention on International Trade in Endangered Species of Wild Fauna and Flora

Mongolia acceded to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1996. Mongolia has 11 species of birds and six species of mammals listed in Appendix I and 52 species of birds, eight species of mammals, eight species of plants, two species of fish, one species of amphibians and one species of insects listed in Appendix II.

The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof, the 2012 Law on Fauna and the 1995 Law on Natural Flora establish the main legal framework for CITES implementation. The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof regulates relations associated with the implementation of CITES, and the granting of licences for the international sale of animals and plants listed in the Appendices of the Convention or derivatives thereof to citizens and economic entities. Of the 67 animal species protected and listed as rare or endangered by Mongolian legislation, 26 are listed in CITES Appendix I or II. Of the 133 plant species protected by Mongolian legislation, eight are listed in Appendix II.

The Environment and Natural Resources Management Department in the Ministry of Environment and Tourism is the Managing Authority, and the Institute of Biology of the Mongolian Academy of Sciences is designated as the Scientific Authority. The Managing Authority is the entity to which the request for permits to export or import plants or animals listed in the Appendices of the Convention or derivatives thereof, or for certificates to re-export or introduce from the sea should be directed, and is responsible for deciding on the issuance of such permits and certificates. Between 1996 and 2013, the Managing Authority issued approximately 800 export and re-export permits, allowing 85 species of animals and 15,000 plant products to be exported to 146 countries.

To support the coordination of CITES-related implementation activities, the Mongolian Commission for the Conservation of Endangered Species was created and rebranded to become the National Committee on Conservation of Fauna and Flora in 2009, with a larger scope of action.

Annual reports on CITES trade have been submitted regularly. However, the majority of biennial implementation reports on legislative, regulatory and administrative measures taken to enforce the Convention were not submitted, with the exception of

2002–2003 and 2015–2016. Starting from 31 October 2017, a new annual report on illegal trade will also have to be presented, covering the previous year.

Although the Convention does not impose the setting of quotas for any species that can be traded internationally, Mongolia established quotas for some species as a means to ensure better management of their trade. This was the case in 2001 and 2002 for the grey wolf, Pallas cat and argali sheep, and in 2010 and 2011 for the Saker falcon.

In 2005, in the context of the Review of Significant Trade in Saker Falcon and in compliance with Resolution Conf. 12.8 (Rev. CoP13), the CITES Animals Committee formulated recommendations at its twenty-first meeting (Geneva, May 2005) to nine range States where the species was categorized as "of urgent concern" and to 26 range States where it was categorized as "of possible concern". Mongolia was among the States that, in 2006, received a notification of urgent concern and therefore should suspend the issuance of export permits for Saker falcon. Mongolia implemented several measures to conserve and restore the population of Saker falcons in the subsequent years and, as a result, the population of this species increased significantly, which was decisive in the Animals Committee's approval in 2011 to allow Mongolia to export 300 Saker falcons. In the same year, Mongolia established a quota for 2011 and 2012 for the export of the species and signed agreements with Kuwait, Qatar, Saudi Arabia and United Arab Emirates for the capture of 203 Saker falcons.

Reports from the General Authority for Border Protection and the Customs General Administration identify a number of species that have been caught at the international borders of Mongolia while being smuggled, including brown bear (paws, gallbladder), grey wolf (skin, tongue), Pallas Cat, marmot, fox (skin), pine nuts, desert cistanche and *Saposhnikovia divaricata*.

In 2006, the World Bank supported a research project conducted by the Wildlife Conservation Society, whose report, "The Silent Steppe", concluded that the international trade of animal meat and medicinal products was increasing in Mongolia. So was the wildlife trade of animal organs for medicinal use.

Mongolia has endeavoured to establish protection measures that safeguard the most threatened species. As of 2017, 27,953,449.98 ha (17.87 per cent of the country's territory) is under protection as state special protected areas (SPAs). The protected areas cover a very significant part of the distribution areas of species such as the snow leopard, wild ass, red deer, musk

deer, argali and ibex, and other illegally hunted animals.

In the last 20 years, several programmes were adopted to protect specific species, including the National Programme on the Conservation of Red Deer (2000), National Programme on the Conservation of Argali (2012, no longer valid), National Programme on the Conservation of the Snow Leopard (2005), National Programme on the Conservation of Saker Falcon (2003, no longer valid), National Programme on the Conservation of Musk Deer (2009) and National Programme on the Conservation of Gobi Bear (2013). However, there is insufficient reliable and systematic information on the results of these programmes. Monitoring remains a significant challenge. Insufficient information is provided to the public. A comprehensive national data base on the status of CITES species, permits and certificates conferred and events related to illegal hunting is not available to support decision-making and future action.

For many of the activities undertaken to fulfil the obligations deriving from CITES, Mongolia has had the support of many active partners and organizations. Such support has largely contributed to successful implementation (box 6.1).

The main priorities in the context of implementation of CITES are improving the capacity of law enforcement agencies, strengthening the mechanisms for engaging the public in the fight against illegal hunting by disseminating more information about the importance of conserving Mongolia's natural values, developing further actions to effectively combat illegal hunting and overcoming the human, technical and financial constraints on the work of the Managing Authority.

### Convention on the Conservation of Migratory Species of Wild Animals

In 1999, Mongolia ratified the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention). In addition to the Climate Change and International Relations Department of the Ministry of Environment and Tourism, the Institute of Biology of the Mongolian Academy of Sciences, the National University of Mongolia, WWF Mongolia Programme Office, Snow Leopard Conservation Foundation and Wildlife Conservation Society are also involved in activities for the conservation of migratory species. Research on migratory wild species has been conducted in collaboration with international experts, mainly from Austria, Germany, Japan, the Russian Federation and the US.

Mongolian territory plays a significant role in the conservation of migratory species. Many species inscribed in Appendix 1 and Appendix 2 of the Convention spend certain periods of the year in Mongolia: 21 species, including the snow leopard, Bactrian camel and Siberian crane, are inscribed in Appendix 1 to the Convention while 177 are inscribed in Appendix II.

Under the auspices of the Bonn Convention, Mongolia has signed three MoUs: on the Siberian crane in 2004, birds of prey (Raptors) in 2008 and saiga antelope in 2010. The country adopted several national programmes/action plans on the conservation of migratory species: argali sheep in 2012, Saker falcon in 2003, snow leopard in 2005, saiga in 2007 and taimen in 2007, and on the protection and farming of fish in 2008.

#### **Box 6.1: Examples of international cooperation efforts for the protection of endangered species listed in Appendix I of CITES**

Takhi, or Przewalski's horse, is one of the seven equid species in the world. It was categorized as extinct in the wild in the 1960s. Reintroduction of this species to Mongolia was only possible due to the effort and support of several countries, especially the Netherlands, and many institutions worldwide, such as the Foundation for the Preservation and Protection of the Przewalski Horse, the Wageningen University (Netherlands), Universities of Tokyo, Azabu, Tsukuba, Okayama, Rakuno, Gakuen (Japan), Senckenberg Museum of Natural History of Goerlitz (Germany), Zoological Society of London (UK), Cybella Planet Association (France) and Minnesota Zoo and Smithsonian Institution (US). It is a successful international cooperation story that has greatly contributed to global nature conservation. The population now consists of more than 300 mature individuals and is listed in Appendix I with a global status of Endangered.

Although hunting of snow leopards has been prohibited in Mongolia since 1972, the population continued to decline. In 1997, WWF in Mongolia started a project to support snow leopard conservation, developing a Snow Leopard Management Plan in Turgen and Tsagaan Shuvuut protected areas. From 1997 to 2002, the snow leopard population increased in WWF's project area: in Turgen from 29 to 48 and in Tsagaan Shuvuut from 4 to 18. Prey populations were stabilized or increased in the same areas. Full support for conservation measures has been obtained from the local population.

In addition to the specific national programmes, Mongolia adopted several laws – namely, on fauna (2012), natural flora (1995) and special protected areas (1994) – and hunting bans, which provide the main legal framework for the conservation of migratory species. The National Programme for the Conservation of Rare and Endangered Species, adopted in 2011, aims at supporting the improvement of conservation and preservation of rare wildlife.

In 2000, the National Committee and Scientific Council for the Bonn Convention were established by the then Minister of Nature and Environment and their membership was revised in 2010. There is insufficient information on the work developed by these two structures and on their effective role with regard to the implementation of the Convention.

Between 1999 and 2011, the country fulfilled its reporting obligations under the Convention, including with regard to the three MoUs. Since then, Mongolia has not reported regularly. UNDP and the WWF Mongolia Programme Office have supported Mongolia in the development and publishing of the national reports.

Despite the conservation efforts undertaken and improvements achieved, notably, the successful reintroduction of wild horses to their homelands, some threats to the conservation of migratory species persist, namely, the insufficient consideration of migratory species in the planning, licensing and development of economic activities such as mining and herding, as well as the development of infrastructure. In a country with an immense territory, without hunting zones established, illegal hunting continues to pose a significant threat and the absence of a comprehensive and systematic monitoring system leaves its true impact unknown.

After a decade of intense activity, from 2011 onwards, the development of legal, regulatory and project-based actions for the implementation of the Bonn Convention slowed down. In the past, the country actively discussed within the meetings of the parties the inclusion of additional species in the Appendixes of the Convention; currently, this will is no longer confirmed.

In 2014, the Conference of the Parties of the Bonn Convention adopted the Strategic Plan for Migratory Species 2015–2023, adapting for migratory species purposes the Strategic Plan for Biodiversity 2011–2020 of the CBD, including the Aichi Biodiversity Targets. The five goals and corresponding performance targets must now be integrated into relevant policies and planning instruments. Mongolia

has not yet put in place measures towards the implementation of goals and targets of the Strategic Plan for Migratory Species 2015–2023.

#### *Convention concerning the Protection of the World Cultural and Natural Heritage*

Mongolia became a party to the Convention concerning the Protection of the World Cultural and Natural Heritage in 1990. The Mongolian National Commission for UNESCO operates under the Ministry of Foreign Affairs. Mongolia has five properties inscribed in the World Heritage List, of which three are under the category of cultural heritage and two under the category of natural heritage: Uvs Nuur Basin, inscribed in 2003, and Landscapes of Dauria, inscribed in 2017.

#### Uvs Nuur Basin

The Uvs Nuur Basin (1,068,853 ha) is the northernmost of the enclosed basins of Central Asia. Shared by Mongolia and the Republic of Tuva in the Russian Federation, Uvs Nuur Basin is a transnational World Heritage property in the heart of Asia. The Basin covers the neighbouring territories of the north-western part of Mongolia and a part of the Russian Federation's Republic of Tuva located on the southern frontier of the Russian Federation. It takes its name from Lake Uvs Nuur, a large, shallow and very saline lake, important for migrating birds, waterfowl and seabirds. The Uvs Nuur Basin transnational World Heritage property is formally protected public land in its entirety in both countries. The site is made up of 12 protected areas representing the major biomes of eastern Eurasia. The steppe ecosystem supports a rich diversity of birds and the desert is home to a number of rare gerbil, jerboas and the marbled polecat. The mountains are an important refuge for the globally endangered snow leopard, mountain sheep (argali) and the Asiatic ibex.

The property is not only an excellent example of cooperation in the conservation of a shared ecosystem across an international boundary but also of cooperation between governmental, scientific and non-governmental institutions. Several bilateral agreements at the level of the responsible ministries and the PAAs formally underpin cooperation and joint management planning. Border Protection staff assist in the protection of the property on a permanent basis on both sides of the border. A Joint Mongolian–Russian Federation Management Plan for Uvs Nuur Basin is being implemented by the two countries. The main challenge for the proper management and conservation of Uvs Nuur Basin is the availability and

predictability of financial resources, since their main source is the donor community.

### Landscapes of Dauria

The inscription in the World Heritage List of the Landscapes of Dauria results from a joint initiative of Mongolia and the Russian Federation. This area has been the subject of a long history of cooperation between the two countries and also the People's Republic of China, which established in 1994 the Chinese–Mongolian–Russian Dauria International Protected Area (DIPA).

Shared by Mongolia and the Russian Federation, the Landscapes of Dauria is a transboundary serial World Heritage property of four component parts. It is an outstanding example of the Daurian steppe ecosystem, which covers over 1 million square kilometers, extending from eastern Mongolia to Russian Siberia and into north-eastern China. The serial property covers a total of 912,624 ha and comprises several protected areas in the northern part of the Daurian steppe ecoregion that occupy large areas of the transition from taiga to desert, including various steppe ecosystems. The inscribed property includes the nationally designated core and buffer zones of most of the Daurian State Nature Biosphere Reserve and the Valley of Dzeren Federal Nature Refuge (Russian Federation), as well as the core zone and a large part of the buffer zone of the Mongol Daguur Strictly Protected Area and the Ugtam Nature Refuge (Mongolia). Most of this property is surrounded by a World Heritage buffer zone of 307,317 ha, which overlaps with Ramsar sites and UNESCO biosphere reserves in both countries (Mongol Daguur in

Mongolia and Torrey Lakes in the Russian Federation).

### Tentative List

Mongolia has 12 properties submitted on the Tentative List, two of which are under the category of natural heritage, namely, Desert Landscapes of the Mongolian Great Gobi (2014) and Cretaceous Dinosaur Fossil Sites in the Mongolian Gobi (2014).

### Lake Baikal property

The World Heritage Committee (WHC) has been closely following Mongolia's development plans with regard to dams that may have an impact on the Lake Baikal property, located in the Russian Federation. At its thirty-seventh session in 2013, the WHC noted with concern the potential impacts on the Lake Baikal property from the planned construction of a dam on the Orkhon River in Mongolia and also requested the State Parties of the Russian Federation and Mongolia to "provide more information on the status of these plans, as well as on the environmental impact assessments which are foreseen to quantify these potential impacts". The WHC has adopted Decisions in 2014, 2015 and 2016 requesting Mongolia to ensure that no dam development on the Orkhon or Selenga Rivers proceeds before the potential impacts, including cumulative impacts, of these projects on Outstanding Universal Value have been duly assessed, in conformity with IUCN's World Heritage Advice Note on Environmental Assessment, and a copy of the environmental impact assessment of these projects is provided to the World Heritage Centre.

**Photo 6: Orkhon Valley**



Mongolian authorities acknowledge the procedures they will need to follow with regard to WHC's concerns and Decisions, for all dams the Government decides to build in the rivers referred to and they have provided the Committee with the information required in respect of one dam, which it has been decided to construct.

### Man and the Biosphere Programme

The longstanding relations between Mongolia and UNESCO are also visible in the work carried out by the country within the framework of UNESCO's Intergovernmental Programme for Man and the Biosphere (MAB) and the related regional network of East Asian Biosphere Reserve Network. The Mongolian National MAB Committee is chaired by the Director of the Protected Areas Management Department of the Ministry of Environment and Tourism. Mongolia has six biosphere reserves (table 11.4).

### *Water*

#### Convention on the Law of the Non-Navigational Uses of International Watercourses

Mongolia is not a party to the Convention on the Law of the Non-navigational Uses of International Watercourses, although accession to the Convention is currently under consideration, according to the Ministry of Foreign Affairs.

#### Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Mongolia has taken part, as an observer, in the Meetings of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes in 2009, 2012 and 2015 and has participated in a number of other meetings and activities under the Convention. DIPA is part of the ECE-INBO global network of basins working on climate change adaptation.

### *Ozone layer protection*

Mongolia acceded to the Convention for the Protection of the Ozone Layer (Vienna Convention) and to the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol), including the London and Copenhagen Amendments, in 1996. In 2002 and 2008, Mongolia ratified the Montreal Amendment and the Beijing Amendments respectively. The very recent 2016 Kigali Amendment, which adds hydrofluorocarbons (HFCs) to the list of controlled substances, has not yet been

ratified, although work towards its ratification is ongoing in the country and it is expected to be ratified in 2018.

In 1999, Mongolia established the National Committee to Implement the Vienna Convention for the Protection of the Ozone Layer (Order of the Minister of Nature and Environment No. 53, dated 22 April 1999) to coordinate all the policies and compliance activities for the implementation of the Montreal Protocol. The National Committee was chaired by the ministry responsible for environmental issues and included representatives from the Customs General Administration, other relevant ministries, NGOs and academia.

In 2016, a renewed composition of the National Committee was approved. The National Committee now has a total of 20 members from related ministries and agencies, including the National Ozone Authority, Ministry of Environment and Tourism, Ministry of Health, Ministry of Mining and Heavy Industry, Ministry of Energy, NEMA, Ministry of Foreign Affairs, NSO, Mongolian Agency for Standardization and Metrology, Customs General Administration, GASI, Ministry of Food, Agriculture and Light Industry, Ministry of Construction and Urban Development, Ministry of Education, Culture, Science and Sports, Mongolian Heating, Ventilation, Air-Conditioning and Refrigeration Association and Mongolian Building Material Manufacturers Association.

The National Ozone Authority (NOA) was established within the ministry responsible for environmental issues in December 1996 as part of the Institutional Strengthening Project funded by the Multilateral Fund for the Implementation of the Montreal Protocol and on the basis of the National Ozone Layer Protection Programme approved by 1996 Government Resolution No. 129. NOA coordinates the daily implementation of the Montreal Protocol, and among other responsibilities: controls and reports on ODS consumption, import and export; coordinates with international bodies and regional units; implements initiatives to improve public awareness on ODS impacts; and submits to the Minister of Environment and Tourism proposals for annual quotas for the import of ODS and equipment. Licences for the import and export of ODS and equipment are issued and signed by the Director of Environment and Natural Resources Management Department of the Ministry and Director of NOA.

NOA promotes close cooperation with private institutions and companies that deal with ODS equipment and servicing and works closely with other

public institutions, such as the Customs General Administration (which controls the import and export of ODS and ODS-based equipment), GASI (which controls the use of ODS and other chemicals), Mongolian University of Science and Technology (which trains technicians to handle ODS) and Mongolian Refrigeration Association and National Training Centre "Master Potentials", which were established under the HCFC Phase-out Management Plan (HPMP). NOA is now working very closely with the Ministry of Construction and Urban Development and Ministry of Energy.

In the institutional set-up for the implementation of obligations deriving from the international ozone treaties, the Customs General Administration and GASI have important roles, the first being responsible for controlling the import and export of ODS and ODS-based equipment and the second for controlling the use of ODS and other chemicals.

To reinforce the capacity to ensure the successful implementation of the Terminal Phase-out Management Plan (TPMP), a Project Management Office was established in 2011 under NOA, adding two full-time staff to the existing three full-time staff of NOA. NOA has been working in close collaboration with the Project Management Office, in particular, in establishing annual work plans and enforcing ODS regulations, monitoring the implementation of the HPMP and preparing progress reports.

Mongolia's main use of ODS in the past was using CFCs for the servicing of refrigeration and air-conditioning equipment. Following the implementation of the Refrigerant Management Plan (RMP) and TPMP for the phase-out of CFCs and ODS other than HCFCs, between 1998 and 2010, Mongolia successfully phased out the consumption of CFCs in accordance with the Montreal Protocol schedule.

Mongolia does not produce hydrochlorofluorocarbons (HCFCs). The import of HCFCs is aimed at two economic activities, the foam manufacturing and servicing sectors. An HPMP for Mongolia was approved by the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol in 2011. The HPMP aims at a 35 per cent reduction in HCFC consumption by 1 January 2020, compared with the baseline level of 1.31 ODP tons, which refers to the average HCFC consumption in 2009 and 2010. The HPMP is being implemented with the assistance of the Government of Japan and UNEP, with a total cost of US\$366,000. In 2016, the Executive Committee approved the third tranche of stage I of the HPMP.

Mongolia has had an operational licensing and quota system for the import and export of ODS since 2001, which is applicable to HCFCs. Before 2013, the country used the issuance of licences as a way to monitor HCFC imports and importers received the amount they requested in their ODS import licences. After the establishment of the baseline/national consumption target, from 2013 onwards, the country has fixed annual quota levels. Each year, the Minister of Environment and Tourism establishes by ministerial decree the ODS quota for the following year. The Government has already issued HCFC import quotas for 2017 in line with its agreement with the Executive Committee (0.77 ODP tons). Mongolia has also put in place control of the import of ODS-based equipment, including HCFC-based equipment.

In the 20 years of implementation of international ozone agreements, the country has progressed notably. Mongolia has set up and enforced a comprehensive legal framework for ozone layer protection, starting from 1995, with the approval of two laws – the 1995 Law on Air (later replaced with 2012 Law on Air) and the 1995 Law on Protection from Toxic Chemicals (later replaced with the 2006 Law on Toxic and Hazardous Chemicals), which had provisions to regulate ODS (including HCFCs). These steps were followed in 1999 by the approval of Government Resolution No. 104 on procedures for the licensing of import, manufacture, sale and use of ODS and Government Resolution No. 129 on the National Ozone Layer Protection Programme in the same year. To complement the legal framework, some regulations were also adopted or reviewed. This is the case for the ban on new production of HCFC-22-based XPS foam, in place since 2013, and the inclusion of some of the HCFCs, namely HCFC-141b, in the List of Toxic and Hazardous Chemicals Banned or Severely Restricted in Mongolia when the list was updated in 2014. Additionally, the adoption of fiscal incentives was also of significant importance, such as the exemption from sales tax of HC-290-, HFC-32-, R-152a- and R-477-based equipment to encourage the use of refrigerants with low global warming potential (GWP).

Despite the adoption of the revised Law on Air in 2012 and of several complementary provisions within sectoral laws, such as the 2001 Law on Licensing (also known as the Law on Special Permission for the Operation of Entities) that establishes that economic operators engaged in the import, trade, and use of ODS and ODS-containing equipment should have a licence, the framework legislation especially dedicated to the ozone layer remains largely unchanged since 1999.

Beyond the legal framework developed by the country, there were many other efforts made, such as the extensive dialogue undertaken with China to organize border control on ODS trade, practical implementation of legal requirements such as the licensing/quota system, numerous training sessions conducted for refrigeration technicians and customs officers, awareness and communication activities and the operationalization of NOA and its Project Management Office. The HCFC survey, conducted from December 2008 to May 2009 for the purpose of obtaining a comprehensive picture of HCFC import and use on the ground in Mongolia as part of the HPMP preparation, is one of the implemented initiatives that should be underlined.

All these combined actions allowed the country to successfully implement the RMP and subsequently the TPMP, successfully phasing out the consumption of CFCs. The HPMP is being successfully implemented in accordance with the approved plan. The Government reported the consumption of 0.64 ODP tons of HCFC in 2015, which is 54 per cent below the country's baseline. Mongolia therefore fulfilled the 10 per cent reduction in HCFC consumption in 2015 foreseen in the Montreal Protocol schedule.

The licensing and quota system for HCFCs import/export has been enforced strictly, the XPS conversion has been successfully completed and HCFC consumption is fully controlled.

To achieve a 35 per cent reduction by 2020 implies that Mongolia will not slow down and will continue to implement, at both the policy and project levels, all necessary measures to enable the country to meet that target. In the near future, work in the areas of green procurement and green buildings is expected to be initiated. Preparatory work on the Kigali Amendment will require additional efforts with regard to the training of customs officers and refrigeration technicians.

### *Hazardous waste and chemicals*

#### Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

In 1997, Mongolia acceded to the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention).

The 2000 Law on Prohibition of Importing, Transit and Export of Hazardous Waste (no longer valid (chapters 1 and 10)) was very much a transposition of the basic elements of the Basel Convention, such as

the definition of hazardous waste that includes explosives, flammable liquids and solids, combustible or radioactive substances, substances that have toxic reactions with the soil, air or water or that produce combustible gases, oxidants, corrosives and organic peroxides. The Law confers on the relevant environmental authority on hazardous waste a mandate to specify and detail the definition of hazardous waste, a task that has not been accomplished fully. As such, Mongolia does not have in its legislative or regulatory framework a detailed definition of hazardous waste.

According to the Law on Prohibition of Importing, Transit and Export of Hazardous Waste, the transit of hazardous waste through the territory and the import of hazardous waste for the purposes of use, storage, temporary holding or destruction is prohibited. No distinction is made between waste for recovery or final disposal. The same Law authorizes the export of hazardous waste subject to an export permit to be issued by an environmental authority on hazardous waste and notification from importers.

With the aim to improve waste management, in 2003, Mongolia approved the Law on Household and Industrial Waste, later replaced with the 2012 Law on Waste Management, subsequently replaced with a new Law on Waste Management in 2017.

The Environment and Natural Resources Management Department in the Ministry of Environment and Tourism is the Basel Convention National Focal Point. The tasks pertaining to the Convention are handled by only one person who has very extensive functions, including the issuance of permits for collection, disposal, transportation, recycle and storage of hazardous wastes.

The management of hazardous waste in Mongolia entails significant challenges. The most substantial one is the absence of segregation and adequate means for disposal and processing of hazardous waste. In 2009, a feasibility study was undertaken on the construction of a hazardous waste treatment facility, but the project was not implemented. Except for medical waste, there is no environmentally sound hazardous waste management and disposal facility in Mongolia. Since 2012, the challenges have increased significantly, because, until then, hazardous waste was, for the most part, exported to other countries, namely, South Korea. However, in 2012, the People's Republic of China banned the transit of hazardous waste, which had already been banned by the Russian Federation, and since then Mongolia has ceased to export hazardous waste.

There is no national inventory on hazardous waste in Mongolia. A pilot project was implemented in Ulaanbaatar in 2009 but it was not followed up. Data on the generation and transboundary movements of hazardous waste and annual reports have not been reported regularly by Mongolia to the Basel Convention Secretariat. The Ministry of Environment and Tourism oversees and keeps track of transboundary movements of hazardous waste but the information is not recorded in a database.

Waste management in general is in the early stage of development in Mongolia. Relevant legislative acts have been approved but implementation remains a huge challenge, waste infrastructures are lacking and the status of the country in respect of waste in general, and hazardous waste in particular, is far from known. Taking into consideration that both neighbouring countries have banned the transit of hazardous waste, Mongolia will have to address hazardous waste management by itself. Improving the quality of waste management systems is established as a priority in Mongolia Sustainable Development Vision 2030 and therefore it is expected that considerable progress will be achieved in the near future.

Overall, Mongolia faces challenges in ensuring effective management of waste and associated infrastructure, strengthening the system for monitoring, control and reporting of waste movements and ensuring the necessary capacities of the institutions involved. The development of a Basel Convention electronic system for transboundary movements could support the authorities in their endeavours.

#### Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Mongolia ratified the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention) in 2001. The Environment and Natural Resources Management Department in Ministry of Environment and Tourism is the Contact Point and the National Chemicals Management Council is the Designated National Authority for industrial chemicals and pesticides.

Mongolia has submitted to the Convention decisions of no consent for the importing of 29 chemicals listed in Annex III of the Convention and subject to the Prior Informed Consent Procedure. These decisions operationalize the 2007 Government Resolution No. 95, which updated the list of prohibited chemicals in Mongolia.

Since 2004, Mongolia did not ensure the transmission of import responses for several chemicals in 18 cases and therefore did not comply with Article 10 of the Rotterdam Convention. Article 10 sets out the obligations of Parties with respect to the future import of chemicals listed in Annex I and requires that Parties submit to the Secretariat their import decision (whether a final or interim response) concerning the future import of the chemical.

#### Convention on Persistent Organic Pollutants

Mongolia ratified the Convention on Persistent Organic Pollutants (POPs) (Stockholm Convention) in 2004 and approved its National Implementation Plan (NIP) in 2006. The Environment and Natural Resources Management Department in Ministry of Environment and Tourism is the National Focal Point. The country has complied with its reporting obligations.

Within the framework of the 2006 NIP, several actions were implemented, specifically on legislation and regulations for POP activities, awareness-raising activities and training, and establishment of a laboratory. In 2005 and 2006, a preliminary inventory of POPs was carried out under the POPs Enabling Activities Project, supported by the United Nations Industrial Development Organization (UNIDO) and the Global Environment Facility (GEF). The inventory encompassed POP pesticides, PCBs and calculations on dioxins/furans and their potential sources.

Initially, 12 POPs were included in the Annexes to the Convention. The fourth and fifth meetings of the Conference of the Parties to the Stockholm Convention added nine substances to the Annexes in 2009 and another one in 2011. In 2012, with GEF financial support, under the project Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants, the country developed a national inventory on pesticides, industrial chemicals, dioxins and furans and PCBs. In 2014, on the basis of the inventory and the assessment analysis undertaken, an updated NIP was approved through 2014 Government Resolution No. 341. The updated NIP foresees 52 actions within 11 activities under five objectives, 35 per cent of which actions are for waste management improvement, 19 per cent for air pollution reduction and 10 per cent for soil pollution reduction.

The NIP gives an overview of Mongolia's level of compliance with the Stockholm Convention requirements in respect to the "initial POPs" listed in the Convention Annexes. It also presents an overview



of the newly listed POPs in Mongolia and provides information on how Mongolia is planning to address the newly listed POPs in an integrated manner. The overall objective of the updated NIP is to protect the environment and human health from the harms of POPs (chapter 10).

Mongolia has benefited from the support of the international community, in particular UNIDO, UNEP and GEF, for the work with regard to POPs. In 2014–2015, Mongolia was one of the five countries involved in the implementation of the Subregional Action Plan (Asia) for Polybrominated diphenyl ethers (PBDEs) Management and Reduction, approved in 2013, and supported by UNEP and GEF, in partnership with the Stockholm Convention Regional Centre for Capacity-building and the Transfer of Technology in Asia and the Pacific (SCRCAP) and the Basel and Stockholm Convention Regional Centre for the Asia and Pacific Region in China (BCRC-SCRC, China). The project aims at mapping pollution characteristics of PBDEs in the main waste recycling sectors, reducing the risks caused by PBDEs and proposing a regional pollution control strategy and national frameworks in Asia.

NIP implementation is ongoing. NIP activities and actions will be implemented in two phases (chapter 10).

#### Minamata Convention on Mercury

Mongolia ratified the Minamata Convention on Mercury in 2015. The Green Development Policy and Planning Department in the Ministry of Environment and Tourism is the National Focal Point.

In 2006, several legal and operational measures in respect of chemicals management were implemented in Mongolia, namely, approval of the Law on Toxic and Hazardous Chemicals, which substantially reformed the chemical management procedure, setting up a centralized system. The updated list of banned and severely restricted chemicals included mercury and cyanide in the category of severely restricted chemicals. In 2009, the ministries responsible for environment and for health and NEMA approved the procedures for the storage, transport and destruction of dangerous and toxic chemical materials (2009 Joint Order No. 28/40/29, revised by 2012 Joint Order No. A-50/378/565). Increased negative impacts on public health and the environment caused by illegal use of acute toxic mercury in mining extraction and processing were subject to extensive discussions in the National Council for Policy Regulation of Toxic and Hazardous Chemicals.

In 2007, a mercury and sodium cyanide spillage occurred in Khongor Soum of Darkhan-Uul Aimag. The incident triggered a more muscular response from the chemicals management authorities. Two nationwide inspection campaigns were carried out in 2007 and 2008 to identify contaminated sites. As a result of these inspections, 53 ha of land and dozens of wells were found to be polluted by mercury and cyanide and 145 grinding mills that used mercury were closed down. The Ministry of Environment and Tourism, in collaboration with the General Police Department, organized actions to incentivize citizens to inform the authorities of any illegal use and storage of chemicals; as a result, 17 kg mercury were confiscated. Additionally, four hazardous and toxic waste landfill sites were created and a total 128,444 m<sup>2</sup> of polluted land in 231 places scattered around 38 counties of 10 provinces were decontaminated.

Between 2013 and 2015, with support from GEF and UNIDO, a project, Reduce Exposure of Mercury to Human Health and the Environment by Promoting Sound Chemical Management in Mongolia, was undertaken. It involved the Ministry of Environment and Tourism, the Ministry of Health and the private sector, namely, Mireco. The project aimed to develop national guidelines for environmentally sound management of waste containing mercury and demonstrate sound mercury remediation and stabilization techniques at the pilot scale in mercury hotspot areas contaminated from previous mining activities. According to the Ministry of Environment and Tourism, a mapping of mercury hotspot areas has been made, but it is not publicly available.

Recent estimates of anthropogenic mercury emissions in Mongolia point at 6,906 kg. Two very important projects have been approved by GEF during the course of 2017. The Advanced Minamata Initial Assessment in Mongolia, with UNIDO as the implementing agency, will support policy development and strategic decision-making. The Development of National Action Plan for Artisanal and Small-scale Gold Mining, with UNEP as the implementing agency, will be instrumental in supporting the country to establish a roadmap of actions to address the emissions and releases to the environment of mercury from those activities. Artisanal and small-scale gold mining, together with coal-burning and non-ferrous metals are considered to be the main sectors responsible for mercury emissions in the country. The challenge in developing this Action Plan is in finding appropriate actions and measures that will enable pursuit of the desired goals while reflecting the complexity related to the illegal nature of many mining activities.

While, unequivocally, the country's work on the Minamata Convention allows anticipation that strong progress in its implementation will happen in the near future, Mongolia faces one limitation that needs to be overcome: the lack of a facility for the collection and treatment of mercury.

### Strategic Approach to International Chemicals Management

In 2008, the National Chemicals Management Profile was concluded, providing the framework for implementation of the Strategic Approach to International Chemicals Management (SAICM) in Mongolia, which has as its National Focal Point the Green Development Policy and Planning Department in the Ministry of Environment and Tourism. United Nations Institute for Training and Research (UNITAR) projects contributed significantly to the implementation of SAICM in Mongolia; these included Updating National Chemicals Management Profiles, Development of a National Strategic Approach to International Chemicals Management (SAICM) Capacity Assessment, and Holding of a National SAICM Priority Setting (with the financial support of the SAICM Quick Start Programme Trust Fund), and Strengthening Governance, Civil Society Participation and Partnerships within an Integrated

National Chemicals and Waste Management Programme (with the support of Switzerland), both implemented in 2007.

Following the international agreement to set up the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Mongolia updated its national classifying and labelling standards according to GHS in 2009. The country has been struggling to keep up with international developments in chemicals management, and significant challenges remain with regard to effective implementation of the legislation, development of public awareness, building further capacity in the public institutions dealing with chemicals, overcoming the deficit in regard to laboratory equipment and implementing a nationwide remediation programme for contaminated sites.

Mongolia does not have facilities for the treatment of hazardous chemicals. Environmental protection policies and practices for the use of chemicals in agriculture and in mining are yet to be developed.

### *Sustainable Development Goals and targets relevant to this section*

The current stand of Mongolia's vis-à-vis Target 11.4 is described in box 6.2.



#### **Box 6.2: Target 11.4 of the 2030 Agenda for Sustainable Development**

### **Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable**

#### **Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage**

Mongolia has ratified five of the seven key UNESCO conventions in the field of culture, thereby demonstrating its commitment to the promotion of cultural diversity, the preservation and promotion of tangible and intangible heritage, and the fight against the illicit trafficking of moveable heritage. There is an expressive public awareness about the significance of cultural and natural heritage for national identity. The recent designation, in 2017, of the Landscapes of Dauria as the second natural heritage property is an important success.

In the Mongolia Sustainable Development Vision 2030, the country establishes as one of its priorities to become the international destination for nomadic culture and tourism, and defines several related objectives, such as improving the infrastructure and service quality of major natural and cultural heritage sites and exhibitions, creating Mongolia's unique tourism image on international platforms, developing ecotourism regions and products compliant with environmental and health requirements, and increasing the number of foreign tourists to two million annually, by 2030. Moreover, within this overarching strategy, Mongolia commits to preserving the natural landscape and biodiversity and ensuring the sustainability of ecosystem services. All natural and cultural heritage sites in the World Heritage List, except the recently inscribed Landscapes of Dauria, have management plans that are being implemented. The institutional framework for this target is represented by the Ministry of Education, Culture, Science and Sports and the Ministry of Environment and Tourism.

One of the serious challenges facing the country is to achieve a balance between economic growth and the preservation of its cultural and natural heritage and identity. Effective protection of cultural heritage requires that robust action is taken to reverse the increase in crimes relating to countries rich in cultural heritage, including theft, smuggling, looting and illegal sale of artefacts and that domestic financial resources with a medium-term perspective are made available. It is recommended that the ministries involved, in cooperation with the Mongolian National Commission for UNESCO, prepare and approve a plan of action against such crimes and that the Government foresees a four-year budget plan for the proper management of heritage sites.

### 6.3 Bilateral cooperation on environment, sustainable development and green economy

The revised 2011 Foreign Policy Concept (2011 Resolution of the State Great Khural No. 10) establishes the overarching principles for bilateral cooperation. Maintaining friendly relations with the Russian Federation and the People's Republic of China is the first priority of Mongolia's foreign policy activities. The second direction of Mongolia's foreign policy is the development of closer relations with highly developed countries of the West and East such as the United States, Japan and the Federal Republic of Germany. At the same time, Mongolia pursues promoting friendly relations with countries such as Austria, Denmark, Finland, India, the Netherlands, the Republic of Korea, Singapore, Sweden, Switzerland, Thailand and Turkey, and creating and bringing to an appropriate level their economic and other interests in Mongolia.

As of 2016, the Ministry of Environment and Tourism had established, with more than 30 countries, more than 170 bilateral agreements, MoUs, joint programmes and initiatives, of which 20 are intergovernmental. The main focus areas of cooperation are environmental conservation, water and forestry. The Republic of Korea (34 joint projects), the Russian Federation (28 joint projects), Japan, the People's Republic of China, Germany, the Netherlands and the United Arab Emirates are the countries with which Mongolia has had more active bilateral cooperation.

#### *Bilateral cooperation with the Russian Federation*

Three bilateral agreements – on environment, transboundary waters and protection of forest from fires – have been signed between Mongolia and the Russian Federation.

#### Environmental protection

The first agreement was signed in 1994 and provides a general framework for enhancing cooperation on a vast number of environment issues, such as: transboundary air pollution; transboundary water bodies; mineral resources, energy and groundwater; soil and land resources; desertification; flora and fauna; specially protected natural areas; monitoring and assessment; climate change and the ozone layer; radiation; environmentally friendly technologies; EE and training of staff.

Within the framework of the 1994 agreement, a Joint Mongolian–Russian Environmental Protection

Commission was established and, as of mid-2017, it has convened six times. The Commission has provided a good platform for advancing cooperation, especially in the domain of transboundary protected areas, which is considered a priority activity for the Commission.

Istoki Amura was one of the transboundary protected areas established following discussions and agreement reached at the Commission meetings. Also with the aim of preserving transboundary populations and groups of rare and endangered wildlife, the Commission established a joint working group for development of a programme for the conservation of argali in the Russian–Mongolian transboundary area. The Commission has also decided to sign an intergovernmental agreement on establishing a specially protected crossborder area of Khuvsgul-Tunkhen and Siilkhem, and to organize workshop meetings of researchers and specialists on monitoring and control of transboundary migratory animals, specifically, argali and snow leopards.

#### Transboundary waters

In 1995, the Governments of Mongolia and the Russian Federation agreed to cooperate for the protection and use of transboundary waters, based on the principles of equitable and mutually beneficial water resources management. Cooperation between the two countries is foreseen in some key areas, such as: i) the rational use and protection against pollution and depletion of water resources of transboundary waters for the environmentally sound management of water resources; ii) study of the water, hydrochemical, hydrobiological and channel regimes of water bodies, water resources, and their quality; iii) exchange of hydrological information and forecasts with a view to preventing floods and their negative consequences; iv) study and assessment, as well as forecasting the state of transboundary waters; and v) protection of transboundary waters from pollution and control of their quality, ensuring the conditions for natural migration of fish and other aquatic animals in transboundary waters.

Within the agreement on transboundary waters, the parties committed to several joint tasks – among others, the development of "uniform basin concepts" for the protection and use of transboundary waters, the development and implementation of programmes for monitoring the status of transboundary waters, determining the interstate distribution of water resources for specific water bodies and exchanging information on implementation of water management and water protection measures.

As part of the agreement, an institutional mechanism was created, called the Institute of Plenipotentiaries, which is an annual meeting (although it has not always been held) of representatives from both countries to discuss the current status of shared water resources. The current plenipotentiaries mechanism has a limited scope – the tasks and responsibilities are defined in very general terms – and does not have substantive decision-making or policy-setting powers. The enhancement of the transboundary institutional mechanism would require a revision of the 1995 agreement in the sense of making the agreement more compatible with more up-to-date requirements, e.g. those related to EIA in a transboundary context, notification and consultation regarding planned activities that are likely to cause transboundary impact, access to information and public participation in decision-making, and a detailed dispute settlement mechanism.

In the period from 2011 to 2015, the UNDP–GEF project Integrated Natural Resource Management in the Baikal Basin Transboundary Ecosystem was implemented in partnership with the Russian Federal Ministry of Natural Resources and Environment and the Mongolian Ministry of Environment and Green Development. The project objective was to spearhead integrated natural resource management of Lake Baikal Basin and Hövsgöl Lake and to ensure ecosystem resilience and reduced water quality threats in the context of sustainable economic development. One of the project's conclusions was the relevance of revising and updating the 1995 agreement, so that an enhanced cooperation framework that can support transboundary integrated natural resource management based on current international norms and standards, and an enhanced joint institutional mechanism, would be established. The 1995 agreement has not yet been revised, however.

#### Forest fires

Protection of forest from fires is the subject of the third bilateral agreement signed by Mongolia and the Russian Federation in 2014. This agreement aims at improving the work on the prevention and suppression of forest and steppe fires in the border areas, reducing the damage caused by them and providing mutual assistance and exchange of experience in combating forest and steppe fires.

Mongolia and the Russian Federation established a zone of joint protection of forest and steppe areas from fires, which includes a 10-km-wide strip in the territory of each party from the state border line between the two countries.

Discussions and decisions with regard to cooperation in forestry take place within the framework of the Joint Mongolian–Russian Environmental Protection Commission. Information-sharing schemes have been operationalized and agreements allowing smooth crossing of the state borders by emergency workers fighting crossborder forest fires have been reached.

#### *Bilateral cooperation with the People's Republic of China*

Cooperation between Mongolia and the People's Republic of China started formally in 1989 and is focused on the protection and monitoring of transboundary rivers and lakes, conducting routine cross-border monitoring, combating yellow dust and desertification, protecting transboundary wildlife, promoting EE, improving public awareness about the environment and capacity-building for environmental management.

Several agreements, protocols and contracts have been signed between Mongolia and the People's Republic of China in the period 1989–2016, covering environment protection in general, protection of forest and grassland from fire, and water protection and use.

One of the key areas of bilateral cooperation is transboundary water-related issues. Within the framework of the 1994 Intergovernmental Agreement between Mongolia and the People's Republic of China on Transboundary Water Protection and Utilization, the first meeting of the respective Joint Commission was held in 1998 and a roadmap with concrete activities was adopted.

Under the Joint Commission, a team of experts has undertaken significant work in several areas: transboundary water studies; water quality monitoring and information exchange; water quality standards, indicators and analytical methods; flood prevention, disaster mitigation and cooperation in emergency situations; cooperation on the rational use and protection of water resources; identification of joint actions in emergency situations; initiatives on conservation and sustainable use of water resources; identification of sources of pollution that may affect transboundary waters; studying preventive measures; planning measures to mitigate adverse impacts; and expanding border-water relations. In 2014, through an MoU, the two countries committed to establishing joint topography and measurements on Lake Buir and its surrounding area.

### Other bilateral cooperation

Cooperation with "third neighbours" advanced significantly during the last 20 years. Japan and the Republic of Korea are the countries with which Mongolia has cooperated most, namely in the area of green development.

Cooperation with Japan has focused on the implementation of large projects and programmes aimed at decreasing GHG emissions, introducing eco-friendly technologies, expanding the utilization of renewable energy sources in the reduction and mitigation of climate change impacts, and adaptation to climate change. Both countries have also collaborated in combating the yellow dust storms, strengthening capacities for measuring and reporting on GHG mitigation measures and planning green development. Cooperation between the countries' respective ministries responsible for environmental issues was first established by organizing the Policy Dialogue for the environmental sector in 2006. Since 2006, the Policy Dialogue has been organized annually and, as a result, an MoU for mutual understanding and cooperation was signed between the two ministries in 2011. A new MoU was signed in 2015.

Green development has also been one of the main focus areas of cooperation between Mongolia and the Republic of Korea, especially since 2010 in the framework of the Korea Partnership for Green Growth, including related issues such as new and energy-efficient technologies and green jobs. Combating desertification and yellow dust storms, constructing water and sanitation facilities in urban areas, improving the management of and strengthening the capacity for management of special protected areas, addressing the impacts of mercury pollution and rehabilitation of mining sites have also been the subjects of cooperation between the two countries. Since 2007, the Governments of Mongolia and the Republic of Korea have implemented the Green Belt joint project (chapter 13).

Since 1996, with the signature of the 1996 EC–Mongolia Cooperation Agreement, there has been significant progress in cooperation between Mongolia and the EU, which became one of the important "third neighbours" in Mongolian foreign policy. In 2013, a Partnership and Cooperation Agreement was signed, providing the legal framework for expanding EU–Mongolia relations. It covers such issues as political dialogue, trade, development assistance, cooperation in the field of agriculture and rural development,

energy, climate change, research and innovation, education and culture.

Individual EU Member States and other countries have supported numerous environment-related projects (box 6.3) as part of their bilateral cooperation efforts.

#### *Sustainable Development Goals and targets relevant to this section*

The current stand of Mongolia vis-à-vis Target 6.5 is described in box 6.4.

### **6.4 Participation in non-binding processes related to the environment, sustainable development and green economy**

#### *United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)*

Mongolia has always been significantly engaged in the work of ESCAP.

Mongolia has been a very active member of the North-east Asian Subregional Programme for Environmental Cooperation (NEASPEC), developed by the ESCAP East and North-East Asia Office, which aims to promote environmental cooperation in the subregion.

Within NEASPEC, and in particular under the programme Improving Environmental Sustainability, Mongolia has contributed to the implementation of activities in the five programme areas, namely, transboundary air pollution, nature conservation, marine protected areas, low-carbon cities, desertification and land degradation.

Mongolia has also received capacity development support from ESCAP in a significant number of areas, such as the implementation of integrated energy–water resources management for green industries in cities in Mongolia, development of the system of environmental-economic accounting, promoting integrated resource management in cities and mainstreaming climate-change-related urban issues at the national and local levels.

As of 2017, ESCAP is conducting a Sustainability Outlook for Mongolia in the country. Mongolia is the first country to be subject to such a process. A Sustainability Outlook falls within the support provided by ESCAP to its Member States in their efforts to implement the 2030 Agenda for Sustainable Development in an integrated approach.

**Box 6.3: Bilateral cooperation examples on Energy Efficiency for All and Access to Safe Water**

Mongolia's coal-based power stations are struggling to keep up with increased demand and contribute to severe pollution, especially in winter. The German-funded Efficiency of Grid-based Energy Supply Schemes (ENEV) project (€3.9 million) supports Mongolia in developing an energy-efficiency strategy by analysing the entire electricity network and advising on appropriate tariffs, which can set incentives to save energy. With additional financial support from Switzerland (€3.8 million), it also supports the training of energy managers and auditors. This cooperation also focuses on improving the energy efficiency of selected public buildings. Along with official development assistance (ODA) loans, the power plant in the city of Darkhan (€10.5 million) and Power Plant 4 in Ulaanbaatar (€8.5 million) are being modernized in order to extend their lifespan and to contribute to the more environmentally friendly, uninterrupted and safer provision of power and heat.

A Czech-funded project has helped to upgrade the water supply system in the northern city of Murun in Khuvsgul Province, improving safety standards and ensuring that the infrastructure will cope with the expected population growth. The project involved repairing the water supply network, introducing automated pumping and water distribution controls, and building up the capacity of the local water and sewerage facilities. Exploratory works for new water sources have also taken place. This initiative, which received a Czech Government grant of €845 000, is very much in line with Mongolian national development objectives. Mongolia now aims to ensure that 90 per cent of the population is supplied with safe drinking water, and 60 per cent of the population uses improved sanitation and hygiene facilities, by 2030.

**Box 6.4: Target 6.5 of the 2030 Agenda for Sustainable Development****Goal 6: Ensure availability and sustainable management of water and sanitation for all****Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate**

Target 6.5 focuses on transboundary water cooperation, among other aspects. One of the two global indicators for this target is the proportion of transboundary basin area with an operational arrangement for water cooperation (Indicator 6.5.2). As of late 2017, Mongolia has not submitted its report on Indicator 6.5.2 to UNECE and UNESCO.

Mongolia has signed transboundary water agreements with both its neighbours: the Russian Federation and the People's Republic of China. The 1995 agreement with the Russian Federation covers rivers, streams, lakes and other surface water bodies, as well as groundwater bodies, which form or cross the state boundary. The 1994 agreement with the People's Republic of China covers Halaha River, Kerulen River, Lake Bor Nor and Bulgan River, as well as lakes, rivers, streams and other waters that straddle or stay on the boundary line; the agreement is silent with regard to groundwater.

There are 212 rivers and 10 lakes at the Mongolian border and transboundary with the Russian Federation; between Mongolia and the People's Republic of China there are 37 rivers and 12 lakes.

Existing agreements provide a different level of attention to water quality, environmental protection and public health. The agreement with the Russian Federation provides a more robust framework for action in terms of the management of transboundary water bodies, as it enables both countries to cooperate on the protection of transboundary waters from pollution, scarcity and adequate use, whereas the agreement with the People's Republic of China is very much focused on research and monitoring.

Aware of the mutual benefits arising from the application of the agreements in force, but with a view to improving them, Mongolia and the two neighbouring countries have opportunities to intensify cooperation in the domain of transboundary waters by reviewing existing agreements, for example, by including criteria for determining water flow regimes, strengthening notification and consultation procedures and integrating the key principles of IWRM, including the basin approach, into the agreements.

Mongolia may also wish to consider acceding to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the Convention on the Law of the Non-navigational Uses of International Watercourses as part of its efforts to strengthen IWRM and transboundary water cooperation.

The Sustainability Outlook for Mongolia will present the baseline as of 2017 in Mongolia in respect of all SDGs, including an SDG profiling and identification of the current institutional frameworks that are supporting the SDGs implementation process, as well

as sectoral priorities and relations and commitments to international agreements. It will also provide a mapping of environmental, social and economic SDG-related aspects of the national vision across sectors and policy integration at the national and local levels, as

well as an assessment of resources and capacities for socioeconomic development in the specific sectors. The Sustainability Outlook for Mongolia, together with the current Environmental Performance Review, will feed into a document that will be a compass for action in the country towards attainment of the SDGs: "Pathways for Implementation of the Internationally Agreed Commitments of Mongolia".

*Ten-year framework of programmes on sustainable consumption and production patterns*

The National Focal Point for the 10-Year Framework of Programmes on Sustainable Consumption and Production has not yet been nominated. Notwithstanding this, Mongolia has taken up the challenge of making its resource use more efficient through its 2016 Action Plan for the Implementation of Green Development Policy for the period 2016–2030, which has Sustainable Consumption and Production as a first strategic objective. The Plan aims to "promote resource-efficient and low-waste technologies for the mineral resources sector", bringing Mongolia's resource efficiency closer to regional levels.

UNEP, through the EU-funded SWITCH-Asia Programme, is supporting the country in mainstreaming resource efficiency and sustainable consumption and production into its economic development by strengthening its policy framework and monitoring capacity for resource efficiency and sustainable consumption and production.

*Partnership for Action on Green Economy (PAGE)*

Mongolia was the first country to join PAGE, in 2013,

and is leading the way in advancing green economy policies. In June 2014, the Green Development Policy for Mongolia was approved, aiming to ensure that green development becomes one of Mongolia's fundamental goals. The Green Development Policy establishes goals and objectives for green development until 2030 and outlines actions to ensure these goals are achieved (chapter 1).

PAGE supported the country in formulating and implementing green economy policies. The Green Economy Stocktaking Report, developed in consultation with key local, national and international partners and published in 2014, provided an important contribution to the subsequent work of Mongolia on green development. A green jobs mapping exercise was also carried out at the end of 2013 as part of the inception phase of PAGE.

*Sustainable Development Goals and targets relevant to this section*

The current stand of Mongolia's vis-à-vis Target 12.1 is described in box 6.5.

## 6.5 Legal, policy and institutional framework

*Legal framework*

International agreements that Mongolia has ratified or acceded to prevail over other laws that might conflict with an international agreement.

The 1993 Law on International Agreements applies to all multilateral international agreements governed by international law and concluded in written form. The Law regulates the process of preparing and concluding the ratification/accession process.



### Box 6.5: Target 12.1 of the 2030 Agenda for Sustainable Development

**Goal 12: Ensure sustainable consumption and production patterns**

**Target 12.1: Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries**

Most related policy priorities for Target 12.1 are identified in the 2014 Green Development Policy and 2016 Action Plan for the Implementation of Green Development Policy for the period 2016–2030.

The global indicator (12.1.1) is the Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies.

Although Mongolia does not have a standalone national action plan on SCP, the Green Development Policy and its Action Plan have specific actions towards mainstreaming SCP patterns in the areas covered by the 10-Year Framework of Programmes on Sustainable Consumption and Production, with the respective indicators.

### *Policy framework*

International cooperation in Mongolia is pursued within a well-defined policy framework provided by the Foreign Policy Concept adopted in 2011 and its overarching principles.

The Mongolia Sustainable Development Vision 2030 provides the strategic framework for all sector and cross-sector strategies (chapter 1). The definition of sectoral policies, their objectives and targets, should be cascaded from SDV 2030. Sustainable development and environmental priorities are clearly set within SDV 2030, while the green development priorities are established in the Green Development Policy. Both documents also set clear priorities for international cooperation on environmental issues. Following the approval of SDV 2030 and the Green Development Policy, it is expected that the Government will revise, where relevant, the existing sectoral strategies, legislation and regulations.

The overall policy outline contained in SDV 2030 is complemented by the specific policy framework provided by the plans and programmes developed and approved for many environmental domains, such as the National Programme for the Conservation of Rare and Endangered Species, National Implementation Plan (NIP) for the Convention on Persistent Organic Pollutants, National Ozone Layer Protection Programme and the several national programmes on the conservation of migratory species.

### *Institutional framework*

The responsibilities for international environmental cooperation are mostly concentrated within the Ministry of Environment and Tourism. Nearly all focal points for global environmental agreements are the heads (in a few cases, the staff) of the Ministry's Environment and Natural Resources Management Department, Climate Change and International Relations Department, Land Management and Water Policy Coordination Department, and Green Development Policy and Planning Department.

In respect of CITES and the Basel Convention, there is only one dedicated staff member responsible for all the functions related to the Convention, which is clearly insufficient for the tasks assigned. The problems encountered in reporting to some MEAs, namely CITES and the Basel Convention, also provide evidence that the size of teams is not sufficient.

In terms of international, regional and bilateral environmental cooperation, the Ministry for Foreign Affairs is very supportive of the work undertaken by

the line ministries, and plays an important role in facilitating cooperation and, in relation to accession to international agreements, assessing their conformity with Mongolia's Constitution and international obligations.

In order to ensure robust and full coordination with regard to international, regional and bilateral environmental cooperation, the Ministry of Environment and Tourism has, from its inception, had a department responsible for international cooperation. The main functions of the current Climate Change and International Relations Department are related to climate change activities; implementing and coordinating foreign cooperation policies in the environmental sector; mobilizing external financial resources for implementation of projects and programmes; and providing and monitoring the implementation of international and bilateral agreements, including contracts, ratified or signed by Mongolia and projects supported by the donor community.

To oversee the implementation of international agreements and ensure proper coordination of activities among ministries, levels of administration and, in some cases, academia and NGOs, intersectoral committees were established. This is the case for the Ramsar, CITES and Vienna Conventions.

## **6.6 International technical assistance**

The development of environmental, sustainable development and green development policies, and their implementation and enforcement in Mongolia, has been supported by many donors (chapter 3), among which organizations within the United Nations system have played the main role.

The United Nations Development Assistance Framework (UNDAF) 2017–2021 for Mongolia has been designed as an integrated programme that fosters cooperation, enhanced coordination and strengthened partnerships, in support of efforts to attain the 2016 Mongolia Sustainable Development Vision 2030.

UNDP has been a major partner in providing technical assistance to Mongolia in the field of the environment, sustainable development and green development, having supported, between 2007 and 2017, several projects with a total disbursement of more than €32 million.

Between 1991 and 2017, 83 projects were implemented in Mongolia with the involvement of the Ministry of Environment and Tourism and the financial support of international donors. As of 2017,



34 projects are being implemented with the involvement of the Ministry of Environment and Tourism, which focus on the following areas: sustainable management of natural resources, water, forests, green development and green economy, biosecurity and biosafety, policy coordination on hazardous chemicals and substances, climate change and adaptation to climate change (chapter 3). The database of projects available at the Ministry of Environment and Tourism mainly includes grants supported by many donors, such as: Austria, Canada, Denmark, Germany (GIZ, KfW), Japan, Kuwait, the Netherlands, Norway, Sweden, the United Arab Emirates, the United Kingdom, the United States, International Nordic Foundation, Technical Assistance to the Commonwealth of Independent States and Georgia (TACIS), FAO, GEF, UNDP, UNEP, ADB and the World Bank. Several projects aim at reinforcing capacity in environmental administration.

The World Bank, ADB and EBRD have provided funding for environmental projects to address air pollution and water management, and are providing loans to support renewable energy infrastructure.

Donor support for water supply and other municipal infrastructure and services commenced in the early 1990s and has progressively increased in recent years. Key donors active in these areas are the World Bank (urban services and space heating in Ulaanbaatar), JICA (master plan, solid waste management, and ger area improvements in Ulaanbaatar), Germany through GIZ (ger area improvements and energy-efficient housing), UNDP (urban governance) and the United States Agency for International Development (housing).

Mongolia has had the ADB as a key partner in policy development and implementation. The ADB's country partnership strategy 2017–2020 for Mongolia addresses key development challenges by supporting investments, policy reforms, capacity-building, and knowledge-sharing to sustain inclusive growth. To achieve this, the ADB will base its operations on three strategic pillars: (i) promoting economic and social stability; (ii) developing infrastructure for economic diversification; and (iii) strengthening environmental sustainability.

NGOs such as WWF have also given considerable support to Mongolia's endeavours in the field of the environment and sustainable development. WWF expertise has been involved in more than 100 projects in Mongolia, mainly focusing on providing technical assistance for conservation of biodiversity and landscapes, protection of endangered wildlife,

sustainable natural resources management, awareness-raising on biodiversity, water footprint assessments and effective protected areas management.

Overall donor coordination is under the responsibility of the Minister of Finance. However, it is the Climate Change and International Cooperation Department in the Ministry of Environment and Tourism that communicates directly with donors and potential donors on specific needs within the framework of the main policy options defined in the country in the strategic documents related to environmental protection and green development.

Although the resources channelled by donors are crucial to advancing environmental protection, sustainable development and green development, the country needs to further develop environmental infrastructure in various fields, such as waste, basic sanitation and chemicals, which will require capital-intensive investments. The financial needs of the country in the near future are likely to go well beyond the resources currently available from domestic and external sources.

## 6.7 Assessment, conclusions and recommendations

### *Assessment*

The aspiration of being a frontrunner in achievement of the SDGs, greening development policies and participating in MEAs is the main driver for advancing environmental protection in Mongolia. The prompt ratification of recent MEAs, such as the Minamata Convention on Mercury, provides evidence of the political importance that the Government attributes to being an engaged participant in international cooperation in the environmental domain. In environmental domains not covered by global MEAs, the country's progress has been more limited. This is the case, for example, in access to information and public participation in environmental matters.

Implementation and compliance with international obligations remains a challenge, due in part to insufficient human resources and capacity and financial resources in the Ministry of Environment and Tourism. Mongolia is very dependent on the international donor community in respect of technical expertise and financial resources. Effective response to the country's international agreements and commitments requires strengthening capacity and ensuring adequate financial resources for the Ministry of Environment and Tourism, as well as other involved entities, in a way that is consistent with the responsibility of being a party to MEAs.

Bilateral cooperation is a key vector of Mongolian foreign policy and has been particularly fruitful in the field of the environment. The country has been successful in establishing strategic partnerships with other countries, in particular with its closest neighbours and the other countries in the region, to ensure technical and financial support for achieving better environmental performance and standards and enhanced capacity for addressing environmental challenges.

### *Conclusions and recommendations*

#### Capacity, resources and efficient communication

Effective response to international agreements and commitments necessitates strengthened capacity and financial resources in the Ministry of Environment and Tourism in a way that is consistent with the responsibility of being a party to MEAs. Assessment of these needs, which would provide a good basis for matching the obligations and policy goals assumed with sufficient resources, has not been undertaken.

Guaranteeing efficient communication between MEA secretariats and Mongolian national authorities requires that the national focal points transmitted to the secretariats are always updated. Furthermore, there are not always the staff resources necessary to ensure proper follow-up to MEAs and smooth implementation of the obligations they carry.

#### Recommendation 6.1:

*The Ministry of Environment and Tourism should:*

- (a) *Undertake an in-depth analysis of the administrative and technical capacity and financial needs of the bodies and units charged with the implementation of the obligations deriving from MEAs;*
- (b) *On this basis, prepare an action plan for safeguarding the administrative and technical capacity and financial needs for the implementation of the obligations deriving from global and regional agreements on the environment;*
- (c) *Submit urgently to the relevant MEAs, through the proper procedures, communications on the appointment of the new national focal points;*
- (d) *Reinforce the number of staff devoted to MEAs, ensuring strengthened teams for MEAs with more intensive activities and reporting requirements.*

#### Participation in MEAs to which Mongolia is not party

Mongolia's strong involvement in global MEAs has proven to provide a good impetus for developing policy, implementing actions and achieving better environmental performance. Mongolia is party to the vast majority of global MEAs. Nonetheless, a few gaps remain, and ratifying further MEAs would support the country in achieving a more comprehensive framework for protection of the environment. In this regard, accession to the recent Kigali Amendment to the Montreal Protocol is important, to enhance national efforts to protect the ozone layer.

Mongolia is not a party to the two international framework conventions on transboundary water cooperation, the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses. Participation in these Conventions would demonstrate the country's adherence to the principles and provisions of international water law. Participation in the 1992 Convention would also allow the country to benefit from the opportunities provided by the Convention's institutional platform.

#### Recommendation 6.2:

*The Government should:*

- (a) *Proceed with accession to the 2016 Kigali Amendment to the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer planned for 2018 and install the necessary control mechanism;*
- (b) *Analyse costs and benefits and consider accession to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses.*

#### Management plans for Ramsar sites

Although huge efforts have been undertaken to fulfil the obligations deriving from the international agreements to which Mongolia is a party, there are a few that still need to be accomplished in the context of the Convention on Wetlands of International Importance especially as Waterfowl Habitat. The designation of Ramsar sites entails certain obligations from the point of view of their management, irrespective of immediate need, supported by the understanding that the existence of such natural

values, and in particular their preservation, must be monitored and ensured. Not all designated Ramsar sites in Mongolia have management plans.

*Recommendation 6.3:*

*The Ministry of Environment and Tourism should approve the Ramsar site management plans of Lake Ganga, Lake Buir, Lake Achit and Lake Terkhiin Tsagaan.*

**IMPLEMENTATION OF RIO CONVENTIONS****7.1 Convention on Biological Diversity**

Mongolia became a party to the 1992 Convention on Biological Diversity (CBD) in 1993, contributing to its entering into force by becoming its 30th contracting party.

*Legal, policy and institutional framework*Legal framework

A broad set of legislation is relevant for the implementation of the CBD in Mongolia. Highlights include the 2012 Law on Forests, 2012 Law on Fauna, 1995 Law on Environmental Protection, 2012 Law on Environmental Impact Assessment, 2012 Law on Fees for Use of Natural Resources, 1999 Law on Seed Varieties and Crop Plants, 2016 Law on Crop Production, 1995 Law on Natural Flora, 2012 Law on Soil Protection and Desertification Prevention (chapters 1, 11 and 12).

Policy framework

In 1996, Mongolia adopted its first National Biodiversity Action Plan (1996 Government Resolution No. 163), consisting of 21 overall targets and 87 activities on research, protection and sustainable use of biodiversity and addressing cross-sectoral policies. Assessments of implementation were conducted in 2002 and 2010. The first concluded that there was a lack of coordination in implementation of the Action Plan and therefore a committee was established to oversee implementation and a government fund was created to facilitate it. The second assessment showed that, by 2010, 96 per cent of the planned activities had been concluded or were near completion.

Following the adoption of the Aichi Biodiversity Targets at COP 10 of the CBD in 2010, and the recommendation to parties to update their strategic action plans to reflect the CBD's Strategic Plan 2011–2020, in 2015, the National Biodiversity Programme (NBP) was approved for the period 2015–2025 (2015 Government Resolution No. 325). The NBP was elaborated with the involvement of several departments of the Ministry of Environment and Tourism, the Ministry of Justice, the National

University of Mongolia, SDC and WWF Mongolia, and with the financial support of UNEP.

The NBP 2015–2025 is currently the main policy framework for implementation of the CBD; it is fully aligned with the CBD's Strategic Plan 2011–2020 and the Aichi Biodiversity Targets. It takes into account the assessment results of the 1996 National Biodiversity Action Plan and the social and economic changes, which had impacts on the environment, that have occurred since the adoption of the first strategic document.

The NBP 2015–2025 focuses on integrating biodiversity conservation policies with poverty reduction policies and other relevant national and sectoral plans, and is set around four strategies (chapter 11): increase awareness, develop science-based policy, sustainable use of biodiversity, and improve policies and legal environment. Based on these strategies, the Mongolian contribution to reaching the Aichi Targets will be assessed, and 14 goals, 29 objectives and 74 outputs have been set. An initial evaluation is foreseen for 2020 and a final evaluation will be conducted in 2025. Reports on implementation will be presented every three years to the State Great Khural and every five years to the CBD Secretariat. As of mid-2017, an action plan is being developed by the Green Development Policy and Planning Department with the involvement of other departments of the Ministry and the financial support of GEF, UNDP and Germany, under the Biodiversity Finance Initiative (BIOFIN).

The 2016 Mongolia Sustainable Development Vision 2030 (SDV 2030) establishes as one of its objectives to preserve the natural landscape and biodiversity and ensure sustainability of ecosystem services. SDV 2030 has set the goal of having 25 per cent of its total territory as special protected areas by 2020, 27 per cent by 2025 and 30 per cent by 2030 (chapter 11) and to increase the forest area to 8.5 per cent of the total territory by 2020, 8.7 per cent by 2025 and 9 per cent by 2030 (chapter 13).

Implementation of the NBP 2015–2025 goals is conducted through the implementation of a broad set of policy documents. The most relevant instruments include the 2014 Green Development Policy, 2011 National Action Programme on Climate Change, 2010

National Action Programme to Combat Desertification, 2010 National Security Concept, 1997 State Policy on Ecology, 1998 National Programme on Special Protected Areas, 2011 National Programme for the Conservation of Rare and Endangered Species, 2008 National Programme for the Protection and Farming of Fish, 2005 Green Belt National Programme (chapters 1, 13), 2015 State Policy on Forests (chapters 1, 13), 2010 National Mongolian Livestock Programme (chapter 1), 2009 State Policy Towards Herders (chapter 1), 2015 State Policy on Food and Agriculture and 2014 State Policy on the Minerals Sector.

### Institutional framework

Currently, the National Focal Point for the CBD is the Climate Change and International Relations Department of the Ministry of Environment and Tourism. However, the Focal Point nominated for the CBD Clearing House is the Environment and Natural Resources Management Department and the National Focal Point for the Subsidiary Body on Scientific, Technical and Technological Advice is the School of Arts and Sciences of the University of Mongolia (which is also the Focal Point for the Global Taxonomy Initiative). The Environment and Natural Resources Management Department was the National Focal Point for the CBD until 2011; the change of focal point is mostly attributed to internal organization of work rather than to specific functions of the Climate Change and International Relations Department on biodiversity matters. Several other departments of the Ministry are involved in implementation of the CBD. The Protected Areas Management Department is the Focal Point for the Programme of Work on Protected Areas (PoWPA) and the Department of Botany of the National University of Mongolia is the Focal Point for the Global Strategy for Plant Conservation.

CBD COP meetings are mostly attended only by the National Focal Point. Occasionally delegations have been larger, namely, including representatives of NGOs.

The Focal Point consults with technical departments on the positions to take in view of negotiations and informs them on decisions taken at COP meetings.

### *Implementation*

Mongolia has been steadily increasing the scope of its protected areas. As of 2012, state special protected areas (SPAs) occupied over 27 million ha (17.4 per cent of the total territory). This had increased to 17.87 per cent by mid-2017, which already complies with Aichi Target 11 (by 2020, at least 17 per cent of

terrestrial and inland waters are conserved). In 2017, the state SPA system includes 20 strictly protected areas encompassing 12.4 million ha (7.93 per cent of the country's territory), 32 national parks encompassing 11.9 million ha (7.6 per cent), 36 nature reserves encompassing 3.5 million ha (2.26 per cent) and 14 natural monuments encompassing a total area of 128,962.78 ha (0.08 per cent).

Challenges persist regarding the effective and sustainable management of these protected areas, namely, those that are dependent on resources allocated by aimgovernment. Initiatives on co-management approaches, transferring the management rights to NGOs, entities and local communities, have been started on a contractual basis under certain conditions. Three protected areas are managed by NGOs (chapter 11). However, a proper legal framework for community-based management of SPAs is lacking (chapters 1 and 11). The 1994 Law on Protected Areas is currently being revised.

Aichi Target 15 is also of particular significance for Mongolia (by 2020, at least 15 per cent of degraded ecosystems are restored). According to the NBP 2015–2025, as of 2013, of the over 24,000 ha of land degraded by mining activities, 10,000 ha (41.65 per cent) have undergone technical restoration and over 6,000 ha (27.5 per cent) have been biologically restored.

WWF Mongolia is currently working on a mapping of watershed areas, which can be useful for aimgovernment in identifying areas where mining should be prohibited, which is relevant to preventing pollution caused by mining activities near river beds, which have impacts on local species.

### *Reporting and involvement in activities and mechanisms under the agreement*

Mongolia has submitted national reports to the CBD in 1998, 2003, 2006, 2009 and 2014. The reports are elaborated with the contribution of a broad range of stakeholders, such as line ministries, academic institutions and NGOs working in the field of biodiversity conservation. WWF Mongolia, in particular, has collaborated closely with the Ministry of Environment and Tourism, namely, on the elaboration of reports and strategic documents. Reporting obligations have been supported financially by GEF and UNEP.

Mongolia's main involvement with activities and mechanisms under the CBD mostly results from the adoption and implementation of National Biodiversity Strategies and Action Plans, such as the NBP 2015–

2025 and the regular submission of reports. Mongolia has not officially submitted any PoWPA Action Plan, in the framework of the PoWPA adopted by CBD parties in 2004. Mongolia has been quite active at the regional level on activities under the Biosafety Clearing House.

#### *Data and inventories to support implementation*

One of the goals of the NBP 2015–2025 is that biodiversity-related indicators are reflected in the national evaluation system to monitor the implementation of projects and programmes of relevant sectors.

Monitoring and the development and maintenance of reliable databases is also identified as one of the main needs in relation to species inventories, as information on species conservation is not updated regularly enough. Mongolia has an inventory of endemic species but information on alien species is very poor (chapter 11). The NBP 2015–2025 establishes as outputs the creation, by 2018, of a database for the registration of alien animal and plant species and, by 2020, improvement of the monitoring structure and legal environment for prevention of the spread of invasive species.

#### *International technical assistance*

Throughout the almost 25 years that Mongolia has been a party to the CBD, the country has benefited from multiple technical assistance projects and financial assistance from the main international organizations and donors operating under the CBD's scope of activities. The support of the international community has been essential for Mongolia to implement the CBD at the national level. Significant support has been provided for the elaboration of legal and strategic policy documents, institutional capacity and complying with reporting obligations. Multiple technical assistance projects have been implemented, actively involving and supporting the NGO sector active in the field.

Among currently ongoing projects, the following can be highlighted: BIOFIN, a UNDP project with the support of GIZ, supporting the development of the NBP Action Programme; the UNDP project on Mongolia's Network of Managed Resources Protected Areas; the ADB Technical Assistance Projects on Sustainable Tourism Development, on Sustainable Forest Management to Improve Livelihood of Local Communities and on Conservation of Forest Genetic Resources, with the support of the Government of Japan; and the GIZ project Biodiversity and

Adaptation of Key Forest Ecosystems to Climate Change II.

The project Mongolia's Network of Managed Resource Protected Areas is being implemented by the Ministry of Environment and Tourism with the financial support of GEF and UNDP, as well as through parallel activities of KfW, WWF and GIZ. The implementation period is from 2013 to 2018, with a total cost of US\$6,253,091. The project has made important contributions to the strengthening of the legal framework for local protected areas (LPAs). It helped to set up new, or, in some cases, to strengthen existing, LPA management structures in the three target LPAs. It helped develop long-term strategies, management plans and business plans for these areas. However, the project has also made evident concerns regarding the financial sustainability of all LPAs, taking into consideration difficulties in demonstrating the financial viability of the three target LPAs.

#### *Concrete benefits and challenges for the country*

Mongolia has more than 20 years' experience of strategic planning on biodiversity, which has resulted in a vast but somewhat dispersed set of legislation and policy documents relevant for the implementation of the Convention. The main benefits lie in the steady evolution of the designation of state SPAs, which currently represent 17.87 per cent of total land area, and the political commitment to continue further pursuing the goal of reaching 30 per cent of total land area by 2030, as well as improving the management capacity of the protected areas, namely, by implementing projects supporting local and community-based management. The main challenge is now their effective and sustainable management, in particular, their financing, improving the SPA network structure and conducting monitoring and inspections.

Positive trends are also noted in the increased number of known species in Mongolia. The country published IUCN Red List assessments and action plans for all vertebrate species known in Mongolia. However, databases on Mongolia's species are not reliable.

Overall, developing institutional, technical and financial capacity remains the main challenge for the implementation of the CBD. There is a certain institutional fragmentation among all entities involved in the implementation of the CBD; moreover, the National Focal Point is not directly involved in the implementation of the Convention, which is an exception compared with the other two Rio Conventions. There is strong collaboration with the

NGO sector in the biodiversity domain; however, efforts should be taken to ensure adequate institutional capacity exists inside the Ministry of Environment and Tourism.

In addition, persisting challenges affecting CBD implementation are associated with pressure on ecosystems and threats to the country's biodiversity related with cross-sectoral issues such as climate change, desertification, habitat degradation due to the change in livestock herd composition and unsustainable animal husbandry and agriculture practices, and pollution due to the growth of mining operations near river beds.

## 7.2 Cartagena Protocol on Biosafety to the Convention on Biological Diversity

Mongolia has been a party to the 2000 Cartagena Protocol on Biosafety since 2003 and ratified the 2010 Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress in 2013.

### *Legal, policy and institutional framework*

Mongolia adopted the 2007 Law on Living Modified Organisms, thereby establishing a national legal framework for biosafety. Its provisions include procedures for the registration and monitoring of LMOs and LMO products, risk assessment and transboundary movements of LMOs and border checkpoints. They also address LMO production, manufacturing and use. Provisions on managing LMOs and LMO products are also included in the 2012 Law on Food and 2012 Law on Ensuring the Safety of Food Products, in the National Security Concept, adopted by the State Great Khural in 2010 and in the NBP 2015–2025.

There is no specific action plan for biosafety. Prior to 2015, a draft national action plan for biosafety was developed but it was not adopted. When the NBP 2015–2025 was designed, its objectives 5 and 6 were developed so as to reflect the commitments relevant to the Cartagena Protocol. However these two objectives of the NBP 2015–2025 cannot substitute for a national action plan for biosafety.

**Photo 7.1: Grazing**



Mongolia also established a National Biosafety Committee, in 2008, and its mandate and composition was approved by the 2010 Ministerial Order No. A-27 and revised by the 2013 Ministerial Order No. A-03. It has the responsibility of overseeing activities related to biosafety and LMOs in the country and meets four times a year and as necessary. The Committee is headed by the Minister of Environment and Tourism, has a Secretariat providing technical support and is comprised of representatives of the ministries responsible for the environment, agriculture, health, foreign affairs and education and science issues, GASI, the General Intelligence Agency, NEMA, the National Centre for Communicable Diseases, National Centre for Zoonotic Diseases, National Centre for Public Health, Food Safety Council, scientific organizations and NGOs.

The Focal Point for the Cartagena Protocol is the Environment and Natural Resources Management Department, in the role of Secretariat of the National Biosafety Committee, who regularly attends COP-MOP meetings.

The necessary institutional framework for implementation of the Cartagena Protocol is in place, providing for collaboration among relevant institutions and with the academic and NGO sectors. Mongolia's legal framework is generally fit for implementation of the Cartagena Protocol; however, it requires revision in order to comply with the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress, as the country does not yet have the necessary administrative and legal instrument to provide a response to damage to biodiversity resulting from LMOs. The National Biosafety Committee is currently working on drafting legislation and intends to ask for international technical and financial assistance for the process.

### *Implementation*

Mongolia has progressed in implementing the Cartagena Protocol. Mongolia currently has four standards detailing methods of analysis for detecting LMOs. As of 2016, three entities had been given permission for usage in sealed environments.

Through the years, multiple training activities have been implemented to capacitate institutions and officers working in the field and on risk assessment, as well as awareness-raising for students and the general population, namely, through events broadcast on TV and other media. Guidelines for monitoring and

examining LMOs have been developed for inspectors, customs officers and laboratories.

Basic research on molecular biology and genetic engineering is being conducted. The molecular biology laboratory at the Mongolian Academy of Sciences General and Experimental Biology Institute has been determined to have the adequate technical and human resources for LMO detection and risk assessment. In 2012, its capacity for LMO detection was improved and the laboratory has been collaborating with the National Biosafety Committee.

Studies on labelling of LMO-derived food products have shown that international and national legislation is not being adequately implemented and activities and capacity in this field should be strengthened. The national report on the implementation of the Cartagena Protocol, elaborated in 2016 at the request of the National Biosafety Committee, includes proposed activities with that aim.

Mongolia has never received an application or notification regarding intentional transboundary movements of LMOs for intentional introduction into the environment and no cases have ever been identified of illegal transboundary movements of an LMO to or from Mongolian territory. Mongolia does not have any bilateral, regional or multilateral agreement with non-parties regarding transboundary movements of LMOs, neither has it ever imported or exported LMOs to a non-party.

Mongolia has been actively engaged in the implementation of the Cartagena Protocol and has produced significant work with very limited human resources (only two people work on biosafety in the Environment and Natural Resources Management Department). International funding has been essential for activities implemented and for compliance with the Cartagena Protocol.

Mongolia has implemented several projects for establishing and operationalizing its national biosafety framework and has received technical and financial assistance to comply with its international obligations.

In December 2016, the National Committee on Biosafety of Mongolia formally agreed to participate in the European Union Chemical Biological Radiological and Nuclear Centres of Excellence Initiative Project 53, which provides specialized training on biosafety and biosecurity in Central Asian countries.



*Reporting and involvement in activities and mechanisms under the agreement*

Since becoming a party to the Cartagena Protocol, Mongolia has submitted two regular national reports, in 2011 and 2015.

Mongolia has been engaged with regional initiatives in the framework of the Asia-Pacific Network on Public Awareness, Education and Participation Concerning Living Modified Organisms (Asia-Pacific Network on PAEP), which promotes the exchange of information and experiences on LMOs through regular workshops.

Mongolia has also been involved in the Asia BCH Family, a regional initiative established in 2016, aiming at capacity-building activities and the sharing of good practices through implementation of the 2016–2020 Roadmap focusing on four priority areas for the countries in the region (compliance with the National Biosafety Framework and Cartagena Protocol, regional networking, promotion of PAEP and building capacity towards effective participation to the Biosafety Clearing House). Mongolia will be the lead country of the Asian BCH Family for the period 2018–2020.

These initiatives are particularly relevant in a region where there is a growing tendency to use LMOs and where there is still a relative lack of adequate legal, institutional and management systems.

*Challenges for implementation*

Challenges persist in relation to capacity to perform risk assessments and monitoring regarding LMOs and LMO-derived products. There is no national database for the registration of LMOs and LMO-derived products. Human resources dealing with biosafety are also very limited and represent a major challenge for further advancing implementation.

Mongolia has never been placed under any compliance procedure by the Compliance Committee of the Cartagena Protocol.

**7.3 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity**

Mongolia became a party to the 2010 Nagoya Protocol rather recently – in 2014. The National Focal Point for the Nagoya Protocol is the Green Development Policy and Planning Department of the Ministry of Environment and Tourism. The Department is

coordinating the ongoing work on the legislation being prepared. Mongolia is yet to identify the Competent National Authority on Access and Benefit Sharing.

Provisions on the fair and equitable sharing of benefits arising out of the use of genetic resources were not included in the 1996 National Biodiversity Action Plan. In 2011, the working group established for drafting legislation on genetic resources concluded that, as public knowledge regarding the use and fair sharing of benefits arising from genetic resources was inadequate, genetic resources were not valued, and that an appropriate legal framework on utilization of genetic resources was lacking.

In the framework of the 2014 Green Development Policy, under strategic objective 2, "Preserve ecosystem balance through intensification of environmental protection and restoration activities and reducing environmental pollution and degradation", it is envisaged that the conditions for accessing resource benefits will be ensured through the registration and assessment of genetic funds and other relevant traditional knowledge bases and creation of the necessary regulatory framework for their use.

In order to comply with Aichi Target 16, Mongolia has established in its NBP 2015–2025 the goal to create a legal environment for the protection, sustainable use and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use and protection against genetic erosion and depletion. In order to reach this goal, three objectives have been set:

- Register and protect genetic funds of Mongolian livestock, cultivars and specimens of endemic and crop plants and their wild relative species;
- Register genetic resources and LMOs and create a genetic resource bank;
- Create a legal environment enabling the sustainable use and fair and equitable sharing of benefits arising from genetic resources.

According to the NBP 2015–2025, by 2017, a feasibility study for legislation on genetic resources should be conducted as well as a situation analysis on the legal framework. Mongolia expects to adopt legislation on the usage and sharing of benefits arising from genetic resources and related traditional knowledge by 2020. Also by 2020, methods of research and assessment techniques should be developed and rules and regulations on performing research on the genetic fund, collection and processing of traditional knowledge and manufacturing and sustainable use of products should be adopted. Mongolia also has the ambition, by 2025, to have

seeds of 100 per cent of endemic plants in the botanical garden, and the sperm and embryos of wild animals recorded and stored in a gene bank.

As of mid-2017, a draft framework law establishing obligations resulting from the Nagoya Protocol is being prepared. The work is being led by the Green Development Policy and Planning Department, which is coordinating the working group established for that purpose, comprising representatives of other departments of the Ministry of Environment and Tourism as well as from the Ministry of Food, Agriculture and Light Industry, GASI, the Agency of Intellectual Property, the General Intelligence Agency, academia and NGOs.

Mongolia has an interest in rapidly starting implementation of the Nagoya Protocol, in order to prevent the continuation of genetic resources leaving the country without control. However, in addition to requiring an adequate legal framework, the main challenges for implementing the Nagoya Protocol lie in the funding required, capacity development and the operationalization of an effective institutional framework. Scientific research and knowledge also remain challenging, as research on Mongolia's genetic resources is still in the early stages and there is no baseline data on genetic resources. Mongolia is one of the beneficiary countries of the UNDP/GEF project Strengthening Human Resources, Legal Frameworks and Institutional Capacities to Implement the Nagoya Protocol being implemented between 2016 and 2019.

#### *Sustainable Development Goals and targets relevant to this section*

The current stand of Mongolia vis-à-vis Target 15.6 is described in box 7.1.

#### **7.4 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa**

Mongolia ratified the 1994 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) in 1996.

#### *Legal, policy and institutional framework*

##### Legal framework

The most relevant legislation for compliance with the UNCCD includes the 2012 Law on Soil Protection and Desertification Prevention and the 2012 Law on Forests. The 2016 Law on Crop Production has provisions requiring tests on soil quality to be concluded every five years. Farmers are responsible for undertaking remediation measures if necessary. Farmers have access to fertilizers provided by the Government with facilitated paying conditions and do not pay custom taxes for fertilizers and pesticides. They are also provided with training on pesticide use and transport. The Law also aims at increasing the use of biofertilizers; however, no measure has been adopted to date in order to operationalize this provision.



#### **Box 7.1: Target 15.6 of the 2030 Agenda for Sustainable Development**

**Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

**Target 15.6: Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed**

At the global level, Target 15.6 is measured by Indicator 15.6.1: Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits.

Mongolia is currently preparing the legal framework for complying with its international obligations as a party to the Nagoya Protocol. Relevant provisions have also been included in the National Biodiversity Programme 2015–2025. The main challenge will be effective implementation and the creation of a capacitated and effective administrative structure, taking into account the complexity of procedures and the diversity of stakeholders who must be engaged. It will be important to monitor implementation and to assist Mongolia in capacity-development so that the national and local authorities and stakeholders, such as representatives of local communities, can effectively play their roles in the implementation of the Nagoya Protocol.

### Policy framework

As a party to the UNCCD, Mongolia developed its first National Plan of Action to Combat Desertification in 1996. Following the adoption of the 10-year strategic plan and framework to enhance the implementation of the Convention (2008–2018) (10-year Strategy), in 2007, Mongolia aligned its National Action Programme to the 10-year Strategy and, in 2010, adopted the National Action Programme to Combat Desertification for the period 2010–2020 (NAP) (2010 Government Resolution No. 90).

The NAP constitutes the main framework for the implementation of the UNCCD at the national level. Its main aim is to prevent, cope with and revert desertification and land degradation in Mongolia to ensure environmental sustainability, improve the livelihoods of the rural population and generate environmental services of global importance. It is complemented by subprogrammes at the aimag level, financed through the state budget, which define awareness-raising and training activities.

The NAP objectives and components are fully aligned with the strategic and operational objectives of the UNCCD's 10-year Strategy. The first implementation phase took place from 2010 to 2015. Measures undertaken during this period include actions on:

- Advocacy, awareness-raising and education, such as the inclusion of content related to desertification in schools curricula and commemoration of the World Day to Combat Desertification and Drought;
- The policy and legal framework (adoption of the 2012 Law on Soil Protection and Desertification Prevention, the development of harmonized methodology to determine soil degradation and desertification criteria, the development and implementation of subprogrammes for combating desertification at local level and mid-term plans in 14 aimags);
- Establishment of an initial monitoring network for desertification composed of 1,529 monitoring points;
- Science, technology and knowledge (organization of international scientific events, publication of the Desertification Atlas of Mongolia, survey and regular mapping to identify desertification trends, creation of electronic databases on soil, land and desertification);
- Capacity-building;
- Financing of concrete actions at local level (several tree-planting, reforestation and rehabilitation projects).

An assessment was conducted at the end of 2016, which concludes that the first phase of the programme had a 93 per cent implementation rate. Despite the activities undertaken, however, the overall assessment and data analysis from 2006 to 2015 shows that the total percentage of the territory affected by desertification has grown from 72 per cent in 2006 to 77.8 per cent in 2010, with a slight reduction to 76.8 per cent by 2015 (table 12.2). Integration of desertification, land degradation and drought (DLDD) into other sectoral policies is not sufficient.

Desertification is also addressed in the SDV 2030, which sets a target of decreasing the area of desertified land to 60 per cent in 2030, with a baseline of 78.2 per cent in 2014. Relevant sectoral objectives established under the SDV 2030 in the agricultural domain include ensuring appropriate numbers and flock structure in total livestock and developing intensive livestock farming and increasing its productivity. On farming, objectives include increasing the fertility of soil, reducing land deterioration, adopting economical and efficient advanced agrotechnical and irrigation technology to repair soil and developing intensified farming.

### Institutional framework

The National Focal Point for the UNCCD is in the Environment and Natural Resources Management Department of the Ministry of Environment and Tourism. The National Focal Point participates regularly in COP meetings and meetings of the Committee on Science and Technology under the UNCCD.

In the Ministry of Environment and Tourism, several departments work on DLDD and soil protection issues: the Environment and Natural Resources Management Department, Land Management and Water Policy Coordination Department, Forest Policy Coordination Department and Climate Change and International Relations Department.

The National Committee to Combat Desertification is identified under the NAP as the entity responsible for coordinating its implementation. The National Committee was established in 2000, with broad cross-sectoral and multi-stakeholder participation. Its mandate was reconfirmed by the 2012 Law on Soil Protection and Desertification Prevention as an intersectoral body responsible for overseeing coordination and cooperation of the sectors relevant in addressing desertification. However, an office within the National Committee was abolished in December 2015 in the framework of public administration restructuring (2015 Government Resolution No. 501),

and its functions were transferred to the Ministry of Environment, Green Development and Tourism. In July 2017, a steering committee was established by the Minister of Environment and Tourism (Order No. A/198 of 20 July 2017) to bring together various stakeholders (line ministries and academia) and assist the Ministry in coordinating the work on desertification and other issues.

Governors of aimags and soums have also been involved in the implementation of the NAP, and consequently of the UNCCD, through the development and implementation of subprogrammes for combating desertification that exist at the local level.

*Reporting and involvement in activities and mechanisms under the agreement*

Reports as an affected country party to the Convention have been presented in 2000, 2002, 2006, 2010, 2012 and 2014. The next report is due in 2018 (reporting in 2016 was optional).

Mongolia is active in regional activities under the Convention, the most significant one being the North East Asia Deforestation, Land Degradation and Drought Network (DLDD-NEAN), created in 2011, on the occasion of UNCCD COP 10. The platform brings together representatives of the Governments of Mongolia, the People's Republic of China and the Republic of Korea, as well as of academia, international organizations and civil society, providing for networking, capacity-building and exchange of good practices on combating DLDD and dust and sandstorms. The 2013 meeting of the Network was held in Ulaanbaatar.

In 2003, the Asia Regional Thematic Programme Network on Strengthening Capacities for Drought Impact Management and Desertification Control (TPN5) was launched in Ulaanbaatar. Mongolia was designated as its host country. The regional network aimed to reach out to stakeholders through the national level coordinating mechanisms and subregional programmes, as well as the regional framework of the TPN5.

The UNCCD National Focal Point also attends regional meetings under GEF and the UNCCD's Performance Review and Assessment of Implementation System (PRAIS). Mongolia organized the fourth Regional Meeting of UNCCD Focal Points in Asia in 2001.

In May 2017, Mongolia joined the Bonn Challenge, a global initiative aiming to restore 150 million ha of deforested and degraded land worldwide by 2020, and 350 million ha by 2030. The Bonn Challenge follows the forest landscape restoration approach and contributes to the integrated achievement of commitments taken in all three Rio Conventions, such as CBD Aichi Target 15 and the UNFCCC REDD+ goal. On the occasion of the Asian Bonn Challenge event, in May 2017, Mongolia made a pledge to restore 0.6 million ha of forest area by 2020, thus being one of the countries that has made possible the announcement of the 150 million ha pledge milestone. The Bonn Challenge provides an additional opportunity for the exchange of good practices on reforestation technologies and restoration planning among the countries in the region.

Being engaged with regional initiatives on DLDD has provided Mongolia with the possibility to strengthen capacity and share its knowledge with countries in the region.

*Data and inventories to support implementation*

One of the actions foreseen under the NAP is the establishment of a nationwide monitoring network for assessing DLDD trends in areas severely and very severely affected by desertification. Creation of the initial monitoring network has begun and it is currently composed of 1,529 monitoring points and two long-term monitoring points. The environmental database, available on [www.eic.mn](http://www.eic.mn), includes sections on desertification and land and soil, among others.

*International technical assistance*

Mongolia has received technical assistance for the implementation of the Convention, namely, training on PRAIS and assistance with the implementation of projects to combat desertification from ESCAP and UNDP. Mongolia has also benefited from the support of multiple donor countries. Many of the projects are targeted at herders and aim at supporting rangeland management and preventing desertification. The most relevant projects in this domain have been the Coping with Desertification Project supported by the Government of Switzerland, Sustainable Land Management for Combating Desertification Project supported by UNDP and the Government of the Netherlands, Green Belt Project supported by the Government of Republic of Korea and Green Gold Project supported by the Government of Switzerland.

**Photo 7.2: Unpaved road**

### *Concrete benefits and challenges for the country*

The main benefit for Mongolia from being a party to the UNCCD has been the implementation of its National Action Programme for Combating Desertification 2010–2020, which is aligned with the content of the 10-year Strategy of the UNCCD, therefore supporting the implementation of activities in all the strategic and operational objectives of the Strategy. Having an adequate strategic framework to tackle DLDD has also contributed to facilitating access to the multiple international organizations and donor countries that support the implementation of technical assistance projects. The establishment of a land degradation monitoring network is also partly a result of being a party to the UNCCD.

Considering that climate change is the main natural factor that causes desertification and land degradation, and that human activities of crucial importance to the Mongolian economy (such as those associated with animal husbandry, crop farming and mining) are responsible for the acceleration of desertification, sectoral coordination, implementation of integrated policies and awareness-raising are of crucial importance, in order to improve implementation of the Convention. The regular meetings and effective work

of the National Committee to Combat Desertification until the end of 2015 was essential for policy coordination; it is therefore regrettable that this body no longer exists. Mobilization of financial resources at the national and local levels also continues to be a challenge, as adequately addressing land degradation is one of the most serious environmental problems that Mongolia faces.

### **7.5 United Nations Framework Convention on Climate Change**

Mongolia has been a non-Annex I party to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) since 1993 and to the 1997 Kyoto Protocol since 1999. Mongolia has not yet ratified the Doha Amendment to the Kyoto Protocol. Mongolia ratified the Paris Agreement in September 2016.

#### *Current and foreseeable economic and environmental impacts from climate change*

Mongolia is vulnerable to the impacts of climate change, due to its geographical location as a landlocked country and meteorological characteristics, with high fluctuations and extreme temperature, annual mean temperatures ranging from -8°C to 6°C (the summer average being 10°C to 26°C

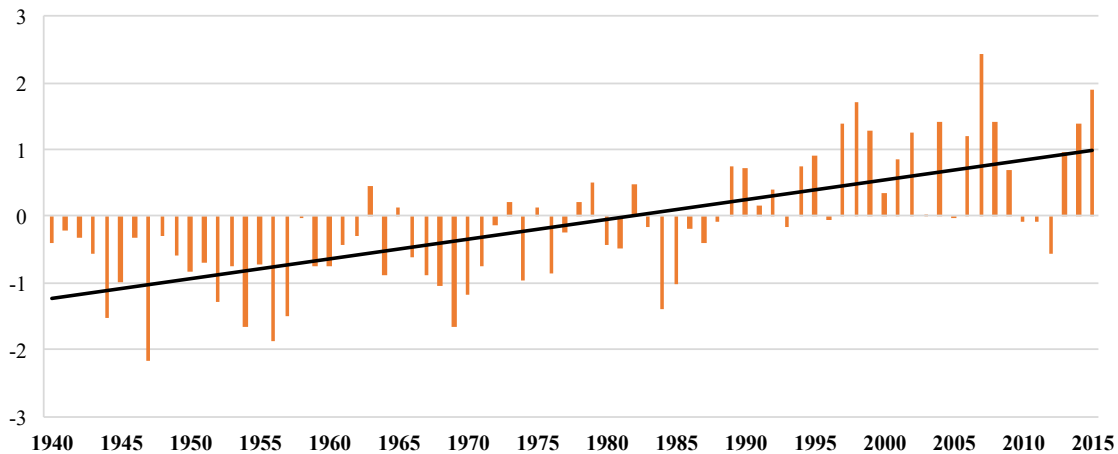
and winter average  $-15^{\circ}\text{C}$  to  $-30^{\circ}\text{C}$ ) and annual precipitation varying from 50 mm in the Gobi Desert to 400 mm to the northern mountainous area.

Climate change assessments conducted nationally in 2009 and 2014 have concluded that fragile ecosystems, the dependency on animal husbandry and rain-fed agriculture, and a growing population, traditionally nomadic and sparse but with a tendency towards urbanization, make Mongolia particularly vulnerable to climate change. Rural communities dependent on animal husbandry and crop farming are the most exposed to climate change impacts, such as melting of permafrost and glaciers, surface water shortages and soil and rangeland degradation; therefore, adaptation to climate change is particularly relevant for the country.

According to Mongolia's Second Assessment Report on Climate Change, published in 2014, records from 48 meteorological stations distributed across the country indicate an increase in the mean air temperature at the land surface by  $2.07^{\circ}\text{C}$  between 1940 and 2014. The temperature increased more intensively in the mountainous regions. The 10 warmest years of the last 74 years have all occurred since 1997 (figure 7.1).

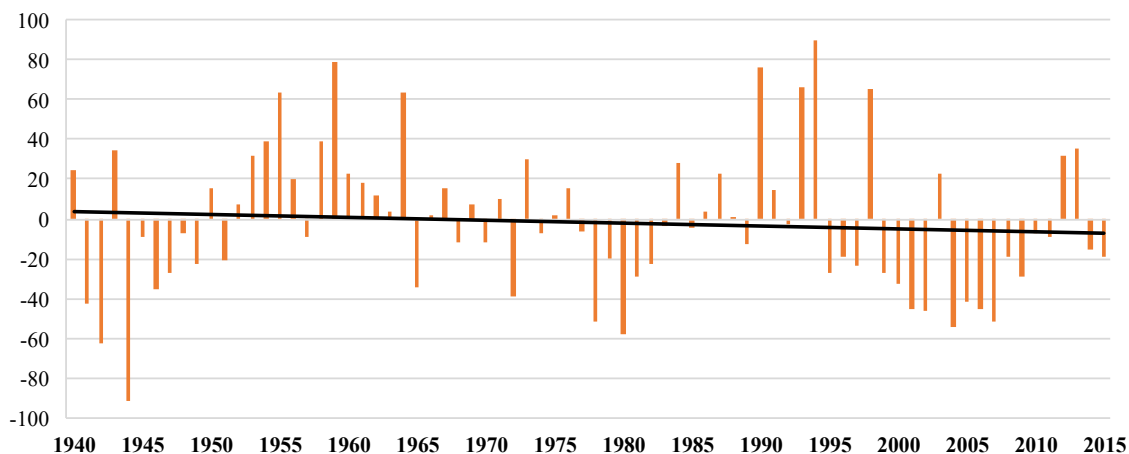
Precipitation has been decreasing at an annual rate of 0.1–2.0 mm per year for the majority of the country's territory (figure 7.2). The seasonal rainfall pattern has been changing; winter precipitation has gradually increased and summer precipitation has decreased slightly.

**Figure 7.1: Deviation from the multi-year average (1961–1990) of the annual mean temperature averaged over the territory of Mongolia and trendline, 1940–2015,  $^{\circ}\text{C}$**



Source: Mongolia Second Assessment Report on Climate Change, Ministry of Environment and Green Development, 2014.

**Figure 7.2: Deviation from the multi-year average (1961–1990) of the annual mean precipitation averaged over the territory of Mongolia and trendline, 1940–2015, mm**



Source: Mongolia Second Assessment Report on Climate Change, Ministry of Environment and Green Development, 2014.

Note: Average of 48 meteorological stations.

A declining aridity index has also been registered, which means that aridification has intensified. Scenarios used for Mongolia's 2015 Intended Nationally Determined Contribution (INDC) foresee temperature increases by 2.2°C between 2016 and 2035 and decreased precipitation. Climate projections show these tendencies will be aggravated in the medium term and that extreme events such as drought and dzud will become more frequent and more intense, with severe environmental, social and economic impacts.

The 2014 Second Assessment Report on Climate Change identified as the most vulnerable sectors animal husbandry, arable farming, human health, and natural resources such as water, forests, rangeland and soil. This thorough and detailed assessment is the basis of the summary of current and future climate change impacts, vulnerability and risk assessment presented under Mongolia's 2015 INDC (table 7.1).

No estimations of the costs of inaction have been conducted nationally, nor have they been included in the main policy framework documents.

#### *Greenhouse gas emissions per capita*

According to the World Bank, in 2013, Mongolia was in 19th position in the global ranking of CO<sub>2</sub> emissions per capita, with 13.50 t CO<sub>2</sub> emissions per capita (figure 7.3), which is more than the double the global average (4.90 t). In 2014, Mongolia ranked fifty-fourth and its CO<sub>2</sub> emissions per capita had decreased to 7.12 t.

#### *Greenhouse gas emissions by economic sector*

According to the 2017 GHG Emissions Inventory prepared by the Ministry of Environment and Tourism (table 7.2 and figure 7.4), Mongolian GHG emissions totalled 34,530.08 Gg CO<sub>2</sub> eq in 2014, representing an increase of 57.07 per cent since 1990 and 5.49 per cent compared with 2013. Between 2013 and 2014, with the exception of the energy sector (which registered a reduction in emissions of 2.78 per cent), all sectors registered a growth in emissions (Industrial Processes and Product Use by 37.74 per cent, Agriculture by 15.05 per cent and Waste by 6.25 per cent). The LULUCF sector is estimated as a sink that accounted for -24,451.93 Gg CO<sub>2</sub> eq of removals in 2014, an increase of 6.20 per cent since 1990.

The largest contributor to GHG emissions is the energy sector (50 per cent of total emissions in 2014)

(figure 7.5), with a large part coming from the energy industries subsector (55.87 per cent of emissions in the energy sector). Total emissions in the energy sector increased by 55.69 per cent between 1990 and 2014; however, a decline of 2.78 per cent has been registered compared with 2013. Emissions fluctuation in the energy sector has been associated with economic trends, energy supply structure and climate conditions, with the main factor influencing the increase in GHG emissions being energy demand and the country's high dependence on fossil fuels for electricity and heat generation.

Energy production is dominated by coal-fired CHP plants for electricity, domestic hot water and heating – which is fundamental in Mongolia due to the long and harsh winters. About 90 per cent of electricity is produced by CHPs. Currently, there are 13 HPPs in operation, with capacities varying from 150 kW to 12 MW. Electricity and heat are also supplied by diesel generators not connected to the central grid, independent solar PV systems, small solar–wind hybrid stations and heating stations.

Efficiency of energy use in the residential and services sector is low. Priority has been identified to improve energy efficiency and replace coal with clean energy sources.

The energy efficiency of buildings heated by central and district heating in Ulaanbaatar is also very low, with high heat consumption due to the technology used and lack of awareness. In aimag centres, small heating boilers are normally used in public buildings, with very low efficiency rates. Residential heating in peri-urban and rural areas is delivered through heat stoves, burning coal, wood and dry dung.

The agriculture sector is the second largest source of GHG emissions, accounting for 48.44 per cent of GHG emissions in 2014. A continuous increase in agricultural production has resulted in the increase in emissions by 58.02 per cent between 1990 and 2014, or by 15.05 per cent when compared to 2013.

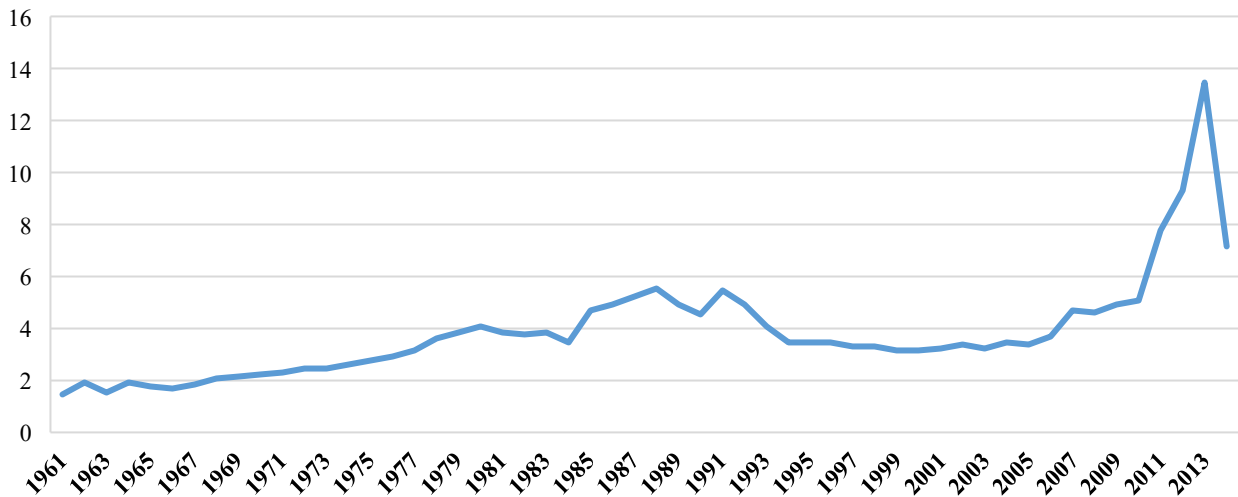
The industrial processes and product use (IPPU) sector constituted 0.95 per cent of emissions in 2014, with a 50.03 per cent increase since 1990. IPPU emissions are growing at the highest rate of all sectors (31.73 per cent) when compared with 2013, in large part due to the mineral industry (cement and lime production), which represented 68.86 per cent of IPPU sector emissions in 2014, associated with increased demand by the construction industry.

**Table 7.1: Summary of current and future climate change impacts**

Sector	Current impacts	Future impacts, vulnerability and risk assessment
Pasture and soils	Pasture production has decreased by 20–30 per cent in the past 40 years based on pasture observation data; About 70 per cent of pasture has changed in certain aspects; Pasture plants composition has changed, ecosystem zones have shifted and plants tolerant to droughts have become dominant; Soil fertility and quality has degraded.	Results from the “Century” ecosystem model showed that for aboveground biomass, net primary production and pasture biomass would decrease by 10–40 per cent from current levels in natural zones; Soil organic carbon is estimated to be reduced by 6.3–9.5 per cent by the 2050s in the forest steppe and the steppe regions.
Forest ecosystems	Area covered by forests has decreased by 4.1 per cent in the period 1999–2012; Frequency of forest fires has increased and area burnt by forest fire has expanded by 13.3 per cent in 1999–2012; Recurrent drought and dry spells affect negatively the forest biomass accumulation and biomass annual growth tends to be slower; Forest insects and pests tend to spread to more areas.	In 2050, area affected by harmful forest insects will expand to 1.4–13 times higher than current level; Forest fire will cover 512,000 ha more in 2030 without any measure being taken against fires; Areas of the high mountains and the forest steppe will decrease by 70–80 per cent and 8–41 per cent respectively; Permafrost will continue to melt and forest strip borders in the high mountains will shift towards the mountaintops.
Water resources, glaciers, permafrost	Surface water regime is changing, lake areas are decreasing, small lakes, springs and even some rivers are drying up; Negative mass balance and shrinkage of glaciers occur and total glacier area has reduced by 27.8 per cent in last 70 years; Ice thickness of rivers draining from glaciers has increased by 40 cm and consequently duration of ice cover period has increased by 10–20 days and its water temperature decreased; Duration of ice cover period and ice thickness have decreased by 20 days and by 35 cm respectively in the rest of rivers draining from other than glacier areas; Water temperature has increased by 2°C; Groundwater table is tending to decrease.	The average water temperature in the period April to October will increase by 3.1–4.2°C by 2080; River run-off will increase by 8–13 mm in 2080, while potential evaporation will increase by several times; The annual glacier melt rate or glacier mass balance will increase by 67 per cent compared with melt rate in the period 1982–2010; Temperatures in the ground at depths of 10 m and 15 m have been increasing in the northern permafrost region.
Natural disasters	Frequency of disasters in the last two decades were compared: annually, about 75 disaster phenomena were observed in the previous 10 years and the number has doubled in the last decade; Rapid onset phenomena, such as heavy rain, flash flooding, strong wind, thunderstorms and hail, have been more frequent and intense and economic loss due to disasters has doubled; Frequencies of drought and dzud are increasing and the biggest dzud occurred in the winters of 2002–2003 and 2009–2010, when GDP decreased by at least 6 per cent; About 77.8 per cent of the total land area has experienced degradation and desertification to a certain extent.	Frequency of atmospheric hazardous phenomena will increase by 23–60 per cent from current levels by 2050; Livestock loss due to drought and dzud is expected to increase by 9.4 per cent by 2050, which is about 2.1 per cent more than the average rate of loss from 1981 to 2000; Land degradation and desertification would lead to increased evapotranspiration and decreased rainfall as a result of reverse feedback mechanism.
Animal husbandary	Current level of animal loss is about 2 per cent and this rate has increased by 0.25% per year in the period 1991–2011; The average animal weight has decreased; Pasture production has reduced and number of hot days which make grazing difficult for livestock have increased; Dates for goat cashmere and sheep wool shearing have advanced by 5–10 days; In recent years, 26 new diseases, eight reoccurring and six extending diseases of animals have been recorded in the country.	Animal losses caused by drought and dzud will increase and have been estimated at 8.2 per cent and 9.4 per cent in 2020 and 2050 respectively; Snow in winter is predicted to increase by 40–50 per cent and heavy snow will cause negative impact on grazing and decreased animal weight; Due to animal weight loss, total meat production is expected to decrease by 5.4 per cent in the 2050s; Pasture water supplies will be challenging because of decreased small lakes and water ponds caused by intensified dryness.
Arable farming	Hot spells (above 26°C) inhibit photosynthesis process in crops and reduce production; Dryness process has been intensified in the arable farming region in the last 70 years. Productive moisture in 1 m layer of soil has reduced by about 30 per cent; Although cumulative heat has been sufficient, moisture has become lacking for crop growth and development.	Results of the crop production model of the Decision Support System for Agrotechnology Transfer 4.0 demonstrated that wheat production per ha is estimated to decrease by 13 per cent in the 2030s.
Human health	Cardiovascular disease has increased in the last 31 years; Cardiovascular disease cases in Ulaanbaatar City have increased while the number of hot days above 30°C has increased; Number of the population affected by natural disasters tends to increase.	Cases of cardiovascular disease will continue to increase due to hot spells and heatwaves; Vector-borne infectious diseases will increase.
Infrastructure	Frequency of extreme events and their magnitude has increased significantly in the last 20 years.	Increased heavy rainfall and floods will cause damage to roads, buildings, bridges and construction, reducing their useful lifespan; Electricity transmission cables and systems can be broken by heavy snow and ice freezes; Flood protection canals, HPP construction and normal working regime can be damaged by water regime changes.

Source: Mongolia INDC, 2015.



Figure 7.3: CO<sub>2</sub> emissions per capita, 1960–2014, t

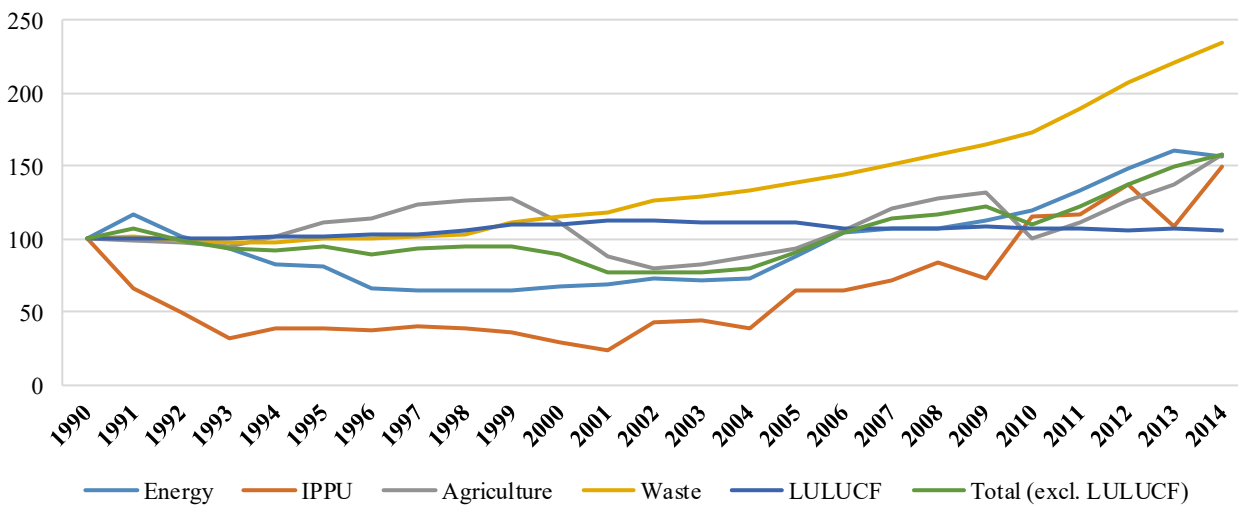
Source: World Bank, 2017.

Table 7.2: GHG emissions by sector, 1990, 2013, 2014, Gg CO<sub>2</sub> eq

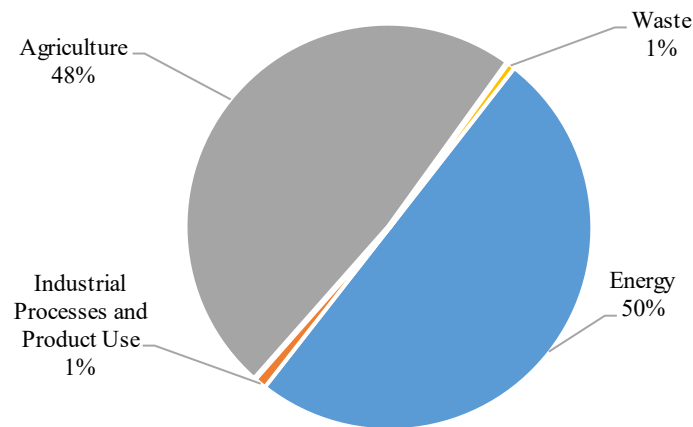
Sector	1990	2013	2014	Change 1990 - 2014 (%)
Energy	11 091.14	17 762.10	17 267.79	55.69
IPPU	218.66	238.20	328.06	50.03
Agriculture	10 585.30	14 538.80	16 726.98	58.02
Waste	88.40	195.10	207.26	134.44
<b>Total (excluding LULUCF)</b>	<b>21 983.51</b>	<b>-24 547.70</b>	<b>34 530.08</b>	<b>57.07</b>
LULUCF	-23 024.18	8 186.60	-24 451.93	6.20
<b>Net total (including LULUCF)</b>	<b>-1 040.67</b>	<b>32 734.20</b>	<b>10 078.15</b>	<b>-1 067.85</b>

Source: Greenhouse Gas Emissions Inventory, Ministry of Environment and Tourism, 2017.

Figure 7.4: Aggregated GHG emissions and removals by sector, 1990–2014, 1990=100



Source: Greenhouse Gas Emissions Inventory, Ministry of Environment and Tourism, 2017.

**Figure 7.5: GHG emissions by sector, 2014**

Source: Greenhouse Gas Emissions Inventory, Ministry of Environment and Tourism, 2017.

Although representing only 0.34 per cent of GHG emissions in 2014, the waste sector has registered progressive increases, being the fastest growing emission source since 1990 (134.44 per cent), increasing by 6.25 per cent when compared with 2013, due to the economic growth and population increase in urban areas that have been registered in recent decades.

In the 2017 GHG Emissions Inventory, the LULUCF sector is presented as a net CO<sub>2</sub> sink, being responsible for 24,451.93 Gg CO<sub>2</sub> eq removals in 2014, an increase of 6.20 per cent between 1990 and 2014, although a decrease of 0.39 per cent of removals has been registered when compared with 2013.

Emission trends by gas in the 2017 GHG Emissions Inventory (table 7.3) show that, in 2014, 46.46 per cent of GHG emissions were from CO<sub>2</sub>. There has been an increase of 56 per cent in CO<sub>2</sub> emissions between 1990 and 2014, mostly due to the increase in emissions from the energy sector (81.92 per cent). Fossil fuel combustion is the main source of CO<sub>2</sub> emissions in Mongolia, followed by the manufacturing industries and construction sectors. The CO<sub>2</sub> emissions of these two sectors have, however, declined by 8.65 per cent between 1990 and 2004.

Methane (CH<sub>4</sub>) is the second highest emitted gas, representing 32.89 per cent of emissions in 2014, originating in particular from the agriculture and livestock sector and solid waste disposal in landfills. In the period 1990–2014, methane emissions increased by 64.93 per cent.

Agricultural activities are also the main ones responsible for nitrous oxide (N<sub>2</sub>O) emissions, representing 20.42 per cent of those emissions in 2014, an increase of 69.63 per cent when compared with 1990. Data on hydrofluorocarbons (HFCs) are only available from 2012 onwards, indicating only 0.28 per cent of total emissions in 2014.

Indirect GHG emissions have significantly decreased since 1990, in the case of nitrogen oxides (NO<sub>x</sub>) by 97.75 per cent and carbon monoxide by 97.58 per cent (table 7.4).

According to estimations from 2013, GHG emissions are expected to increase gradually due to the growth of energy consumption and demand by several sectors. Projections indicate that GHG emissions will increase above 2006 levels by a factor of 2.1 by 2020 and 3.2 by 2030. While emissions from the energy, agriculture and waste sectors are expected to increase, removals from LULUCF are expected to decrease by a factor of three.

#### *Legal framework*

The legal framework relevant for implementation of the UNFCCC is composed of multiple laws, including the 2001 Law on Energy, 2007 Law on Renewable Energy amended in 2015, 2015 Law on Energy Efficiency (also known as the Law on Energy Conservation) and 2012 Law on Air.

**Table 7.3: Total direct GHG emissions by gas, 1990, 2014, Gg CO<sub>2</sub> eq**

Direct GHG emissions	Change from 1990		
	1990	2014	(%)
CO <sub>2</sub>	10 927.61	16 004.13	46.46
CH <sub>4</sub>	6 872.62	11 341.60	65.03
N <sub>2</sub> O	4 150.49	7 040.58	69.63
HFCs	..	96.43	..
<b>Total</b>	<b>21 950.72</b>	<b>34 482.74</b>	<b>57.09</b>

Source: Greenhouse Gas Emissions Inventory, Ministry of Environment and Tourism, 2017.

**Table 7.4: Total indirect GHG emissions by gas, 1990, 2014, Gg CO<sub>2</sub> eq**

Indirect GHG emissions	Change from 1990		
	1990	2014	(%)
NO <sub>x</sub>	1.78	0.04	-97.75
CO	63.63	1.54	-97.58

Source: Greenhouse Gas Emissions Inventory, Ministry of Environment and Tourism, 2017.

In September 2014, the President of Mongolia approved the Presidential Decree No. 121 on Climate Change, aiming to intensify the implementation of the National Action Programme on Climate Change (NAPCC) and other climate-change-related policies. The Decree addresses adaptation measures, promotion of clean technologies, efficient use of natural resources, renewable energy, participation in international negotiations, access to international financing and awareness-raising. It also determines that financial resources must be allocated annually by the state budget for implementation of the Decree.

In August 2010, the Government held a special meeting at the Gobi Desert and adopted a declaration highlighting the impacts of climate change in Mongolia, specifically on the acceleration of desertification, the occurrence of extreme events and their impacts in the Mongolian traditional livelihoods. Through the declaration, the Government called for the adoption of a decision of the UNFCCC COP to take into account the specific circumstances of developing countries that are landlocked, vulnerable and affected by rapid desertification, and request developed countries to establish a flexible mechanism enabling developing countries to introduce climate-friendly technologies and to take appropriate response measures for climate change adaptation and GHG emissions reduction. UNFCCC COP 16 in Cancun later decided on the establishment of the Green Climate Fund and adopted the Cancun Adaptation Framework.

### *Policy framework*

#### National Action Programme on Climate Change

The first NAPCC was approved by the State Great Khural in 2000 and later substantially revised in 2011, for the period 2011–2021 (2011 Resolution of the State Great Khural No. 2). The first phase implementation plan (2011 Government Resolution No. 317) envisages measures for the period 2011–2016.

The NAPCC currently constitutes the main policy framework for implementing the UNFCCC in Mongolia and has three strategic objectives:

- Set a legal environment, structure, institutional and management system responding to climate change issues;
- Ensure environmental sustainability and reduce socioeconomic vulnerabilities and risks through strengthening the national climate change adaptive capacity;
- Mitigate GHG emissions and establish a low-carbon economy through the introduction of environmentally friendly technologies and improvement in energy effectiveness and efficiency.

The NAPCC includes measures on both mitigation and adaptation in key sectors of the Mongolian

economy. The first implementation phase took place between 2011 and 2016. According to the plan, in this first phase, legal and institutional frameworks would be set up and capacity-building would be strengthened. In the second phase (2017–2021), adaption and mitigation activities would be undertaken.

An assessment has been conducted for the first implementation phase. Measures taken under this first phase include: the climate change response action plan being implemented at aimag level and several aimags having local action plans on climate change; development and approval of the National Action Plan for Disaster Risk Reduction; 2015 amendments to the Law on Energy and the Law on Renewable Energy; development of the Ecosystem-based Adaptation Action Plan for Disaster Risk Reduction in the River Basins; activities aimed at enhancing reforestation and forest rehabilitation; conducting a forest inventory; and preparation of Mongolia's Second Assessment Report on Climate Change.

As of mid-2017, the second phase implementation plan is being prepared and consideration is being given to how to align it with the most recent developments, namely the 2015 INDC.

#### Nationally Determined Contribution

Mongolia submitted its Intended Nationally Determined Contribution (INDC) on 24 September 2015, which, with the ratification of the Paris Agreement by Mongolia on 21 September 2016, became Mongolia's first Nationally Determined Contribution (NDC). It includes both a mitigation commitment and an adaptation component. Its elaboration was coordinated by the Special Envoy for Climate Change, with the support of the Climate Change Project Implementing Unit of the then Nature Conservation Fund under the then Ministry of Environment, Green Development and Tourism, with financial and technical support from GEF, UNEP and GIZ. An ad hoc working group was established for its elaboration, convening representatives of the most relevant line ministries, at technical level. In addition to technical work, the NDC document was discussed at the Council of Ministers, which involved consultation with civil society representatives.

According to its NDC, by 2030, Mongolia intends to contribute to global efforts to mitigate GHG emissions by implementing the policies and measures described in table 7.5, in the energy, industry, agriculture and transport sectors, contingent upon the continuation of international support to complement domestic efforts.

The NDC also indicates Mongolia's interest in pursuing additional mitigation actions in the energy, transport, agriculture, waste, industry and forestry sectors.

The cumulative impact of the measures identified is estimated to result in an annual reduction in emissions of approximately 7,300 t CO<sub>2</sub>eq in 2030, corresponding to a 14 per cent reduction compared with a business-as-usual (BAU) scenario, excluding LULUCF (table 7.6).

Emission data estimations presented in the NDC were based on projected emissions for 2010, presented in the Second National Communication. The potential of agricultural emission reduction measures could not be estimated, due to the lack of available background information, and were not accounted for in the NDC estimations.

Considering the relevance of adaptation to climate change for Mongolia, the NDC also comprises an adaptation component. It establishes as a vision increasing adaptive capacity to overcome negative impacts of climate change and to strengthen resilience of the ecosystem and socioeconomic sectors. Adaptation targets are identified as well as funding, capacity and technologies needed.

According to the NDC estimation, the implementation of the foreseen adaptation policies in the agriculture, forestry and water resources sectors would increase the capacity of carbon sinks of natural ecosystems to absorb almost half of the emissions from the energy sector in Mongolia (table 7.7).

Preliminary investment needs estimations for implementing the measures and meeting the targets set under the mitigation component of the NDC accounted for US\$3.5 billion. For the adaptation measures and technology and capacity-building needs identified, the estimation is of US\$3.4 billion. Mongolia intends to finance it primarily through international sources and donor institutions, such as the Green Climate Fund, and by participating in crediting mechanisms, also expecting substantial funding from private sources, leveraged by public funding, from the state budget as well as government special funds. Although Mongolia has a good track record of accessing international financial and technical assistance mechanisms, no efforts are made at present to diminish the high dependency on international funding and to increase the share of funding from the national budget.

**Table 7.5: Mitigation measures under the Nationally Determined Contribution**

Sector	Measure	Specific measures	Investment needs (US\$ million)	Policy document
Energy (power and heat)	Increase renewable power capacity from 7.62 per cent in 2014 to 20 per cent by 2020 and to 30 per cent by 2030 as a share of total power generation capacity	Installation of 675 MW capacity large hydropower facilities	1 350	2015 State Energy Sector Policy 2014 Green Development Policy
		Installation of 354 MW wind power facilities	584	
		Installation of 145 MW solar PV power facilities	573	
	Reduce electricity transmission losses from 13.7 per cent in 2014 to 10.8 per cent by 2020 and to 7.8 per cent by 2030			
	Reduce building heat loss by 20 per cent by 2020 and by 40 per cent by 2030, compared with 2014 levels	Improve insulation for existing panel apartment buildings of 18 184 households in Ulaanbaatar	90	
	Reduce internal energy use of CHP plants (improve plant efficiency) from 14.4 per cent in 2014 to 11.2 per cent by 2020 and by 9.4 per cent by 2030	Improve efficiency of coal-fired plants	900	
	Implement advanced technology in energy production such as super critical pressure coal combustion technology by 2030			
Energy (transport)	Improve national paved road network; upgrade/pave 8 000 km by 2016 and 11 000 km by 2021			2011 National Action Programme on Climate Change (NAPCC)
	Improve Ulaanbaatar City road network to decrease all traffic by 30–40 per cent by 2023			2015 Urban Public Transport Investment Programme
	Increase the share of private hybrid road vehicles from approximately 6.5 per cent in 2014 to approximately 13 per cent by 2030			2010 Nationally Appropriate Mitigation Actions (NAMAs) 2010 Mid-term New Development Programme
	Shift from liquid fuel to LPG for vehicles in Ulaanbaatar and aimag (province) centres by improving taxation and environmental fee system			
	Improve enforcement mechanism of standards for road vehicles and non-road based transport			
Industry	Reduce emissions in the cement industry through upgrading the processing technology from wet to dry processing and through the construction of a new cement plant with dry processing up to 2030			2010 NAMAs 2011 NAPCC Building Materials Programme (2012 Government Resolution No. 171)
Agriculture	Maintain livestock population at appropriate levels according to the pasture carrying capacity			2010 National Mongolian Livestock Programme

Source: Mongolia INDC, 2015.

**Table 7.6: GHG emissions reduction compared to BAU, 1,000 t CO<sub>2</sub> eq**

Sector	2015	2020	2025	2030
Energy (power and heat)	0.04	1.15	2.59	4.88
Energy–Transport	0	0.297	0.97	1.76
Industry				0.7
<b>Total</b>				<b>7.34</b>

Source: Mongolia INDC, 2015.

**Table 7.7: Adaptation targets and needs under the Nationally Determined Contribution**

Sector	Adaptation goals	Adaptation targets	Capacity needs	Technology needs	Financial needs (US\$ million)
Animal husbandry and pastures	To implement sustainable pasture management.	Reduce rate of pasture degradation; Regulate headcounts and type of animals, including wild animals, to match with pasture carrying capacities.	To create regulations for pasture use; To set up taxation system for pasture use; To increase community participation in proper use of pasture, their monitoring and conservation.	To build an early warning system for drought and dzuds to prevent animal loss; To improve livestock quality and breeds; To improve livestock health (epidemic and infectious diseases) management.	46
Arable farming	To increase cropland, reduce soil water loss and decrease soil carbon emissions.	To reduce bare fallow to 30 per cent; To introduce crop rotation system with 3–4 routes and 3–5 crops; To expand irrigation cropland by 2–2.5 times.	To create regulations on soil protection (soil texture, nutrient and moisture).	To diffuse zero-tillage technology; To increase variety of crops and rotation; To introduce effective drip irrigation technology, reducing water use by 2.5–5 times.	150
Water resources	To maintain the availability of water resources through protection of run-off formation zones and their native ecosystem in river basins.	30 per cent of the territory will be protected as national SPAs by 2030 and the sustainable financial mechanism will be introduced.	To implement integrated water resource management systems; To coordinate multi-stakeholder relations through improved legal and policy measures and efficient management; To strengthen human resource capacity to deal with technical issues.	To implement ecosystem-based technologies; To support ecosystem services through hydrological monitoring, construction of water diversion canals to drying lakes located in flood plains and re-forestation actions.	5
	To construct reservoirs for glacier melt water harvesting; To regulate river streams and flow.	To create water reservoirs at rivers and at outlets of lakes, and to construct multipurpose systems of water usage.	To enhance hydrological monitoring and research for river flow regulation; To construct water reservoirs and water diversion facilities to transfer water resource to dry regions.		1 800
	To introduce water saving and water treatment technologies.	To find solutions for sustainable water supply of Ulaanbaatar City and industries and mining in the Gobi region, and subsequently implement.	To conduct a study and introduce sustainable water supply with closed systems preventing evaporation loss.	To introduce new technologies for water saving, and treatment.	605
Forest resources	To increase the efficiency of reforestation actions.	Forest area will be increased to 9 per cent by 2030 through reforestation activities.	To build the capacity of community forestry groups to conduct modern technologies for forest seedlings and tree plantations.	To introduce technology to plant seedlings.	11
	To reduce forest degradation rate.	To reduce forest degradation rate caused by human activities, fires, insects and diseases.	To set up fully equipped stations fighting forest fires and insects outbreaks and capacity-building.	To use aircraft to fight fires; To introduce biological technologies against insects and pests.	13
	To improve the effectiveness of forest management.	Resilient forests that are adapted to climate change, highly productive and have appropriate composition and structure will be created.	To provide equipment and machinery to carry out forest cleaning activities; To train human resources for forest management practices.	To improve the efficiency of forest cleaning technologies.	7
Natural disaster management	To enhance early warning and prevention systems for natural disasters.	To strengthen early warning system for natural disasters.	To establish early detection and prediction system, To conduct disaster risk assessment at the local level.	To improve forecasting quality through increasing supercomputer capacity; To establish Doppler radar network covering the entire territory of the country.	65.4

Source: Mongolia INDC, 2015.

Mongolia's NDC is based on a "policies and measures" approach, which was considered to be the most appropriate, due to limited data availability in some sectors, uncertain development of national circumstances, the risk entailed by specific quantified targets and the potential for ambitious action through the policies and measures foreseen. With the submitted NDC, the Government aimed to present a contribution considered to be feasible, based on political commitments included under the 2014 Green Development Policy, which would contribute to climate targets by mainstreaming climate action into other sector policies. A more ambitious target for GHG emission reductions was considered initially, but a more prudent approach was chosen, due to the uncertainty at the time of elaboration of the INDC of the results of the international negotiations. The decision taken on the level of ambition is not consensual among stakeholders that took part in the elaboration of the INDC, with some expressing their conviction that it may possibly be increased and others expressing doubts about the country's capability to meet the 14 per cent GHG emissions reduction target.

The NDC foresees monitoring to be conducted through an integrated process of assessment of targets set along the way. So far, an integrated monitoring mechanism or structure for the NDC has not been established. An implementation roadmap is being prepared, and its articulation in the second implementation phase of the NAPCC is being considered. As the measures foreseen are included in legislation or development strategies and sectoral plans that already existed prior to the NDC, the responsibility for their implementation is according to the institutional arrangements of each sector responsible for the relevant policy. Although this is positive in terms of requiring the involvement of the other line ministries, it would still be important to establish an integrated procedure to monitor the NDC implementation, due to its transversal nature and also considering that line ministries do not have a focal point for climate issues. This is even more relevant considering the provisions on reporting obligations and regular revision of targets established under the Paris Agreement. In June 2017, a project concept proposal requesting support in this domain was adopted by the GEF, making Mongolia one of the first countries to appeal to the Capacity-building Initiative for Transparency (CBIT) established under the Paris Agreement.

#### Other policy documents

Coping with climate change is one of the three sectors contemplated under SDV 2030. Within this

framework, the Government establishes objectives dealing with both mitigation and adaptation. Using 2010 baseline data, Mongolia aims to reduce GHG emissions by 2 per cent by 2020, by 7 per cent by 2025 and by 14 per cent by 2030. This target is in line with the expected mitigation impact of the policies and measures included in Mongolia's NDC. By 2020, Mongolia also plans to develop and implement a strategy to cope with climate change, strengthen disaster risk management capacity, improve its environmental observation capacity, establish early detection and early warning systems of natural hazards and possible disasters, and educate citizens on coping with climate change. By 2025, measures include implementation of pilot projects to cope with climate change, implementation of best practice projects and organization of national-level activities on disaster risk and vulnerability reduction on a regular basis. By 2030, the NDC aims at reduction of the impacts of climate change and land deterioration and loss from disasters.

Although adaptation components have been included in the main strategic documents on climate change, no strategy or national adaptation plan have been approved to date. In 2014, the Ministry of Environment and Green Development, together with the ADB, published "Making Grasslands Sustainable in Mongolia: Adapting to Climate and Environmental Change". It identifies potential adaptation strategies and practices in the local context.

#### *Sustainable Development Goals and targets relevant to this section*

The current stand of Mongolia vis-à-vis Targets 13.2 and 13.3 is described in box 7.2.

#### *Institutional framework*

##### Special Envoy for Climate Change

Since 2008, Mongolia has had Special Envoys for Climate Change, appointed by the Prime Minister. The current Special Envoy assumes the functions of National Focal Point for the UNFCCC and for the Green Climate Fund.

##### Climate change responsibilities at central level

NAMEM was responsible for climate change matters and implementation of the UNFCCC until the period 2008–2010. In particular, it was responsible for inventories and studies conducted.



### Box 7.2: Targets 13.2 and 13.3 of the 2030 Agenda for Sustainable Development

#### **Goal 13: Take urgent action to combat climate change and its impacts**

#### **Target 13.2: Integrate climate change measures into national policies, strategies and planning**

Major strategic documents such as 2016 Mongolia Sustainable Development Vision 2030 and the 2014 Green Development Policy include climate change measures and are the framework for mainstreaming climate change in sectoral policies. The National Action Programme on Climate Change (NAPCC) and Mongolia's Nationally Determined Contribution (NDC) also follow that approach. The Biennial Update Report (BUR) submitted in August 2017 allows for assessment of the effectiveness of the measures undertaken. Mongolia has yet to prepare a national adaptation plan, which will be crucial for complying with Target 13.2.

#### **Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning**

The NAPCC foresees under its first phase (2011–2016) including climate change, sustainable development and green economy development subjects in the curricula of schools of all levels. Curricula are being updated and teachers have received training on climate change, under a GIZ project.

The target can also be reached through implementation of the SDV 2030 goal of implementing capacity-building on climate change adaptation, and strengthening the natural disaster risk prevention framework. Likewise, the NAPCC establishes as a strategic goal expanding the climate change monitoring network; renewing technology; enhancing research, measurement, and evaluation actions; and capacity-building. The Ministry of Environment and Tourism also intends to organize awareness-raising sessions at aimag level.

In 2011, the NAPCC designated the National Climate Committee as the responsible authority in the Government for climate-change-related issues and for implementation of the Action Programme. The National Climate Committee, led by the then Minister of Nature, Environment and Tourism, was responsible for managing climate-change-related activities, coordinating sectoral integration, evaluation of projects and programme implementation and providing supervision of and guidelines to stakeholders. The Committee was abolished in the framework of a restructuring of public administration in December 2015 and its responsibilities were transferred to the Ministry of Environment, Green Development and Tourism. Therefore, Mongolia currently does not have any formal and stable structure specifically designated to coordinate the implementation of climate policy.

The National Climate Committee was supported by the Climate Change Coordination Office, established by Ministerial Order No. A-23 in February 2011 (revised by Ministerial Order No. A-11 in January 2013), which was abolished in January 2015. Its staff was partially transferred to the newly created Climate Change Project Implementation Unit (CCPIU) of the Environment and Climate Change Fund (established by Ministerial Order A/118 of February 2015) and partially integrated into the Climate Change and International Relations Department of the Ministry of Environment and Tourism.

The CCPIU of the Environment and Climate Change Fund is currently the only entity in Mongolia responsible for climate change issues, both domestically and internationally. The CCPIU is responsible for supporting the Special Envoy for Climate Change.

The Green Development Policy and Planning Department of the Ministry of Environment and Tourism is responsible for overall coordination, policy formulation for climate change mitigation and adaptation and providing policy guidance as part of green development policy.

The Climate Change and International Relations Department of the Ministry of Environment and Tourism is also involved with implementation of the UNFCCC, taking part in COP meetings and being actively engaged in the coordination of cooperation and the development of technical assistance projects.

#### Participation in UNFCCC meetings

National delegations to COP meetings regularly include the UNFCCC National Focal Point and an officer of the Climate Change and International Relations Department. Occasionally, delegations have had a larger composition and have included other representatives of the Government, local governments and the private sector. Meetings of subsidiary bodies are only attended by the National Focal Point. Mongolia has been a member of the UNFCCC



Adaptation Committee, representing non-Annex I parties, from 2012 to 2017. It is represented by the former Special Envoy for Climate Change, serving in a personal capacity.

There is no formal and regular procedure for the preparation of the country's position before international negotiations, namely, for involving stakeholders and civil society representatives. The Ministry of Foreign Affairs is generally informed about international climate negotiations, but it does not have a designated officer for climate issues; rather, it is involved in consultation with other ministries, which take place on an ad hoc basis, whenever an issue requires it. Mongolia is a member of the G77 group and participates at regional coordination meetings held back to back with COP meetings.

#### Environment and Climate Change Fund

At the end of 2016, the Environment and Climate Change Fund was established by Ministerial Order reforming the then Environmental Protection Fund. The Fund aims to raise resources nationally and internationally for projects on climate change, nature and conservation and public awareness. In the period 2014–2016, most resources were allocated to EE (40.8 per cent) and water management (31.1 per cent), followed by protection of rare and endangered species (12.7 per cent) and combating desertification (5.9 per cent) (table 3.14). No resources were spent on climate change measures as such.

#### *Implementation and compliance*

Mongolia has never been subject to a compliance procedure under the UNFCCC. Mongolia has not yet ratified the Doha Amendment establishing the second commitment period of the Kyoto Protocol and establishing new commitments for Annex I parties to the Kyoto Protocol. As a non-Annex I party, by accepting the Doha Amendment, Mongolia would express its support for the implementation of the Protocol.

#### Adaptation efforts

The 2015 NDC includes examples of measures currently taken for adaptation to climate change. Most of these examples present regular activities to improve environmental monitoring, data collection and natural resource management.

#### Mitigation

The 2015 NDC includes the target to reach, by 2030, 14 per cent reduction of GHG emissions, but the

implementation of the measures foreseen is not yet decided. The second implementation phase of the NAPCC is being prepared in light of the commitments presented under the NDC. It is expected that mitigation measures will be included in the second phase. Progress achieved in renewable energy development is shown in box 7.3.

#### *Reporting and involvement in activities and mechanisms under the agreement*

##### Reporting

Mongolia submitted its Initial National Communication to the UNFCCC in 2001 and Second National Communication in 2010. As of mid-2017, the Third National Communication is being prepared with the support of the GEF and UNEP. As a non-Annex I party, Mongolia is obliged to present Biennial Update Reports (BURs). The initial BUR was submitted in August 2017, past the deadline of December 2014.

The delay in submission is explained by difficulties in obtaining financial resources and institutional uncertainty following the election of a new Government in 2016. The Ministry of Environment and Tourism received financial assistance from the GEF and was supported by UNEP and UNDP's Global Support Programme for National Communications and Biennial Update Reports. Elaboration of the BUR and Third National Communication are the responsibility of the CCPIU. A Project Steering Committee has been established, led by the State Secretary of the Ministry of Environment and Tourism. It integrates representatives of several departments of the Ministry of Environment and Tourism as well as of the ministries responsible for mining, energy and finance, Ulaanbaatar City authority and the focal points of the CBD and UNCCD. The WWF is also represented in the Project Steering Committee.

##### Nationally Appropriate Mitigation Actions

In January 2010, Mongolia submitted a list of 22 proposed Nationally Appropriate Mitigation Actions of Developing Country Parties (NAMAs) to the UNFCCC, as expression of its commitment to the Copenhagen Accord and efforts towards reduction of GHG emissions. The list of NAMAs focused on energy, industry, buildings, transport, agriculture and forestry. The measures listed under the NDC are generally in line with the NAMAs, especially those on transport and industry.

### Box 7.3: Potential and progress of renewable energy development

Strategic documents such as the 2016 Mongolia Sustainable Development Vision 2030, the 2005 National Renewable Energy Programme 2005–2020, the 2015 State Energy Sector Policy 2015–2030, the 2014 Green Development Policy and the 2015 NDC have all established and reiterate the political commitment of Mongolia to increasing the share of renewable energy in the consumption of total energy to 20 per cent by 2020, to 25 per cent by 2025 and to 30 per cent by 2030.

The 2015 State Energy Sector Policy indicates that Mongolia had 7.62 per cent of renewables in installed power-generation capacity in 2014. Reaching by 2030 the 14 per cent reduction in GHG emissions that Mongolia has set under its NDC is highly dependent on the implementation of the measures foreseen to increase the capacity of renewable energy sources for electricity generation.

According to Mongolia's National Renewable Energy Centre, Mongolia's renewable energy potential is estimated at 2.6 TW. Combined electricity produced from wind and solar sources in Mongolia could reach 15,000 terawatt-hours (TWh) per year. Therefore, Mongolia has a renewable energy potential much larger than is required by its domestic consumption. In 2016, the IRENA Renewables Readiness Assessment concluded that the development of renewables – which would be a strategic move for the country – and reaching the renewables targets and developing Mongolia into a clean energy producer and exporter would be possible but challenging. To unlock that potential, Mongolia would have to remove market and development barriers, in order to provide benefits for the country and the region.

The Government has adopted or revised a set of relevant instruments in the energy domain, such as the 2001 Law on Energy, the 2007 Law on Renewable Energy revised in 2015, the 2015 State Energy Sector Policy and the 2015 Law on Energy Efficiency (also known as the Law on Energy Conservation). The revised legislation aims to strengthen public–private partnerships and to create a market-oriented energy framework.

In July 2013, the 52 MW Salkhit wind farm became operational, representing a milestone as Mongolia's first utility-scale non-hydro renewable energy facility. In January 2017, the 10 MW Sergelen solar power plant started operations. Another wind farm in Sainshand is expected to start operating during 2017, supplying 52 MW of electricity generation capacity. The 15 MW Tsetsii wind farm is also under construction in the Gobi area. There are several other projects in the pipeline in varying stages of development.

Feasibility studies and EIA have been conducted for the 315 MW capacity Egiin HPP on the Eg River. The Government has been replying to requests from the UNESCO World Heritage Committee over its concerns on the transboundary environmental impacts of the project, as well as requests regarding the Shuren HPP on the Selenge River and the Orkhon River project (chapter 6).

#### Green Climate Fund

Mongolia has been actively engaging with the Green Climate Fund (GCF), the financial mechanism established under the UNFCCC that has been given an increased role by the Paris Agreement in supporting the efforts of developing countries to address climate change. Mongolia designated the CCPIU as the Focal Point and National Designated Authority for the GCF and took part in the GCF's first regional workshop for Asian countries, in 2015, to discuss readiness and national priorities in relation to the Fund. The identification of priority sectors has been very broad: under mitigation, energy (power and heat), industry, transport, waste, LULUCF and urban air pollution have been identified as priorities; on adaptation, water, agriculture, disaster risk reduction and forests have been identified as priorities.

In 2016, Mongolia was granted national direct access to the GCF, through the accreditation of XacBank LLC for small projects of medium risk. Two additional private sector institutions have opened Online Accreditation Systems (OAS) accounts, increasing direct access options. Multiple contacts

have been ongoing between the National Focal Point, the accredited direct access entity and GCF representatives.

Mongolia has presented three requests to the GCF Project Preparatory Support programme. Two projects have been approved by the GCF as of mid-2017.

UNDP is supporting Mongolia in preparing a funding proposal to the GCF for Improving Adaptive Capacity and Risk Management of Rural Communities. The project will aim at strengthening the adaptive capacity and resilience of the agriculture sector to climate change. Several other proposals to the GCF are also in the project preparation pipeline and under review.

#### Clean Development Mechanism

As of mid-2017, Mongolia has four registered projects under the CDM of the Kyoto Protocol (table 7.8). Additional CDM projects are at validation stage and a number of other CDM project are in preparation.

### Joint Crediting Mechanism

In 2013, the Governments of Mongolia and Japan signed the Low Carbon Development Partnership, a bilateral agreement launching the Joint Crediting Mechanism (JCM), the first partnership established by Japan with this purpose. JCM projects aim to promote advanced low-carbon technologies and products, which produce non-tradable credits that can be used as part of Japan and Mongolian mitigation efforts, in accordance with the UNFCCC and the Paris Agreement. A Joint Committee was established, on the Mongolian side with representatives of the relevant ministries, the ERC and the Office of the Governor of Ulaanbaatar City. The CCPIU assumes the functions of the Secretariat of the Joint Committee on the Mongolian side. As of June 2017, Mongolia has two registered projects under the JCM, and two approved methodologies and six projects are in the pipeline (table 7.9).

### United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD Programme)

In June 2011, Mongolia became the first country with significant boreal forest cover to become a partner in the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD Programme) and started implementing activities to ensure REDD+ readiness. A Readiness Roadmap was elaborated in 2014.

In 2015, the UN-REDD Mongolia National Programme was approved for the period 2016–2018, with the support of UNDP, aiming to support the Government in designing and implementing its National REDD+ Strategy and in meeting the

requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based payments. The UN-REDD Mongolia National Programme is supporting the development of a national forest monitoring system, comprising a monitoring function and a measurement, reporting and verification function. In this context, between 2014 and 2016, GIZ supported the preparation of a REDD+ compatible forest inventory (chapter 13), aiming to provide reliable information on forest developments under the impact of climate change. The REDD+ National Strategy is currently being prepared, in coordination with the most recent strategic national policy documents, and is expected to include an action plan and investment plan.

### NDC Partnership

Mongolia is a partner of the NDC Partnership, a global initiative launched at COP 22 to help countries achieve their national climate commitments and ensure efficient financial and technical assistance.

### Technology Needs Assessment project

Mongolia was one of 14 countries that participated in UNEP's Technology Needs Assessment project. In 2013, the Ministry of Environment and Tourism, with the support of the GEF and UNEP and in collaboration with the Regional Centre of the Asian Institute of Technology, elaborated a comprehensive Technology Needs Assessment Report addressing both mitigation and adaptation. On mitigation, the energy industries and the residential and commercial subsectors were considered the priorities, for their contribution to and reduction potential of GHG emissions. On adaptation, priority sectors identified were arable farming and animal husbandry, as sectors that will be most vulnerable to climate change and that represent an essential role in the economy of the country.

**Table 7.8: Clean Development Mechanism projects**

<b>Title</b>	<b>Year of registration</b>	<b>Host parties</b>	<b>Sector</b>	<b>Expected emission reductions (tCO<sub>2</sub>/year)</b>
Retrofit programme for decentralized heating stations in Mongolia	2006	Mongolia	Energy Efficiency Improvement	11 904
Taishir Hydropower Project in Mongolia	2007	Mongolia, Japan	Renewable Energy	29 600
Durgun Hydropower Project in Mongolia	2007	Mongolia, Japan	Renewable Energy	30 400
Salkhit Wind Farm	2012	Mongolia, Sweden	Renewable Energy	178 778

Source: Ministry of Environment and Tourism; United Nations Framework Convention on Climate Change (<http://cdm.unfccc.int>).

**Table 7.9: Joint Crediting Mechanism projects**

Project Title	Type	Registration/ approval date	Expected emission reductions (tCO <sub>2</sub> )
Installation of High-efficiency Heat-only Boilers in 118th School of Ulaanbaatar City	Registered project	30-Jun-15	92 tCO <sub>2</sub> /year (2015–2020)
Centralization of Heat Supply System by Installation of High-efficiency Heat-only Boilers in Bornuur Soum	Registered project	30-Jun-15	206 tCO <sub>2</sub> /year (2015–2020)
Installation of Energy-saving Transmission Lines in the Mongolian Grid	Approved methodology	20-Feb-14	
Replacement and Installation of High-efficiency Heat-only Boiler (HOB) for Hot Water Supply Systems	Approved methodology	28-Jan-15	
Energy Conservation at Cement Plant at Darkhan-Uul Aimag	Feasibility study		78 000 tCO <sub>2</sub> /yr
10 MW-scale Solar Power Generation for Stable Power Supply in Gobi-Altai province, Taishir Soum	Feasibility study		17 537 tCO <sub>2</sub> /yr
Improvement of Thermal Insulation and Water Cleaning/Air Purge at Power Plant at Ulaanbaatar	Feasibility study		3 000 tCO <sub>2</sub> /yr
Efficiency Improvement of Combined Heat and Power Plant by Thermal Insulation at Ulaanbaatar	Feasibility study		1 723 tCO <sub>2</sub> /year (CHP-3& CHP-4)
Distributed Heat Supply System Using Biomass and Coal Mixture Combustion Type Boiler at Ulaanbaatar	Feasibility study		3 760 tCO <sub>2</sub> /year

Source: Joint Crediting Mechanism (<http://www.jcm-mongolia.com>).

#### *Data and inventories*

Mongolia prepared two extensive assessment reports on climate change, the first in 2009 and the second in 2014. It has conducted GHG inventories with the two National Communications submitted in 2001 and 2010.

An updated GHG Inventory was concluded by mid-2017, including data on LULUCF, under the responsibility of the CCPIU and with the support of the GEF and UNEP. It is presented as an annex to the initial BUR. Most of the emissions factors used were not country specific but were default ones.

#### *International technical assistance*

Mongolia has benefited extensively from technical assistance in the climate change domain from the most relevant international organizations and donor countries. Mongolia is one of the first countries to appeal to the Capacity-building Initiative for Transparency (CBIT) established under the Paris Agreement. The funding proposal submitted to the GCF in September 2016, Building Capacity to Advance National Adaptation Plan Process in

Mongolia, is also particularly relevant to assist the country in elaborating its national adaptation plan.

#### *Concrete benefits and challenges for the country*

Mongolia has completed a comprehensive and thorough strategic planning and needs assessment on climate change, which is a direct benefit of being a party to the UNFCCC. Thanks to the reporting and the technical assistance provided, Mongolia today has time series of up to 25 years of climate-relevant data. However, some challenges persist in terms of data availability and GHG inventory.

Mongolia has also benefited extensively from the technical and financial support of the international community, namely, through mechanisms such as the CDM, JCM and GCF.

Challenges remain, in particular with regard to the institutional framework, which has suffered from a certain degree of instability. Currently, there is neither a stable technical/expert structure nor a policy coordination body for climate issues. This poses an additional challenge for policy coordination and

monitoring, which will become increasingly important in the coming years.

## 7.6 Synergies between implementation of Rio Conventions

Promotion of synergies between the three Rio Conventions is done mostly through informal contacts between the National Focal points of each Convention.

The three main strategic programmes that guide implementation of the Conventions at the national level all have multiple references that directly or indirectly contribute to more than one of the Conventions' scope of activities.

Although there is not a formal coordination structure, all three National Focal Points take part in coordination mechanisms, such as the Project Steering Committee that has been established to prepare for the BUR to be submitted to the UNFCCC. The three National Focal Points are also part of the JCM Committee.

## 7.7 Assessment, conclusions and recommendations

### *Assessment*

Being a party to the Rio Conventions has directly influenced environmental policy in Mongolia for the last almost 25 years. The country has adopted national programmes in all three domains, aligned with the provisions of these Conventions, which represent the main policy implementation frameworks for implementation. The benefits of being a party to the Rio Conventions can also be seen beyond environmental policymaking. The challenges associated with biodiversity, desertification and climate change, and commitments taken in the international context, have been included in cross-cutting national development framework strategies, such as the recent SDV 2030.

Institutional, technical and financial capacities remain the main challenges for the implementation of the Rio Conventions, although to different degrees. Having adequate strategic frameworks has undoubtedly contributed to gaining access to technical and financial support from the international community, but much more needs to be done in all three domains covered by the Rio Conventions. The institutional framework has suffered from instability, with the National Committee to Combat Desertification and the National Climate Committee – both essential for policy coordination – abolished in December 2015.

## *Conclusions and recommendations*

### Convention on Biological Diversity

Mongolia has undertaken efforts to implement the CBD. The National Biodiversity Programme 2015–2025 is currently the main policy framework, complemented by a vast and somewhat dispersed set of legislation and policy documents relevant for its implementation. Overall, institutional, technical and financial capacity remains the main challenge for the implementation of the CBD. In addition, persistent challenges affecting implementation are associated with pressure on ecosystem services and threats to the country's biodiversity, related with cross-sectoral issues. There is strong collaboration with the NGO sector in the biodiversity domain.

#### Recommendation 7.1:

*The Ministry of Environment and Tourism should continue to pursue implementation of the National Biodiversity Programme, with a view to complying with the CBD and to reach the Aichi Biodiversity Targets, ensuring an effective coordination mechanism among all those relevant for the implementation of the CBD.*

### Cartagena and Nagoya Protocols

The legal and institutional framework for implementation of the Cartagena Protocol on Biosafety is generally adequate, although legislation is in need of revision in order to comply with the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress, and financial and human resources are very limited.

Mongolia has not yet identified the Competent National Authority on Access and Benefit-sharing under the Nagoya Protocol. The Ministry of Environment and Tourism is currently coordinating the work on the legal provisions necessary to implement the Nagoya Protocol, in a process involving several ministries and stakeholders. In addition to an adequate legal framework, Mongolia has not yet established an effective coordination structure, involving local communities. Creating the legal and institutional framework to ensure fair and equitable sharing of benefits is of the utmost importance if Mongolia is to achieve Target 15.6 of the 2030 Agenda for Sustainable Development (Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed). The issues of financial resources and capacity-development for

implementation of the Nagoya Protocol are highly pertinent.

Recommendation 7.2:

*The Government should:*

- (a) *Revise legislation on biosafety, in order to provide a response to damage to biodiversity resulting from LMOs and comply with the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol;*
- (b) *Adopt legislation necessary for the implementation of the Nagoya Protocol;*
- (c) *Designate a Competent National Authority on Access and Benefit-sharing under the Nagoya Protocol, establishing an effective coordination mechanism among the different institutions that will be involved in the implementation of the Protocol.*

UNCCD

In relation to the UNCCD, the National Action Programme to Combat Desertification 2010–2020 is aligned with the Convention's 10-year Strategy and activities have been taken under all the operational and strategic objectives of the Strategy. The fact that its strategic policy documents are aligned with the main international references on the issue, has facilitated the country's access to technical and financial support to address desertification. However, the dimension of the problem still requires additional efforts as, according to the latest assessments, in 2015, 76.8 per cent of the total area of Mongolia was affected by desertification and land degradation.

Recommendation 7.3:

*The Ministry of Environment and Tourism should:*

- (a) *Continue using the 10-year Strategy of the UNCCD as the guiding reference for the second implementation phase of the National Action Programme to Combat Desertification and further promote the mainstreaming of desertification, land degradation and drought into sectoral policies;*
- (b) *Endeavour to actively engage in ongoing negotiations on the future Strategic Framework of the Convention for the period post-2018, in order to prepare for the necessary future policy planning adjustments;*
- (c) *Continue its engagement with activities under the UNCCD, namely, at the regional level, sharing its experience and exploring possible partnerships with international organizations*

*and other countries that can facilitate access to additional technical and financial assistance.*

UNFCCC

The Government has undertaken efforts to develop and implement policies that can contribute to adaptation to the impacts of climate change and is aware of the importance of reducing GHG emissions. The National Action Programme for Climate Change 2011–2021 is an adequate policy framework; however, a national adaptation plan is yet to be adopted. Preparation of such a plan is an important element for achievement of SDG Target 13.2 (Integrate climate change measures into national policies, strategies and planning).

Mongolia was one of the frontrunners in ratifying the Paris Agreement. As described in the 2015 NDC, the country intends to mitigate GHG emissions by implementing measures in the energy, industry, agriculture and transport sectors, contingent upon the continuation of international support to complement domestic efforts. Measures are estimated to result in an annual reduction of 7,300 t CO<sub>2</sub> eq of emissions in 2030, corresponding to a 14 per cent reduction compared with a business-as-usual (BAU) scenario, excluding LULUCF.

The main challenges for the implementation of the policies and measures that will allow Mongolia to comply with its mitigation target and adapt the most vulnerable sectors to the impacts of climate change are having the necessary financial resources and an effective and sufficiently capacitated institutional framework. Mongolia has benefited extensively from the technical and financial support of the international community and has been able to successfully access mechanisms such as the CDM, JCM and GCF. The second implementation phase of the National Action Programme for Climate Change is currently being prepared, in light of the commitments presented under the 2015 NDC.

A domain so dependent on policy coordination as climate change requires effective institutional coordination mechanisms, which Mongolia currently does not have. Capacity and know-how on GHG emissions monitoring require strengthening. Efforts to improve human and institutional capacity on climate change would assist Mongolia in implementing SDG Target 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning).

Recommendation 7.4:

The Government should:

- (a) *Adopt a national adaptation plan and the Second Phase Implementation Plan of the National Action Programme for Climate Change, aligning them both with the most recent strategies and commitments taken internationally on climate change, namely, the Nationally Determined Contribution;*
- (b) *Establish a body specifically dedicated to coordination among line ministries relevant to climate policy, supported by a technical, permanent and sufficiently capacitated structure;*
- (c) *Take actions to reduce dependency on international financial resources, guaranteeing the conditions necessary to promote private investment and ensuring the sustainability of capacity-building activities.*

Synergies in implementation

There is no specific mechanism or structure to promote synergies in the implementation of the Rio Conventions. Nevertheless, the main policy frameworks in the three domains directly or indirectly contribute to the coordinated implementation of the three Conventions.

Recommendation 7.5:

*The Ministry of Environment and Tourism should continue taking into account the linkages among the Rio Conventions and reflect them in the legal and policy implementation framework of each Convention.*

***PART III***  
***INTEGRATION OF ENVIRONMENT INTO SELECTED***  
***SECTORS/ISSUES***





## Chapter 8

# AIR PROTECTION

### 8.1 Urban and rural air quality

Although air quality in Mongolia has been monitored for the last 30 years, due to the inconsistency of measurements, limited number of monitored parameters and limited availability of data, the longest time series that can be analysed covers the period 2008–2016 for two pollutants, SO<sub>2</sub> and NO<sub>2</sub>, which were constantly monitored in that period at 10 sampling sites.

All SO<sub>2</sub> average annual concentrations based on the 24-hour mean recorded during the observed period in various stations were below 20 µg, which represents the highest 24-hour mean recommended by WHO Air Quality Guidelines and the national annual limit value (figure 8.1). NO<sub>2</sub> concentrations are almost under the annual limit value of 40 µg/m<sup>3</sup> as set by the Mongolian national standard (MNS 4585:2007) and recommended by WHO Air Quality Guidelines, except for those recorded at Erdenet (figure 8.2).

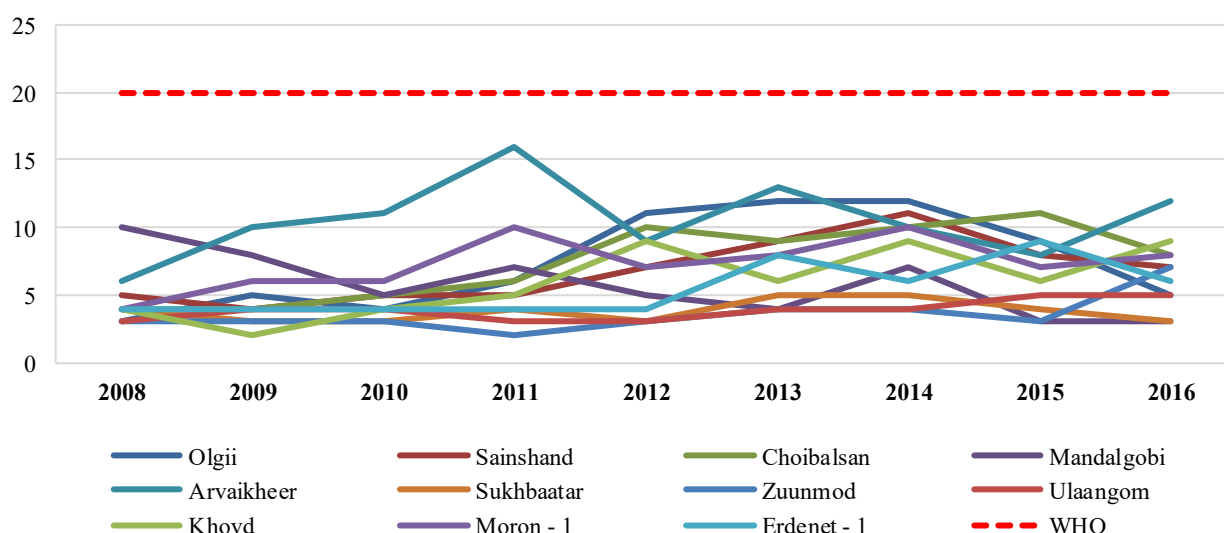
Erdenet is the third largest city in Mongolia, known for having the largest copper mine in the world.

Combustion and traffic could both represent significant sources of NO<sub>2</sub>. It would be expected that concentrations of SO<sub>2</sub> are also high in Erdenet, since the mining industry uses sulphuric acid in the extraction and treatment of copper, though available data do not show high concentration of SO<sub>2</sub>.

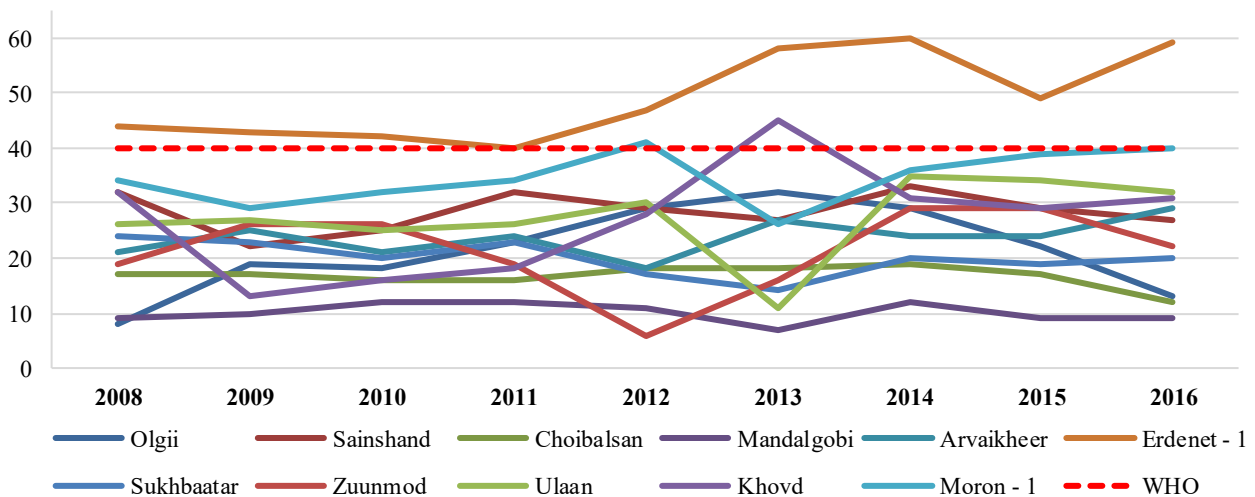
Exceedances of limit values of both SO<sub>2</sub> and NO<sub>2</sub> were also noted in Ulaanbaatar (figure 8.3), with the highest annual mean value of 168 µg/m<sup>3</sup> of NO<sub>2</sub> recorded in 2013 at automatic measurement station UB-02 (traffic station).

Regular monitoring of acid deposition within the Acid Deposition Monitoring Network in East Asia (EANET) started in 2001. In Mongolia, it is monitored at two sites, one in Ulaanbaatar and the other in Terelj. The 2015 EANET annual report shows that the annual average pH of precipitation at both sites does not show signs of acidity of precipitation as a result of emissions of SO<sub>2</sub> and NO<sub>x</sub> in air (table 8.1). Monitoring covered only anions and cations contents, such as Ca<sup>2+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Na<sup>+</sup>, NH<sup>4+</sup>, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup>, using filter packs.

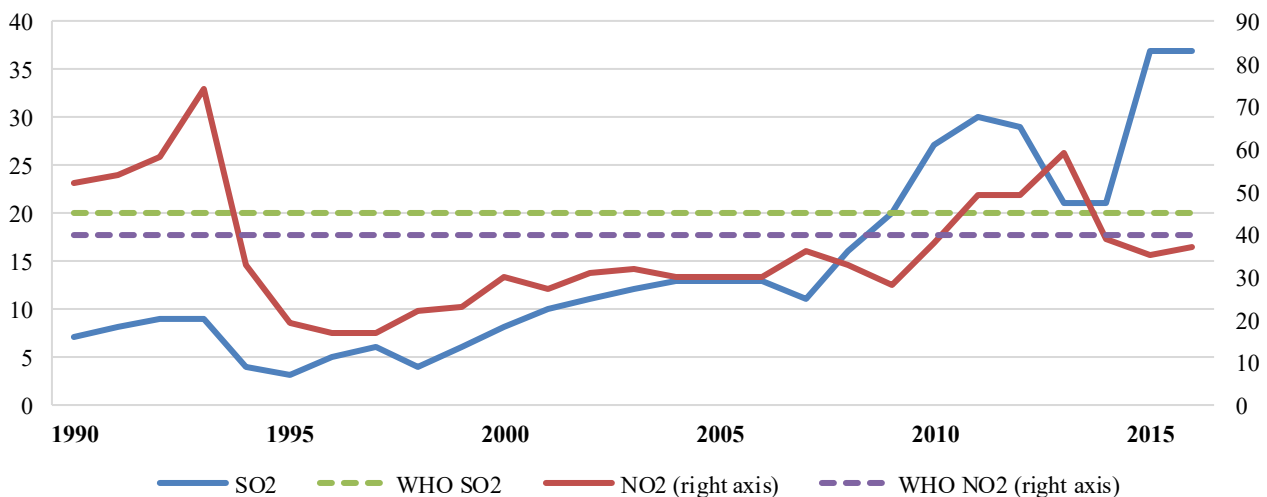
**Figure 8.1: Average annual concentrations of SO<sub>2</sub> in selected cities, 2008–2016, µg/m<sup>3</sup>**



Source: Environmental Statistics, EP-8.1 form/Air quality status reports (<http://www.eic.mn>).

**Figure 8.2: Average annual concentrations of NO<sub>2</sub> in selected cities, 2008–2016, µg/m<sup>3</sup>**

Source: Environmental Statistics, EP-8.1 form/Air quality status reports (<http://www.eic.mn>).

**Figure 8.3: Average annual concentrations of SO<sub>2</sub> and NO<sub>2</sub> in Ulaanbaatar, 1990–2016, µg/m<sup>3</sup>**

Source: Ministry of Environment and Tourism, 2017.

**Table 8.1: Precipitation amount-weighted annual average pH, 2001–2015**

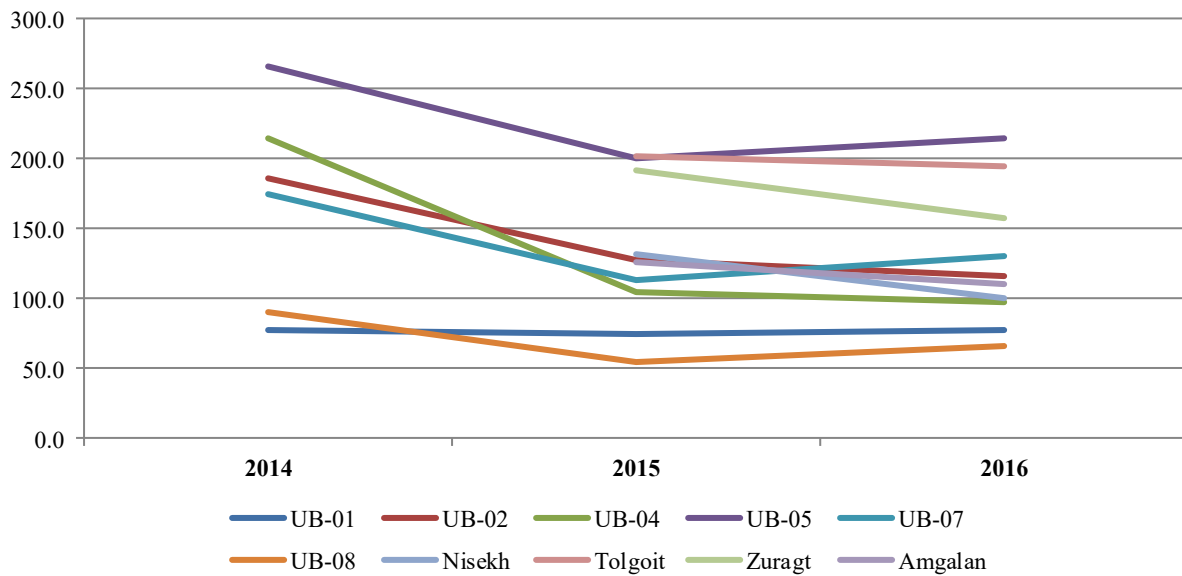
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ulaanbaatar	6.19	6.38	5.72	6.46	5.99	6.45	6.26	6.28	6.11	5.88	5.44	5.88	5.98	..	6.42
Terej	6.04	5.75	5.4	5.78	5.26	5.16	5.22	5.43	6.22	5.61	5.26	5.74	4.91	..	5.5

Source: Data Report on the Acid Deposition in the East Asian Region, Acid Deposition Monitoring Network in East Asia, 2015.

Note: For 2014, data are not available.

Data on concentrations of suspended particles, which are considered the main air pollution issue in Mongolia, and especially in Ulaanbaatar, are available only as of 2009. However, in the period 2009–2016, PM<sub>10</sub> was not monitored continuously at the same station in Ulaanbaatar. Since 2015, PM<sub>10</sub> has been monitored at 10 stations in Ulaanbaatar and 12 stations/sampling points across the country, while

PM<sub>2.5</sub> is monitored at seven of them. Figure 8.4 shows very high average annual concentrations of PM<sub>10</sub> in Ulaanbaatar, especially at automatic station UB-05 where concentrations do not go below 200 µg/m<sup>3</sup>, on average. This station is located in Sukhbaatar District, in the centre of the city. High concentrations of suspended particles are mainly blamed on the use of raw coal for domestic heating in ger districts.

**Figure 8.4: Average annual concentrations of PM<sub>10</sub>, 2014–2016, µg/m<sup>3</sup>**

Source: National Agency of Meteorology and Environmental Monitoring, 2017.

According to the national air quality standard (MNS 4585:2016), the limit value for 24-hour concentrations of PM<sub>10</sub> is 100 µg/m<sup>3</sup>, which is double that recommended by the WHO Guidelines. The annual limit value of PM<sub>10</sub> is 50 µg/m<sup>3</sup> while WHO recommends a limit value of 20 µg/m<sup>3</sup>.

It is to be expected that the air quality in Mongolia varies greatly between the heavily polluted capital city, inhabited by almost half of Mongolia's 3.1 million citizens<sup>11</sup> and with a population density of 306.5 inhabitants per km<sup>2</sup>, and vast rural areas where population density is between 0.4 and 2.6 inhabitants per km<sup>2</sup>. However, apart from Ulaanbaatar, high concentrations of PM<sub>10</sub> are also recorded outside the capital. For example, in Bayankhongor and Khovd in 2014 and 2015, annual concentrations were between 120 µg/m<sup>3</sup> and 245 µg/m<sup>3</sup>, but monitoring in Bayankhongor was discontinued in 2016. The same applies for Darkhan, where the average annual concentration of PM<sub>10</sub> in 2009 was 174 µg/m<sup>3</sup> and the highest average measured over 30 minutes was 2,470 µg/m<sup>3</sup>. While in Ulaanbaatar, coal consumption for domestic heating and the functioning of three power plants located in the city, industry, construction works and 365,819 vehicles (in 2017) are considered to be the main sources of air pollution, the lack of data in other aimags does not provide enough evidence of the causes of high concentrations of certain pollutants.

In the 2015 Review on the State of Air Pollution in East Asia,<sup>12</sup> the region (which extends south-eastward from north-western Mongolia along the southern parts of the Altay Mountain Range in Mongolia and the northern parts of China along the southern border of Mongolia, including Badain Jaran Desert, Tengger Desert, Mu Us Desert and large parts of the Inner Mongolia region of China) is recognized as a high dust emission zone (> 500 t/km<sup>2</sup>/y). The annual mean dust and sand occurrence frequencies in the Gobi Desert are 19.8/site and 31.7/site respectively. The annual total deposition amount in 2010 was 371.8 million tons.

In 2011, monitoring of fine particles, PM<sub>2.5</sub>, was carried by the one station in Ulaanbaatar (UB-02 traffic). In 2014, PM<sub>2.5</sub> was monitored at two additional stations of NAMEM and, since 2015–2016, four stations of the Air Pollution Reduction Department of Ulaanbaatar City have been measuring PM<sub>2.5</sub>. Although there is a limited set of data on annual concentrations of both PM<sub>10</sub> and PM<sub>2.5</sub> at the same monitoring station (UB-02 traffic), the calculated ratio between these two pollutants is 0.5. However, during the months of May and June 2017, daily concentrations show a significantly lower ratio, about 0.1. According to the Chinese Academy of Meteorological Sciences, this ratio in Northern China is 0.7, while in the EU, the PM<sub>2.5</sub>/PM<sub>10</sub> emissions ratio varies from 0.5 to 0.8. The presence of coarse particles (PM<sub>10</sub>) is not assessed to analyse the contribution of

<sup>11</sup> In 2016, total population was 3,119,935; the population of Ulaanbaatar was 1,440,447. Source: National Statistics Office.

<sup>12</sup> The review was prepared by the Task Force on Research Coordination, Scientific Advisory Committee, Acid Deposition Monitoring Network in East Asia (EANET).

natural sources (e.g. desert dust and sand) to concentrations of particulate matter (PM).

PM components are not analysed as a part of regular air quality monitoring. This exercise would help in detecting not only heavy metals and polyaromatic hydrocarbons but also elements such as Al, Si, K, Ca and Fe, the major contributing elements to crustal matter. A source apportionment study by the World Bank during 2008–2009<sup>13</sup> indicates that the combustion of coal is the largest contributor to the fine PM fraction (PM<sub>2.5</sub>) concentrations, both in concentration and percentage, and accounts for 35–92 per cent of the total PM<sub>2.5</sub> concentration. However, suspended soil particles dominate the coarse fraction (PM<sub>10–2.5</sub>), accounting for 70–90 per cent of the total. According to a study on air pollution by PM in Ulaanbaatar,<sup>14</sup> the determination of composition, source contributions and source locations shows the same results: the factor analysis of PM<sub>10</sub> and PM<sub>2.5</sub> fractions has shown that crustal matter sources (dust and sand) are significant contributors to air PM concentrations in Ulaanbaatar, primarily dominating the coarse fraction (PM<sub>10</sub>). Combustion sources were found to be significant source contributors to air PM, primarily to PM<sub>2.5</sub>.

Tropospheric ozone is currently assessed at seven air quality monitoring stations: all stations are located in Ulaanbaatar; three are part of the state network and four are run by the Air Pollution Reduction Department of Ulaanbaatar City. Measurements at the stations run by this Department started only in 2015. All recorded values are below the national standard, which is aligned with the WHO recommendation (100 µg/m<sup>3</sup> – 8-hour mean) (figure 8.5). It is to be expected that tropospheric ozone will be formed at background locations, due to the high concentration of NO<sub>2</sub> in the city (figure 8.3).

Limit values prescribed for CO concentrations in Mongolia are in line with those recommended by the WHO Guidelines. In the 2002 SoER, it is stated that, during the winter season, three power plants in Ulaanbaatar release 6.76 kg of CO into the air every hour, and that the atmospheric content of CO exceeds the permissible norm by 2–4 times. In 2015, the average content of CO exceeded the limit value seven times at UB-02, once at UB-05, six times in the Tolgoit area and eight times in Zuragt, while, in 2016, it exceeded the limit value once at UB-05, eight times in Tolgoit and seven times in Zuragt.

<sup>13</sup> Source apportionment by receptor modelling from AMHIB data analysis.

<sup>14</sup> Perry K. Davy, Gerelmaa Gunchin, Andreas Markwitz, William J. Trompeter, Bernard J. Barry, Dagva Shagijamba

Analysis of available data draws attention to a single major issue – high concentration of PM<sub>10</sub> in urban areas, since there is no measurement in rural areas. The composition of coarse particles is another important question, since there is uncertainty regarding the contribution of desert dust and dust from aeolian erosion. Particles can be carried over long distances by wind and then settle on the ground or in water. Depending on their chemical composition, the effects of this settling may include making lakes and streams acidic, changing the nutrient balance in coastal waters and large river basins, depleting the nutrients in soil, damaging sensitive forests and crops, affecting the diversity of ecosystems and contributing to acid rain effects. Apart from air pollution, dust also has many negative impacts on agriculture, including reducing crop yields by burying seedlings, causing loss of plant tissue, reducing photosynthetic activity and increasing soil erosion. Indirect dust deposit impacts include covering transportation routes and affecting river and stream water quality.

Airborne dust also presents a serious risk for human health. Dust particle size is a key determinant of potential hazard to human health. Regardless of their composition, suspended particles larger than 10 µm are not breathable. Thus, they can only damage external organs, mostly causing skin and eye irritations, conjunctivitis and enhanced susceptibility to ocular infection. Inhalable particles, those smaller than 10 µg/m<sup>3</sup>, are often trapped in the nose, mouth and upper respiratory tract and can thus be associated with respiratory disorders such as asthma, tracheitis, pneumonia, allergic rhinitis and silicosis. However, finer particles may penetrate the lower respiratory tract and enter the bloodstream, where they can affect all internal organs and be responsible for cardiovascular disorders.

## 8.2 Trends in emission levels

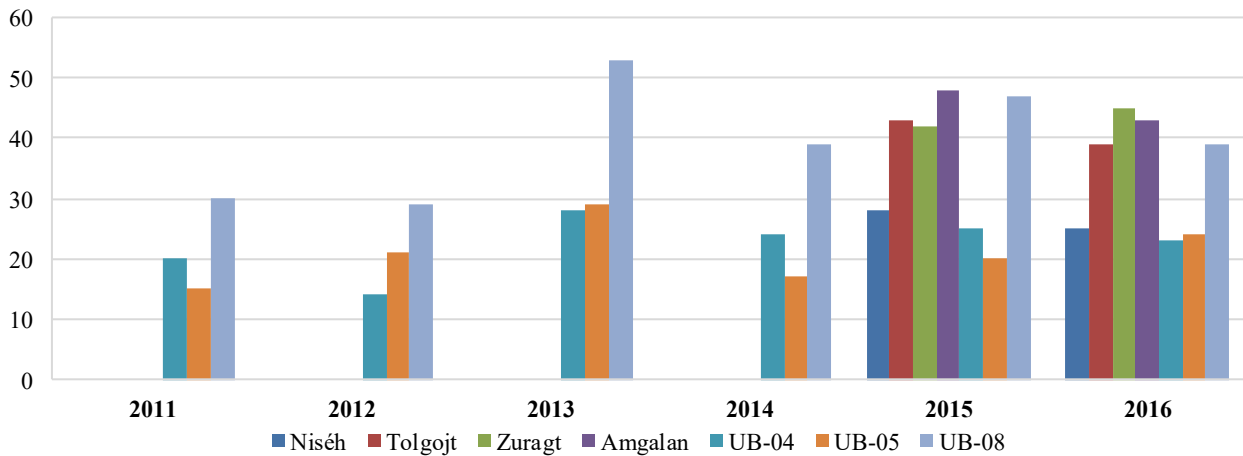
A preliminary emission inventory for Ulaanbaatar was first carried out in 2007. Although the original report attributes some 32.8 per cent of PM<sub>10</sub> emissions to power plants and 22.6 per cent to household stoves in ger districts, in the 2009 World Bank discussion paper "Air Pollution in Ulaanbaatar: Initial Assessment of Current Situation and Effects of Abatement Measures", an update of this emission inventory for Ulaanbaatar is presented, with a ratio of 40.6 per cent of ger households in total emissions of PM<sub>10</sub> and power plants contributing only 15.6 per cent. The

and Sereeter Lodoysamba, "Air particulate matter pollution in Ulaanbaatar, Mongolia: determination of composition, source contributions and source locations", *Atmospheric Pollution Research*, vol. 2, No. 2 (April 2011), p. 126–137.

World Bank discussion paper "Air Quality Analysis of Ulaanbaatar: Improving Air Quality to Reduce Health Impacts" (December 2011) presents another update of

the same inventory, in which these two sources of emissions have a very similar impact of 39 per cent (ger stoves) and 36.8 per cent (power plants).

**Figure 8.5: Average annual concentrations of O<sub>3</sub> in Ulaanbaatar, 2011–2016, µg/m<sup>3</sup>**



Source: Environmental Statistics, EP-8.1 form/Air quality status reports (<http://www.eic.mn>).

**Photo 8.1: Power plant No. 3, Ulaanbaatar**



Despite these results, the National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 (2017 Government Resolution No. 98) states that air pollution studies in Ulaanbaatar show that household stoves in ger districts and 3,200 heat-only boilers operated by entities were responsible for 80 per cent of all air pollution, more than 400,000 vehicles were responsible for 10 per cent, thermal power stations generated 5–6 per cent, and smoke, smog and dust from ash reservoirs and roads and outdoor waste caused 4 per cent. The Programme does not provide more information on the source of these data.

In the scope of JICA's Capacity Development Project for Air Pollution Control in Ulaanbaatar, the first emission measurements at power plants were carried out and data on registration of heating boilers were substantially improved over the period 2010–2012. A new emission inventory was carried out in 2010, taking 2010 as the base year. The revision of this inventory, update for 2011 and elaboration of an emission inventory system and manuals were outputs of another JICA project. In the second phase of the project, the emission inventory was further updated. The annual emission report for 2016 contains data series for the period 2010–2016.

The emission inventory covers only Ulaanbaatar City and selected sources of emissions, and therefore does not provide a tool for assessing air pollutant emissions in the whole country and for all traditional emission sectors. Emissions from the following sectors were considered:

- Power plants, including as a subcategory emissions from their ash ponds;
- Combustion plants, treating separately heat-only boilers and closed-feed water heaters;
- Households, disaggregated to emissions from conventional stoves and improved household stoves;
- Transport, taking into account transport on paved and unpaved roads and soil dust suspension from road surfaces.

Industrial sources and soil dust suspension from surfaces other than roads are not included in the emission inventory, and neither are emissions of ammonia, VOCs, POPs and heavy metals.

Figures 8.6 and 8.7 show the dominant contribution of power plants in total emissions of SO<sub>2</sub> (71.1 per cent in 2016) and NO<sub>x</sub> (72.7 per cent in 2016).

Contrary to the previous versions of the inventory, emissions from power plants are by far the most dominant source of emissions of PM<sub>10</sub> (73.2 per cent in 2016) (figure 8.8). The inventory does not include emissions of PM<sub>2.5</sub>, but includes total suspended particles, a dominant proportion of which (69.25 per cent) were emissions from power plants in 2016.

Transport is the dominant source of CO emissions in 2016 (41.6 per cent), while power plants contribute 16.9 per cent, combustion plants 2.3 per cent and households 29.2 per cent (figure 8.9).

According to the latest available data from the GHG Inventory (2017), CO emissions decreased from 63.63 Gg to 1.54 Gg (97.58 per cent decrease) during the period from 1990 to 2014.

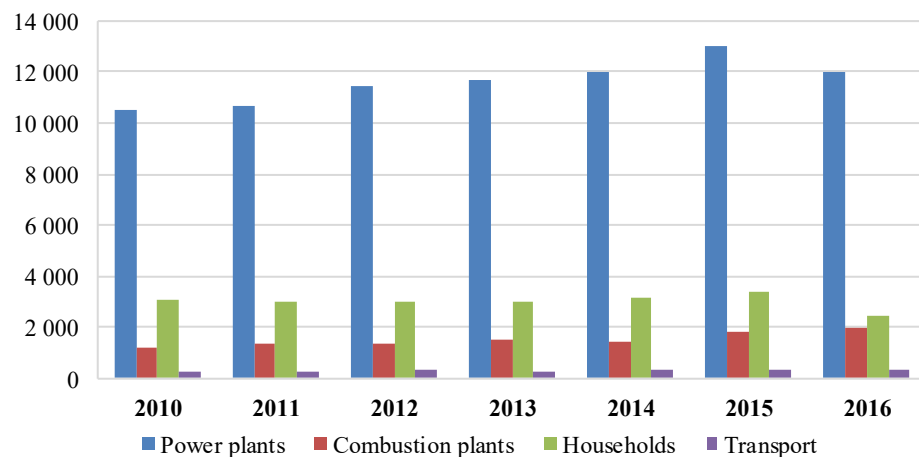
#### *Greenhouse gases*

The GHG Inventory considers the following sectors to be the main sources of GHG emissions in Mongolia: Energy, Industrial Processes and Product Use, Agriculture and Waste. The Land Use, Land-use Change and Forestry (LULUCF) sector is observed as an emissions sink.

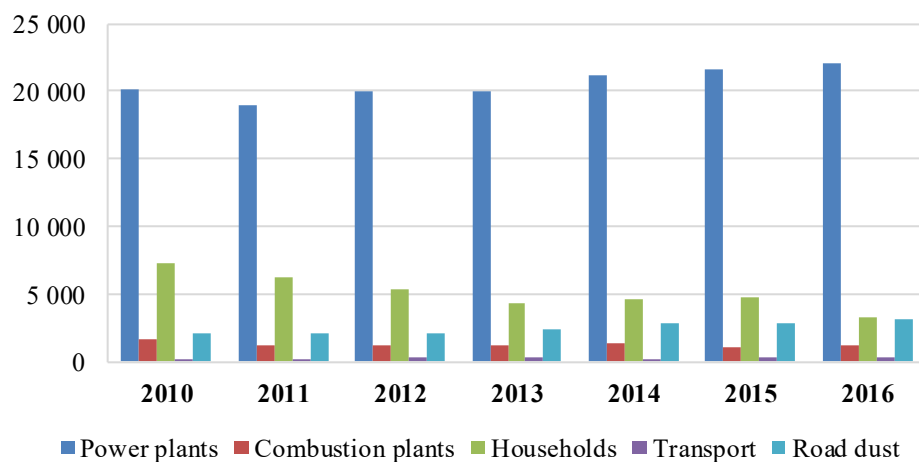
The energy sector is responsible for the lion's share of GHG emissions – 50.01 per cent of total emissions in 2014. The agriculture sector is the second greatest source of GHG emissions, responsible for approximately 48.44 per cent of Mongolia's total emissions in 2014 (figure 7.5). The Industrial Processes and Product Use sector contributed approximately 0.95 per cent of total GHG emissions in 2014, while the Waste sector contribution is negligible. GHG emissions increased significantly in the period 1990–2014, by 12,546.57 Gg CO<sub>2</sub> eq (57.07 per cent) (table 7.2).

#### *Ozone-depleting substances*

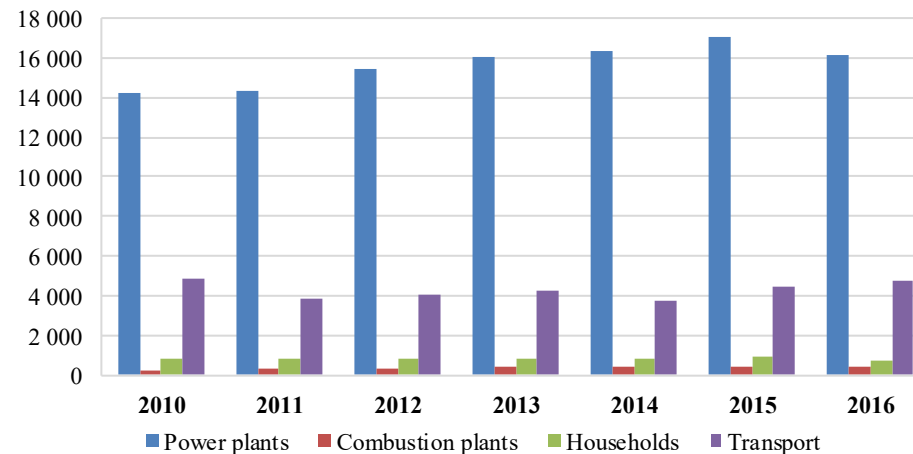
In 2016, Mongolia imported 8.18 tons of ODS, all belonging to refrigerant fluid R22 from the group of hydrochlorofluorocarbons (HCFCs). The total import was 50 per cent less than the established annual quota of 17.5 tons, due to import problems. The annual quota corresponds to 1.4 tons of ozone-depleting potential, as prescribed by Ministerial Order No. A-429 dated 21 December 2015. Since 2012, consumption of ODS decreased drastically, by some 75 per cent (figure 8.10).

Figure 8.6: SO<sub>2</sub> emissions by sector, Ulaanbaatar, 2010–2016, tons

Source: Emission Inventory Report, 2016.

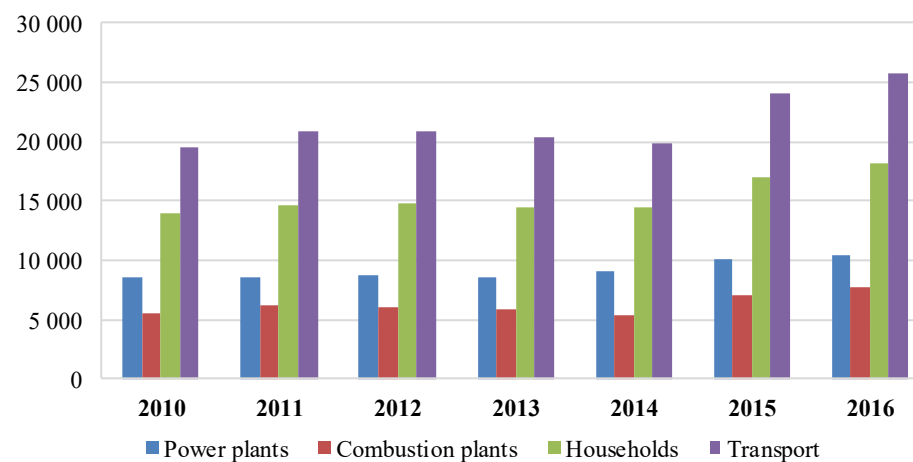
Figure 8.8: PM<sub>10</sub> emissions by sector, Ulaanbaatar, 2010–2016, tons

Source: Emission Inventory Report, 2016.

Figure 8.7: NO<sub>x</sub> emissions by sector, Ulaanbaatar, 2010–2016, tons

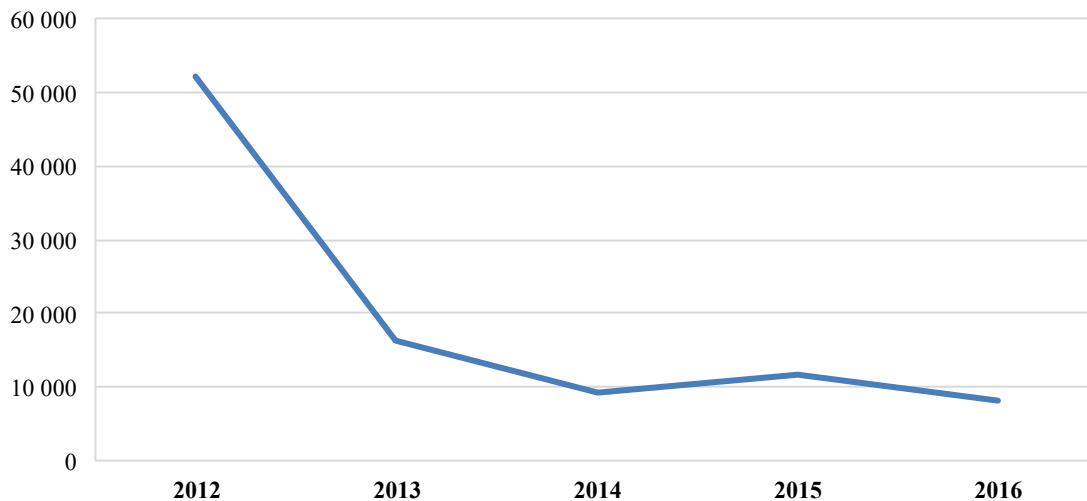
Source: Emission Inventory Report, 2016.

Figure 8.9: CO emissions by sector, Ulaanbaatar, 2010–2016, tons



Source: Emission Inventory Report, 2016.



**Figure 8.10: Consumption of ozone-depleting substances, 2012–2016, tons**

Source: Ministry of Environment and Tourism, 2017.

### 8.3 Performance and gaps in air monitoring networks

Monitoring of air quality in Mongolia started in 1977 with two sampling points in Ulaanbaatar. By the end of the 1970s there were six sampling points in Mongolia, where only two parameters were monitored (SO<sub>2</sub>, NO<sub>2</sub>) by means of passive samplers. During the next decade, the network was enlarged with 12 more sampling points, and during the 1990s another two sampling points were introduced in Ulaanbaatar and one in Darhan. In accordance with the official environmental statistics (<http://www.eic.mn>), since 2004, the number of sampling points was enlarged to 35. In 2009, GTZ (now GIZ) donated four used automatic air quality monitoring stations to the Air Pollution Reduction Department of Ulaanbaatar City (analysers were renewed in 2015). In addition, five fixed and one mobile station were obtained in 2010 with the assistance of the French Government. Another automatic station was installed during 2015, within the scope of a JICA project, again in Ulaanbaatar.

All 11 automatic stations are located in Ulaanbaatar. Six are operated by NAMEM and five by the Air Pollution Reduction Department of Ulaanbaatar City (table 8.2). Air quality in the countryside is monitored by means of passive samplers for a limited number of parameters. Samples are then analysed through chemical analysis.

However, the limited number of monitored parameters do not properly justify the given classification. For example, ozone is measured in urban areas while it

should be primarily measured at background stations, being a secondary pollutant.

Although there is a common opinion that air quality is largely negatively affected by domestic heating in ger districts, there are only four automatic stations in ger areas, of which three have functioned since 2009 and one since 2017, measuring PM<sub>10</sub> and PM<sub>2.5</sub>.

Data sets show that monitoring of air quality is very inconsistent, in that it is rare that the same parameter is monitored at the same sampling site for a longer period, except for passive sampling of NO<sub>x</sub> and SO<sub>2</sub>. Therefore, it is rather difficult to understand trends and changes in air quality and assess the effectiveness of measures implemented to reduce pollution. Moreover, there are examples when monitoring was discontinued after high concentrations of a certain pollutant were recorded at the site. There is persistent monitoring of NO<sub>x</sub> and SO<sub>2</sub> all over the country, including at sites where concentrations are far below set limit values. On the other hand, there is no development of modelling techniques to complement the existing data.

The report "Improving Air Quality Monitoring in Asia" by Clean Air Asia and the ADB places Mongolia among the 17 Asian countries that apply quality assurance/quality control (QA/QC) procedures in collecting and processing air quality data, but it is at the bottom of the list by frequency of application of QA/QC procedures. The QA/QC process is crucial in ensuring that good and adequate data are collected so that the possibility of misinterpretation of air quality data can be minimized.

**Table 8.2: Air quality monitoring network in Ulaanbaatar City, 2017**

Station	Location features	Pollutants						Measuring type	Established	
		SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>1</sub> O <sub>3</sub>			
<b>NAMEM</b>										
UB-1	Industrial zone	√	√	√	√			√	Continuously automatic	1977
UB-2	Roadside	√	√	√	√	√			Automatic	1978
UB-3	Ger area	√	√	√					Chemical analysis	1985
UB-4	Urban area (apartment)	√	√	√	√	√		√	Continuously automatic	1996
UB-5	Ger and apartment area	√	√	√	√			√	Continuously automatic	2009
UB-6	Urban area (apartment)	√	√						Chemical analysis	2009
UB-7	Industrial zone	√	√	√	√				Continuously automatic	2010
UB-8	Background	√	√	√	√			√	Continuously automatic	2010
UB-9	Ger area	√	√						Chemical analysis	2011
UB-11	Ger area	√	√						Chemical analysis	2010
<b>Air Pollution Reduction Department of Ulaanbaatar City</b>										
Niseh	Ger area	√	√	√	√	√	√	√	Continuously automatic	2009
Bayankhoshuu	Ger area	√			√	√			Continuously automatic	2017
Tolgoit	Ger area	√	√	√	√	√	√	√	Continuously automatic	2009
Zuragt	Ger area	√	√	√	√	√	√	√	Continuously automatic	2009
Amgalan	Roadside	√	√	√	√	√	√	√	Continuously automatic	2009

Source: National Agency of Meteorology and Environmental Monitoring, 2017.

Given that the source apportionment exercise indicated that PM<sub>10</sub> content is dominated by suspended soil particles, while fine particles PM<sub>2.5</sub> are more affected by coal combustion, monitoring of air quality and consequent data presentation to the public and for policy development lack additional focus on these two issues.

#### 8.4 Pressures on air quality

##### *Agriculture*

Mongolian agriculture is mostly based on livestock herding in rural parts of the country. The traditional way of nomadic herding does not have significant impact on air quality. On the contrary, yellow dust storms and harsh climatic conditions have devastating impacts on the livestock. For example, the extremely cold winter of 2009–2010 caused the loss of 22 per cent of the country's livestock. The Government, with the assistance of the World Bank, set up an index-based livestock insurance system for herders to protect them from major losses. Under this system, herders bear the cost of small losses (less than 6 per cent livestock mortality rate), while larger losses (6–30 per cent) are transferred to the private insurance companies and losses above 30 per cent are covered by the Government. This is a good example of the country's action on climate change adaptation.

##### *Energy*

Energy production in Mongolia is based on coal-powered plants, making the Mongolian economy very

carbon intensive. Seven coal-fired power plants have a total capacity of about 1,039.5 MW, while some 100 MW are obtained from renewables.

According to the 2016 Emission Inventory Report, three power plants in Ulaanbaatar affect the local air quality, contributing to more than 70 per cent of emissions of SO<sub>2</sub>, NO<sub>x</sub> and PM<sub>10</sub>. Emissions from power plants are not monitored regularly and there is no national emission standard specifically for large combustion plants. In accordance with the 2012 Law on Air and the 2010 Law on Air Pollution Fees, there is a permitting mechanism and obligation on large stationary sources to pay a fee per kg of emitted polluting substance (table 3.1), but it is not clear how this system can function without regular monitoring of emissions. For these reasons, at one point, major emission sources such as thermal power plants refused to pay the emission tax (chapter 3).

Despite the efforts of the Government to diversify energy production and gradually raise the share of renewable energy sources in total energy production to 20–25 per cent by 2020, as of 2014, only 7.62 per cent of total installed capacity was from renewables. The 2007 Law on Renewable Energy establishes a Renewable Energy Fund (no longer in place, chapter 3). In accordance with the 2005 National Renewable Energy Programme (2005–2020), the Taishir HPP was completed but, due to water scarcity, it does not function to its full capacity. From 1999 to 2010, the Government implemented a national programme titled "100,000 solar homes" to supply all herding households in rural areas with renewable energy

sources. Thanks to the programme, 100,000 small PV systems with capacity between 20W and 75W were delivered to the households and herders in rural areas, so that 70 per cent of nomadic Mongolian households have access to green electricity. The Law on Renewable Energy set favourable feed-in tariffs for electricity generated by wind power, which was crucial for the development of the Salkhit wind farm, opened in June 2013. The Government signed a power purchase agreement with Clean Energy, Mongolia's first wind energy company, agreeing to pay US\$95 per MWh. The Salkhit wind farm consists of 31 turbines producing 50 MW. The construction of the 100 MW Orkhon HPP is still pending.

According to the United States National Renewable Energy Laboratory, Mongolia has vast renewable energy potential, estimated at 2.6 TW. The Gobi Desert has been identified as a suitable location for construction of both solar and wind power plants, having 300 days of sunshine per year, a high level of wind resources, low moisture, and low temperatures. The Eg, Selenge, Zavkhan and Hovd River watersheds in the northern and western regions of Mongolia have

also been identified as areas with abundant hydropower resources.

#### *Mining and quarrying*

According to the World Bank indicators, copper, gold, uranium, silver and coal mines account for 20–30 per cent of national GDP and 89 per cent of annual exports. Mongolia has 10 per cent of the world's known coal reserves (an estimated 162 billion tons in 2011), with 17 coal mines in operation. While coal mines are obliged to pay 1 tugrik per kg of extracted coal as an air pollution fee, other mining activities are not charged (chapter 3). Apart from the use of toxic chemicals in different phases of mineral extraction, especially by illegal (artisanal) miners, the lack of paved roads to remote mining sites contributes greatly to formation of suspended soil particles.

#### *Industry*

In the emission inventories produced in Mongolia, the industrial sector is missing. Also, there is no pollutant release and transfer register, which could provide more data on industrial emissions.

**Photo 8.2: Solar energy for herder homes**



Industrial impact on air quality has been elaborated through various studies of the World Bank Clean Air Project, which have concluded that the construction industry is a major source of air pollution, due to the generation of high levels of dust at construction sites. Preconstruction activities include the brick and cement industry, which is in very high demand in Ulaanbaatar. The contribution of these two industries to air pollution include land clearing for sand and clay, the operation of diesel engines on site, combustion of fuel (mostly coal) for brick burning, and transport of the end product to various sections of the city. Secondary sources of pollution from these sites include ash from the combustion of coal, fugitive dust on site, and the open pit sand mining areas, which are 10 km from the city limits.

The leather industry and its leather tanning processes is also a significant contributor to air pollution. The 2010 Law on Air Pollution Fees prescribes a fee for importers and producers of organic solvents.

### *Transport*

According to the 2016 Emission Inventory Report, in 2016, transport accounted for 43.6 per cent of total CO emissions, 21.5 per cent of total emissions of NO<sub>x</sub>, 2.2 per cent of total emissions of SO<sub>2</sub> and 1.1 per cent of PM<sub>10</sub>. While contributions to SO<sub>2</sub> and PM<sub>10</sub> emissions are negligible, the transport contribution to total emissions of NO<sub>x</sub> and especially CO is estimated to be quite high. It has to be taken into account that only road transport has been considered and that the formation of road dust has been estimated separately, with a contribution of 10.4 per cent of total PM<sub>10</sub> emissions.

The GHG Inventory does not cover the transport sector. However, in accordance with the Law on Air Pollution Fees, vehicle owners are obliged to pay an annual fee based on CO<sub>2</sub> emissions per km. The annual fee is symbolic and corresponds to US\$0.75–US\$3.90.

### *Housing*

Mongolia has experienced accelerated urbanization during the last two decades. Repeatedly hit hard by natural disasters since 2000, herders increasingly moved to the capital city and other towns in search of better access to education and health services and, most importantly, job opportunities. National statistical data show that the population of the capital grew to 1,440,447 in 2016, accounting for 46 per cent of the total population. Migration of the population to urban centres was not followed by adequate investment in infrastructure. It is estimated that

approximately 736,000 residents – 61 per cent of Ulaanbaatar's population – live in so-called ger districts. Ger districts usually lack access to utilities (such as water, electricity, heating and waste collection) and inhabitants live in gers or in spontaneously built houses with bad insulation.

During extremely cold winters, consumption of coal and other flammable materials is very intensive and, due to the use of basic heating devices, the impact on air quality is significant. However, available data on the contribution of ger districts to air pollution in Ulaanbaatar are either controversial or insufficient. For example, the 2008 Emission Inventory Report for Ulaanbaatar mentioned ger districts as a dominant source of air pollution, while the 2016 report has the districts accounting for 2.24 per cent of SO<sub>2</sub> emissions, 3.54 per cent of NO<sub>x</sub> emissions, 10.3 per cent of PM<sub>10</sub> and 28.3 per cent of CO emissions in 2016. NAMEM's sampling points marked as located in ger districts measure only SO<sub>2</sub> and NO<sub>x</sub> (table 8.2).

The Government of Mongolia and international donor community realized numerous projects in ger districts, providing clean fuel and improved heating stoves, and similar actions are still ongoing. The National Committee for Reducing Air Pollution decided to spend funds from the 2017 state budget on ensuring reliable electricity supply to families living in ger areas, nullifying fees for night-time power usage (chapter 3), supplying households with eco-friendly stoves and increasing briquette supply.

## **8.5 Legal, policy and institutional framework**

### *Legal framework*

The revised 2012 Law on Air is the main legal instrument aimed at air protection and pollution prevention, mitigation and control. The Law lists the competences of public administration bodies, companies, organizations and citizens. A separate chapter deals with activities and principles to mitigate air pollution. Four of seven measures are focused on ger districts, two are related to prevention of migration to urban areas by creating favourable conditions in rural areas and one is aimed at support of innovations to combat air pollution. The Law grants incentives to households that invest in air protection measures, such as insulation, efficient stoves, chimney filters, more eco-friendly fuel, connection to the electricity grid and use of renewable energy. For example, the recent decision to grant an electricity tariff incentive during night hours is approved for those households that meet criteria set in Article 14 of the Law on Air (e.g. having insulation, two-phase electricity meter, etc.) The Law requires major stationary sources to install equipment

to monitor air emissions and abatement equipment, and prescribes fines for violating emission standards. The maximum fine for an installation that violates emission standards is nine times the monthly minimum wage in tugriks, which is not considered effective and dissuasive. Installations considered to be a "major stationary source" release more than 100 tons of any polluting substance annually, or more than five tons of hazardous polluting substances.

The 2010 Law on Air Pollution Fees (as amended in 2012) prescribes fees for miners of raw coal, organic solvent users, producers and importers, vehicle owners, major stationary sources and other sources of air pollution. This Law improves the provision on violation of emission standards and prescribes that, when emissions from a major source exceed emission standards (based on the conclusions of the professional organization determined by the Law), the environmental inspector shall eliminate the damage, require the polluter to pay reimbursement three times higher than the value of the damage, and oversee payment of the reimbursement and remedy of damage. Although this provision is much stricter than the one in the Law on Air, it poses implementation challenges related to "limination and remedy of damage" caused by air pollution and estimation of the value of damage. The fee proposed by the Law for emission of polluting substances into the air is 10–30 tugriks per kg of polluting substance emitted. The annual CO<sub>2</sub> tax for vehicles is in the range between 1,800 tugriks (US\$0.75) and 9,500 tugriks (US\$3.90), depending on emission of CO<sub>2</sub> per km for vehicles with petrol engines and on the engine size for vehicles powered by diesel (chapter 3). Vehicles that emit 120 g/km or less of CO<sub>2</sub> are exempted from this tax, as are grain combines and tractors. Exemption from fee payment or certain discounts can also be granted to producers of raw coal and energy, in order to ensure national security and protect the public interest.

The maximum permissible level of air pollutants from household heating, thermal power stations, steam and water heating furnaces, waste incineration furnaces and crematoria is regulated by national standards (MNS 5043:2016, MNS 5919:2008, MNS 6298:2011, MNS 6342:2012, MNS 5606–1:2016). From analysis of the legal framework, it is not clear whether the application of these particular standards is mandatory, since there is no reference to these standards in legislative acts.

#### *Policy framework*

The Air Protection Programme (1999 Government Resolution No. 82), accompanied by an action plan, was developed in 1999 and has been followed by a

significant number of studies, projects and policy documents.

#### Air pollution focus of key development policy documents

In recent years, all major development policy documents tackle the air pollution problem: the 2014 Green Development Policy, 2015 Mongolia's Nationally Determined Contribution, 2016 Governmental Action Programme for the period 2016–2020, 2016 Mongolia Sustainable Development Vision 2030 and 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025.

The Governmental Action Programme for the period 2016–2020 envisages measures for the promotion of new coal production technologies, improvement of environmental monitoring, especially industrial production that has negative effects on the environment, establishment of the Environment and Climate Change Fund and reduction of pollution. Apart from measures strictly related to pollution prevention and control and environmental protection in general, this comprehensive policy document reflects the integration of environmental goals into other sectoral policies, advocating for sustainable and green economy, renewable energy and energy efficiency, sustainable and environmentally friendly transport, promoting EE and raising public awareness on environmental issues.

Mongolia Sustainable Development Vision 2030 foresees in its Phase I (2016–2020) the elimination of air pollution in Ulaanbaatar City, under its second objective related to improvement of environment and city planning. Taking into account the nature of this document, it is understandable that there are no details on how to achieve this ambitious goal. The Government of Mongolia has set a list of indicators to measure the level of achievement of the Vision, including an environmental performance index. In the Resolution on approving Mongolia Sustainable Development Vision 2030, the State Great Khural gave the mandate to the Government of Mongolia to perform monitoring and evaluation of whether national, sectoral and cross-sectoral policies approved by the State Great Khural and the Government have coherence and are coordinated with the Vision and to reformulate policies as necessary.

Despite the primary goal of the national contributions to mitigate climate change, Mongolia formulated the mitigation actions of its 2015 INDC (now the NDC) with the related benefit of air pollution reduction. The document foresees reduction of fuel use in individual

households through improving stove efficiency and development of a bus rapid transit (BRT) system and improvement of the public transport system in Ulaanbaatar. It also envisages: an increase in renewable power capacity as a share of total power generation capacity from 7.62 per cent in 2014 to 20 per cent by 2020 and to 30 per cent by 2030; reduction of electricity transmission losses; reduction of building heat loss by 20 per cent by 2020 and by 40 per cent by 2030, compared with 2014 levels; and reduction of internal energy use of CHP plants through improved plant efficiency and implementation of advanced technology in energy production, such as super critical pressure coal combustion technology, by 2030. In the transport sector there is a plan to improve the national paved road network, which can contribute to the reduction of suspended particles emission from transport. In the industrial sector, reduction of emissions is planned in the cement industry through upgrading the processing technology from wet to dry processing.

The 2014 Green Development Policy considers project efforts and existing policy on air quality improvement as its integral part, acknowledging that, in an effort to address the country's environmental problems and set the economy on a sustainable path, Mongolia needs a strategy for green development.

#### National Programme on Reduction of Air and Environmental Pollution

The most detailed and comprehensive, at the same time the most recent, policy document dealing with air quality improvement is the National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025, adopted in 2017.

The Programme will be implemented during the period 2017–2025 in two main phases: short term, 2017–2019 and medium term, 2020–2025. The Programme envisages 60 measures divided into five areas. Although it is a programme for reducing air and environmental pollution, it clearly focuses on air pollution with more than 50 measures. Among them, more than 20 are designed to mitigate air pollution in the capital city, highlighting more eco-friendly heating and other activities in ger districts. Some 10 measures are aimed at minimizing the impact of transport, construction works and other industries. The remaining measures are related to improvement of the strategic and legal framework, monitoring of air quality and raising public awareness.

The Programme uses as its starting point the results of air pollution studies on pollution sources in Ulaanbaatar, which show that household stoves in ger

districts and 3,200 heat-only boilers operated by different entities were responsible for 80 per cent of all air pollution, more than 400,000 vehicles for 10 per cent, thermal power stations generated 5–6 per cent, and smoke, smog and dust from ash reservoirs, roads and outdoor waste caused 4 per cent. The Programme does not elaborate further on these statistics, but it is obvious that emissions from power plants are not tackled at all, and neither are contributions from natural sources. The Programme recognizes the need for data improvement as well as improvement of the legal framework.

Despite numerous project activities and government interventions to improve air quality, there is no systematic assessment of their effects.

#### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Targets 3.9 and 11.6 is described in box 8.1.

#### *Institutional framework*

The Government of Mongolia approves the national programmes on climate change and air protection, and organizes their implementation. The Government is also in charge of preparation of the budget required for mitigation of air pollution and preparation of the National Programme for Reducing Air and Environmental Pollution and reporting on its implementation to the State Great Khural. According to the Law on Air, the Government is also in charge of expanding and increasing the capacity of the electricity transmission and distribution network in the air quality improvement zone and establishing incentives for households in ger districts within the air quality improvement zone, and for citizens, entities and organizations that apply recommendations set in the Law on reducing heat loss and saving power. Among the Government's responsibilities is also the development of an infrastructure plan aimed at preventing further concentration of the population in the capital city by creating more favourable living conditions in other regions.

The Ministry of Environment and Tourism, as the state body in charge of environmental issues, also has responsibilities regarding air quality, including coordination of the implementation of legal and policy acts, organization of air quality monitoring, developing standards and methods, creating a database on air and issuing permits to major stationary sources. The Ministry does not have a separate department for air protection.



### Box 8.1: Targets 3.9 and 11.6 of the 2030 Agenda for Sustainable Development



#### **Goal 3: Ensure healthy lives and promote well-being for all at all ages**

##### **Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination**

To track the global indicator 3.9.1 (Mortality rate attributed to household and ambient air pollution) in Mongolia, it is necessary to define a methodology and information source. However, the 2016 WHO report "Ambient Air Pollution: A Global Assessment of Exposure and Burden of Disease" offers an estimation of modelled population exposure to PM<sub>2.5</sub> and the number of deaths attributable to ambient air pollution in Mongolia. It estimates that high exposure of the population in urban areas of Mongolia is 51 µg/m<sup>3</sup>. This caused 40 premature deaths per 100,000 inhabitants in 2012 in Mongolia, or 1,123 premature deaths in total. In this report, Mongolia is considered in a group of low- and middle-income countries in the Western Pacific region and, compared with countries in the group, has a slighter lower exposure of its urban population to ambient PM<sub>2.5</sub> than average, which is set at 54 µg/m<sup>3</sup>. However, taking into account the population size of Mongolia, the number of premature deaths in Mongolia is a little higher than the group average (1,102). The highest disease burden is attributed to ischemic heart diseases.

Concern related to the impact of air pollution on health initiated various studies in Mongolia, including "Understanding and Addressing the Impact of Air Pollution on Children's Health in Mongolia" (UNICEF, 2016), "Air Quality Analysis of Ulaanbaatar: Improving Air Quality to Reduce Health Impacts" (World Bank, 2009), "Environmental Health Profile of Mongolia" (WHO, 2016) and many others.

The UNICEF study concludes that exposure to air pollution causes significant impacts on children, resulting in deaths from pneumonia in infants, and lung damage that affects the health and well-being of children throughout the rest of their lives. It points out that there is an increased recognition that indoor environments dominate exposures to air pollution and this requires interventions to reduce air-pollution-related disease in the three principal environments in which children are exposed: during prenatal care and the first year of life, indoors at home and indoors at school.

The World Bank study calculated that health damage from air pollution in 2008 corresponded to 18.8–27.9 per cent of GDP in Ulaanbaatar and 8.8–13.1 per cent of GDP in Mongolia. While the estimated health effects are significant, it should still be noted that the calculations did not take into account exposure to indoor air pollution.

Although Mongolia has one of the world's largest coal reserves, the country tries to diversify its energy profile, which is heavily dependent on coal consumption. In order to ensure access to affordable, reliable, sustainable and modern energy for all (Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all), Mongolia should contribute to a substantial increase of the share of renewable energy in the global energy mix.

#### **Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable**

##### **Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management**

Target 11.6 is measured by Indicator 11.6.2 (Annual mean levels of fine particulate matter (e.g. PM<sub>2.5</sub> and PM<sub>10</sub>) in cities (population weighted)), among other indicators.

Air pollution in Ulaanbaatar presents one of the major public concerns in Mongolia. Numerous actions were implemented in order to reduce the city's air pollution, starting with provision of more efficient stoves and fuels, especially in ger districts, cutting the electricity tariff during night hours in order to encourage heating with electric heaters, provision of technical support to stove and boiler suppliers and producers, developing affordable housing and city greening.

Annual concentrations of PM<sub>10</sub> in Ulaanbaatar (figure 8.4), show a certain decline, but due to inconsistent measurements and lack of data analysis, the results of actions taken are difficult to estimate. As of 2017, PM<sub>10</sub> is measured at six automatic air quality monitoring stations, while PM<sub>2.5</sub> is monitored at two automatic monitoring stations run by NAMEM in Ulaanbaatar. In addition, both PM<sub>10</sub> and PM<sub>2.5</sub> are monitored at five automatic stations run by the Air Pollution Reduction Department of Ulaanbaatar City (table 8.2).

Regular assessment of air quality does not take into account the contribution of sand and dust, especially to PM<sub>10</sub>. With three power plants in the city with a total capacity of more than 900 MW, and consumption of 4.9 million tons of coal in 2016, thus emitting 21,328 tons of PM<sub>10</sub> according to the 2016 Emission Inventory, little attention is given to power plant emissions, which are not regularly controlled.

Reduction of air pollution in Ulaanbaatar will remain a significant challenge if focused activities based on scientific evidence and reliable data are not developed and monitored in a sustainable manner in order to show progress from efforts invested.

The National Agency of Meteorology and Environmental Monitoring (NAMEM), as a professional office, as stipulated in the Law on Air, is in charge of monitoring and reporting on air quality, compiling the national inventory of air emissions and implementation of national programmes related to air protection, as well as the fulfilment of the country's obligations under the international treaty on ozone-layer protection.

The General Agency for Specialized Inspection (GASI) is in charge of law enforcement.

The National Committee for Reducing Air Pollution has functioned since 2011 (chapter 1) and includes representatives not only of the Government but also of civil society.

In accordance with the structure of Mongolia's administrative division, aimag and soum bodies with responsibilities in the area of environmental protection (chapter 1) are in charge of implementation of aimag/soum legal and policy acts, compiling an inventory of emissions, informing the public on air quality data, ensuring the introduction of more ecologically friendly means for district/household heating (electricity, gas, and coke-fired heating technology) and supplying low-income households living in the air quality improvement zone with insulation materials for houses and building, improved stoves, non-polluting tablets, semi-coke and liquefied petroleum gas.

The Ulaanbaatar City Government established the Air Quality Division under the Nature and Environmental Protection Department in 2006, which was upgraded to the Air Pollution Reduction Department of Ulaanbaatar City in February 2009.

#### *Economic, fiscal and information measures*

While fines for air pollution stipulated in the Law on Air Pollution Fees are rather symbolic (chapter 3), investments in air protection in Mongolia have been quite high in recent years, especially including international aid. According to the Ministry of Environment and Tourism, between 2011 and 2015, the Government spent more than US\$37 million, plus US\$47 million from international donors, on tackling air pollution.

#### Clean Air Fund

With the endorsement of the Law on Air in 2010, the Clean Air Fund became operational as of January 2011. The Fund financed actions such as providing improved fuel and improved fuel-saving stoves for

households, expanding green areas of Ulaanbaatar by 1,700 ha, establishing green zones along the valleys of the Tuul, Selbe and Uliastai Rivers, expanding small parks in Ulaanbaatar by 2,300 ha, promoting the use of gas fuel in ger districts, reducing pollution from vehicles, enabling technology advancement in more than 60 small- and medium- capacity heat-only boilers and raising public awareness of the importance of reducing air pollution. However, the Fund was abolished in November 2015 (chapter 3).

The 2017 National Programme for Reducing Air and Environmental Pollution envisages the establishment of an anti-air-pollution fund, centralizing all budgets and resources for reducing air pollution, with an integrated management/administration.

#### Tariffs

Since the beginning of 2017, a special zero night tariff, applicable from 9 p.m. to 6 a.m., is available for residents of ger districts with metered electricity consumption. This subsidy is offered during winter (January–March) and is designed to create incentives for using electric heating rather than polluting coal-fired stoves (chapter 3).

#### Air Quality Index

The Air Quality Index (AQI) in Ulaanbaatar is available online from several sources, but values differ.

The annual average concentration of pollutants in air (only SO<sub>2</sub> and NO<sub>x</sub>), by aimag centre and the capital, are available on the website of the NSO (<http://www.1212.mn/statHtml/start.jsp>) but expressed in mg instead of µg.

On its web portal (<http://www.eic.mn>), the EIC offers daily average values for previous months/years, depending on availability of data, by station and for concentrations of SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, applying a simple air quality index, which just repeats the highest measured value of monitored pollutants.

The web page <http://www.tsag-agaar.mn> provides the weather forecast and daily, monthly and annual data on air quality, covering more parameters (SO<sub>2</sub>, NO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) and a link to another air quality index, only for Ulaanbaatar (<http://agaar.mn/index>), which is also available on a mobile application.

The third air quality index can be found on the Ulaanbaatar air quality web page (<http://www.ub-air.info/ub-air/en/>), where it is clearly stated that



monitoring data come from the Air Pollution Reduction Department of Ulaanbaatar City. Although values are different, the colours of the AQI are in accordance with the national standard MNS 4585:2016. Data cannot be compared with those on <http://agaar.mn/index>, since an average hourly value is given for the whole city, while the former calculates the AQI separately for each sampling point. However, <http://www.ub-air.info> shows negative values for the AQI and might need some adjustments.

Mongolian standard MNS 4585:2016 prescribes the method for calculation of the Air Quality Index as follows:  $AQI = (BBA/XXX) * 100$ , where AQI is Air Quality Index, BBA is concentration of pollutants in the air and XXX is the permissible amounts of the pollutants in the air quality standard. The highest value among calculated pollutants is presented as AQI. Bearing in mind that the main pollution problem is high concentrations of PM<sub>10</sub>, and that the Mongolian limit value for the 24-hour average concentration of PM<sub>10</sub> is 100 µg/m<sup>3</sup>, in most of the cases, AQI will correspond to the real PM<sub>10</sub> concentration, since the XXX value from the equation above is 100. Having regard to the categories of the Mongolian AQI – with AQI in the range 0–50 being categorized as clean, 50–100 normal, 101–250 low pollution, 251–400 moderate pollution and 401–500 high pollution – the AQI could be misleading, considering, for example, concentration of 250 µg/m<sup>3</sup> of PM<sub>10</sub>, which would result in an AQI of 250, thus falling into the category "low pollution".

One more air quality index is offered, on a web page of the United States Embassy in Mongolia (<http://aqicn.org/city/ulaanbaatar/us-embassy/>). It is complemented by an air quality forecast and disclaimer stating that "StateAir.mn observational data are not fully verified or validated; these data are subject to change, error, and correction. The data and information are in no way official". This index is based only on PM<sub>2.5</sub> concentrations and developed by the United States Environmental Protection Agency.

Apart from the fact that different data, information, indexes and methods of their calculation can confuse the public, they can also diminish public confidence in official data quality. As a means to inform and alert the population during bad air quality episodes, the Air Quality Index in Mongolia is valid only for Ulaanbaatar, which has automatic air quality monitoring allowing the sharing of near-real-time data with the public.

## 8.6 Participation in international agreements and processes

Following European experiences in implementation of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) under the Convention on Long-range Transboundary Air Pollution, the Acid Deposition Monitoring Network in East Asia (EANET) was established as a regional cooperative initiative to promote efforts towards environmental sustainability and protection of human health in the East Asian region. EANET aims to create a common understanding of the state of the acid deposition problems in East Asia, provide useful inputs for decision-making at local, national and regional levels and contribute to cooperation on issues related to acid deposition among the participating countries. Mongolia is one of 17 countries participating in EANET, with two measurement stations in the country, where wet and dry deposition (concentration of pollutants in precipitation and in air) is monitored (table 8.1).

Mongolia participates in the implementation of the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer (chapter 6). The country does not produce ODS and has phased out other substances, except HCFC, in accordance with the Protocol. The gradual phase-out of HCFC substances is scheduled as follows: reduction of 10 per cent by 2015, 35 per cent by 2020, 67.5 per cent by 2025 and final phase-out, 100 per cent by 2030. Import of ODS is regulated through the licensing system (1999 Government Resolution No. 129).

Mongolia is a party to the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and Paris Agreement (chapter 7). In its NDC, Mongolia is aiming for a 14 per cent reduction of GHG emissions by 2030 compared with a BAU scenario. Measures to achieve this reduction include those that also benefit air pollution reduction, such as:

- Reducing fuel use in individual households through improving stove efficiency;
- Improving the public transport system in Ulaanbaatar;
- Improving the national paved road network;
- Increasing the share of private hybrid road vehicles from approximately 6.5 per cent in 2014 to approximately 13 per cent by 2030;
- Shifting from liquid fuel to LPG for vehicles in Ulaanbaatar and aimag centres;
- Reducing building heat loss by 20 per cent by 2020 and by 40 per cent by 2030, compared with 2014 levels.

Mongolia is also party to the Convention on Persistent Organic Pollutants (Stockholm Convention) (chapter 6). The updated 2014 NIP (2014 Government Resolution No. 341) contains a set of measures to reduce emissions of dioxins and furans from open burning of waste, medical waste incineration, coal-fired power plants, heating boilers and household stoves. It also foresees adding the limit values for dioxins, furans and mercury to the standard regulating waste gases from power and thermal plants by 2020.

## 8.7 Assessment, conclusions and recommendations

### *Assessment*

There are some gaps related to coordination of data collection, processing and disbursement, which, according to the revised 2012 Law on Air, should be a task of the professional office established and supervised by the Ministry. The National Agency of Meteorology and Environmental Monitoring performs these tasks and is also in charge of compiling the national inventory of air emissions.

Being a very important issue for Mongolia, air protection is dominantly managed by high-level administrative bodies, while the involvement of scientific, professional and civil society organizations is marginalized. Government policies are more focused on the capital city, while bad air quality in other regions is not elaborated, which might be caused by the lack of data. The contribution of power plants and ger districts, and resuspension of dust-to-air pollution is also not adequately assessed. There is no regular monitoring or self-monitoring of emissions by major polluters, insufficient air quality monitoring in ger districts and no comparison of air quality data with monitoring data on dust storms or regular analysis of the contents of PM.

The Government realized numerous projects in ger districts, providing clean fuel and improved heating stoves, and plans to support poor communities with incentives and other types of support in order to achieve environmental goals.

Despite the intensive public and government attention to, and significant investment in, air protection, the legal framework in this area does not provide very strict rules, effective fines and functional mechanisms for the application of the "polluter pays" principle.

## *Conclusions and recommendations*

### Air quality monitoring

Although Mongolia's air quality monitoring network seems robust with 40 monitoring sites (35 operational stations, including six automatic ones, under the National Agency of Meteorology and Environmental Monitoring (NAMEM), plus five automatic stations under the Air Pollution Reduction Department of Ulaanbaatar City), only 11 of them are automatic and located in Ulaanbaatar. Other sampling points are based on the use of passive samplers, mainly monitoring only SO<sub>2</sub> and NO<sub>x</sub>. Taking into account high investments in air pollution reduction, as well as estimation of health-related costs caused by air pollution, the existing monitoring of air quality does not provide enough support for better policy development and monitoring of the effectiveness of implemented measures. Further efforts to reduce the adverse per capita environmental impact of cities (SDG Target 11.6) require special attention to air quality, through obtaining reliable, accurate, consistent and comparable data on concentrations and emissions of air pollutants among other means.

### Recommendation 8.1:

*The Government should:*

- (a) *Gradually replace obsolete air quality monitoring techniques with a more efficient and less costly organized air quality monitoring network coupled with air quality modelling for locations exposed to similar impacts;*
- (b) *Focus on the monitoring on fine particulate matter (PM<sub>2.5</sub>), since it has more adverse effects on human health and is less affected by dust than PM<sub>10</sub>;*
- (c) *Install background monitoring stations in locations that are not affected by industrial activities and extensive coal consumption, to assess natural contributions to air pollution.*

### Information and data on particulate matter

Particulate matter is considered to be the main pollutant in Mongolia, especially in Ulaanbaatar. Yet there is limited scientific knowledge about its content and source. The dust storms from the Gobi Desert (predominantly yellow sand) contribute substantially to sporadic PM pollution peaks. During these dust storms, PM measurements of more than 1,000 µg/m<sup>3</sup> were recorded in north-east China and Mongolia.

Recommendation 8.2:

*The National Agency of Meteorology and Environmental Monitoring, in cooperation with relevant international bodies, should develop expertise for regular analysis of the content of particulate matter, in order to regularly generate data on PM content, such as heavy metals and polyaromatic hydrocarbons, and assess the contribution of sand and dust in coarse particles.*

Recommendation 8.3:

*The Ministry of Environment and Tourism should define the methodology for definition of concentration peaks caused by dust storms, which are not counted in annual average concentrations of particulate matter.*

Major stationary sources of air pollution

The revised 2012 Law on Air requires major stationary sources to install equipment to monitor air emissions and abatement equipment. The Law also prescribes fines for violating emission standards. However, the fines are too low to serve as an incentive to install the abatement equipment. Data on emissions from power plants and heat-only boilers are available only from a JICA-supported project on on-site stack gas measurements to acquire reliable data on emissions as a basis for rational decision-making and for developing the emission inventory. This was a one-time exercise implemented during the period 2010–2012, though the project provided training for four representatives of environmental institutions and five power plant technicians.

Recommendation 8.4:

*The Government should:*

- (a) *Ensure implementation of the provisions of the Law on Air regarding monitoring of the emissions from major stationary air polluting sources by regular control of their emissions and provisions related to limitation or temporary closure of operations of the major stationary air-polluting sources in the event of violation of emission standards;*
- (b) *Ensure that fines for violation of emission standards are effective and dissuasive.*

Air Quality Index

The Mongolian Ambient Air Quality Standard MNS 4585:2016 prescribes the method for calculation of an Air Quality Index. The prescribed methodology makes the Air Quality Index misleading, as, in most cases, the values of the Air Quality Index would correspond to the real PM<sub>10</sub> concentrations.

Recommendation 8.5:

*The Government should change the methodology for calculation of the Air Quality Index.*

Health impact

The 2010 Law on Air Pollution Fees prescribes that a fine for major sources that exceed emission standards should be calculated on the basis of estimated value of the damage. The most significant environmental damage caused by air pollution is damage to human health, which cannot be easily recognized immediately after an exceedance of emission limit values by an installation. Moreover, this kind of damage does not allow for a traditional environmental remedy, or the estimation of its cost. In order to substantially reduce the number of deaths and illnesses from air pollution, in line with SDG Target 3.9, it is necessary to develop mechanisms to estimate population exposure to air pollution and its consequences.

Recommendation 8.6:

*In order to allow for proper implementation of the Law on Air Pollution Fees, the Government should adopt precise methodology for estimation of population exposure and calculation of the economic cost of the health impact of air pollution, or a methodology to calculate the value of damage caused by an exceedance of emission standards on the basis of its duration, toxicity of the emitted polluting substance(s) and the level of exceedance.*

Data on air emissions on national level

Despite the fact that the legal competence for compilation of the air emission inventory is assigned to the National Agency of Meteorology and Environmental Monitoring by the revised 2012 Law on Air, there is no available data on air emissions on a national level. Available data cover only Ulaanbaatar City and categories of emission sources are not comparable with internationally common categories.

Recommendation 8.7:

*The National Agency of Meteorology and Environmental Monitoring should develop the capacities for compilation and regular update of the national air emission inventory, following, for example, the EMEP/EEA air pollutant emission inventory guidebook or making it compatible in terms of categories and emission sources data with GHG inventories developed in accordance with relevant decisions adopted by the bodies of the UNFCCC or of agreements deriving from it.*

## Chapter 9

# WATER MANAGEMENT

### 9.1 Water resources

Mongolia is a country with scarce water reserves. The key reasons for this are the severe continental dry climate in the highlands of Central Asia, rare rainfall in Mongolia with a very high level of evaporation and most of the bigger rivers actually having outgoing flows. Precipitation is the only source of surface water and groundwater. About 70 per cent of water resources and flows are formed in the Mongolian Altai, Hangang, Khuvsgul and Hentai mountainous areas, which make up 30 per cent of the territory of Mongolia. Annual water resources are estimated at around 565 billion m<sup>3</sup> (table 9.1). Of the total water resources, 88.5 per cent accumulates in the lakes, 3.4 per cent is in glaciers, 6.1 per cent forms in river systems and 1.91 per cent is groundwater.

The territory of Mongolia covers three drainage basins (table 9.2). The Central Asian Internal Drainage Basin is the largest and includes the Great Lakes Depression, including Lake Uvs, Lake Khar-Us, Lake Khar and Lake Khyargas.

The total length of rivers and streams in Mongolia is approximately 67,000 km. In 2016, of 5,585 rivers and

streams, 263 were dried out, of 11,420 springs, 774 were dried out and 106 recovered, and of 2,214 lakes and ponds, 346 were dried out and 31 recovered (table 9.3).

About 60 per cent of the Mongolian rivers flow to the Russian Federation and People's Republic of China and 40 per cent flow into the Gobi Desert lakes. Mongolia's water resources are distributed unevenly throughout the country (with sufficient water resources in the north and extremely limited resources in the south). The flow of rivers is not stable.

There are significant seasonal and regional changes, especially in the Central Asian Internal Drainage Basin. This is a result of the severe winter, which holds down the rivers for half a year and reduces or stops the flow, reduction of precipitation from north to south, and aridity of the Gobi Desert region, where a lot of water is lost because of evaporation and infiltration. Surface water resources and the river network of Selenge, Khovsgol, Bulgan, Arkhangai and Khentii Aimags are relatively high among the aimags, while the water resources of Gobi Altai, Sukhbaatar and Bayankhongor Aimags are scarce.

**Table 9.1: Water resources, billion m<sup>3</sup>**

	Amount	Percentage
Lakes, of which	500.00	88.53
Saline	90.00	
Fresh	410.00	
Rivers	34.60	6.13
Glaciers	19.40	3.43
Groundwater	10.80	1.91
<b>Total</b>	<b>564.80</b>	<b>100.00</b>

Source: Ministry of Environment and Tourism, 2017.

**Table 9.2: Distribution of water resources among drainage basins**

	Water resources (km <sup>3</sup> )	National territory under the drainage basin (%)
Arctic Ocean Basin	16.90	20.50
Pacific Ocean Basin	13.90	11.50
Central Asian Internal Drainage Basin	3.80	68.00
<b>Total</b>	<b>34.60</b>	<b>100.00</b>

Source: Ministry of Environment and Tourism, 2017.

**Table 9.3: Surface water bodies, 2003, 2007, 2011, 2013–2016, number**

	Rivers and streams		Springs		Lakes and ponds	
	Total	Dried out	Total	Dried out	Total	Dried out
2003	5 230	703	9 058	1 481	4 193	760
2007	5 121	831	9 340	2 096	2 820	1 039
2011	6 681	586	10 557	1 587	2 694	417
2013	6 131	394	11 061	1 009	2 988	341
2014	5 800	387	10 809	1 091	2 738	399
2015	6 122	328	11 667	1 102	3 233	495
2016	5 585	263	11 420	774	2 214	346

Source: Ministry of Environment and Tourism, 2017.

**Photo 9.1: Landscape in Selenge Aimag**

### *Surface water*

Most of the surface water resources are in the upper reaches of the large rivers of Siberia and the Far East, which flow towards the Arctic and Pacific Oceans. The largest rivers of the country are the Kherlen (1,213 km), Orkhon (1,124 km), Selenge (1,095 km), Tuul (898 km) and Zavkhan (808 km) Rivers (table 9.4). The Selenge River's basin area is the largest in Mongolia.

The rivers in the western and south-west parts of the country, flowing down from mountains, fall into the intermountain basins, cannot fall into the ocean and, as a rule, end in one of the lakes.

All Mongolian rivers freeze, most of them for 140–180 days each year, with ice to depths of 80–120 cm. In the low-lying plain areas, rivers thaw in April, but in the mountain regions, not until mid-May. As a result, Mongolia is heavily reliant on groundwater, and this resource is of particularly great economic significance to the country.

### Glaciers and permafrost

In Mongolia, there are about 262 glaciers, with a total surface area of 659 km<sup>2</sup>, which are distributed in 41 mountainous systems. As of 2016, the water resources of these glaciers are estimated at 19.40 billion m<sup>3</sup>, while in 1999, the volume of water stored in the glaciers was estimated at 63 billion m<sup>3</sup>.

**Table 9.4: Main rivers**

	Basin area (km <sup>2</sup> )	River length (km)	Mean basin elevation (m)	Total length of river network (km)
<b>Arctic Ocean Basin</b>				
Selenge	282 154	1 095	1 500	107 693
Ider	22 420	465	1 780	22 230
Delgermuren	18 671	440	1 921	8 002
Eg	38 354	510	1 624	13 551
Orkhon	131 106	1 124	1 300	85 870
Tuul	48 909	898	1 300	11 047
Kharaa	14 400	352	1 272	5 359
Eroo	10 905	388	1 320	5 735
Shishkhid	19 933	341	2 200	11 354
<b>Pacific Ocean Basin</b>				
Kherlen	107 040	1 213	1 071	11 793
Onon	27 998	570	1 090	12 756
Ulz	37 391	496	720	19 187
Khalkh gol	7 440	264	720	26 448
<b>Central Asian Internal Drainage Basin</b>				
Zavkhan	68 738	808	2 040	25 204
Tui	8 404	243	2 100	4 461
Ongi	16 028	435	1 650	5 274
Baidrag	18 226	310	2 191	..
Taats	6 701	200	1 760	1 599
Khovd	58 514	596	2 700	35 799
Tes	21 027	426	1 682	5 084
Khungui	32 821	196	1 860	6 660
Kharkhiraa	1 298	70	2 020	571
Turgen	1 136	94	1 720	1 103
Uench	3 215	132	1 780	421
Bodonch	6 068	167	1 425	3 917
Bulgan	9 853	268	2 180	6 713

Source: Integrated Water Management National Assessment Report, Ministry of Environment and Green Development, 2012.

Permafrost is found in the northern part of Mongolia.

### Lakes and ponds

In the early Quaternary Period, a considerable part of the territory of Mongolia was the inland sea that later divided into several large reservoirs. All that remained of them is the current lakes. The largest of the lakes are in the Great Lakes Depression in the north-west of the country – Lake Ubsu, Lake Khar and Lake Khyargas. Lake Buir and Lake Hoh are in the east of the country. Lake Khovsgol (depth up to 262 m) lies in a tectonic depression in the north of the Khangai Mountains range.

There are more than 1,000 permanent lakes in Mongolia and a much larger number of temporary ones. Six big lakes have a surface area exceeding 500 km<sup>2</sup>. In 2003, more than 4,000 lakes and ponds were recorded. This number dropped to 2,214 lakes in 2016.

### *Groundwater*

As regards renewable and exploitable groundwater resources, Mongolia has total potential exploitable groundwater resources of 10 billion m<sup>3</sup>/year or 42.34 per cent of the total annual renewable groundwater resources (23.644 billion m<sup>3</sup>).

## **9.2 Water quality**

### *Water quality classification*

According to the Mongolian National Standard for Water Quality of the Aquatic Environment (MNS 4586:1998), water sampling and analysis is carried out in 27 parameters. Surface-water quality is determined by physical characteristics (temperature, suspended solid particles and turbidity), chemical characteristics (nutrients, minerals, metals, oxygen, organic compounds and a wide range of pollutants) and biological characteristics, such as types and number of bacteria and algae.

The water classification was introduced in 2006. This method is used to assess the ecological state of water quality in Mongolia. It classifies the water quality in six categories. The Water Quality Index (WQI) describes the overall state of water quality from "very clean" ( $WQI \leq 0.3$ ) to "very dirty" ( $WQI \geq 6.0$ ) (table 9.5). The categories are defined based on analysis of 53 factors. The classes apply for surface, ground and drinking water.

According to the results of recent studies, the main sources of natural water resources pollution are municipal water treatment facilities, industrial treatment facilities, inadequately treated wastewater discharged from private and government-owned sanitation facilities and clogging by utility, industrial and household solid and liquid wastes. Therefore, ensuring the normal working condition of treatment facilities, introducing modern technologies and equipment and carrying out their regular maintenance are crucial for the reduction of environmental pollution and improvement of sanitary conditions. The main water pollutants are presented in table 9.6.

#### Drinking water

The quality of drinking water is regulated by the Mongolian National Drinking Water Standard (MNS 0900:2005). In 2013, water quality in more than 100 soums did not meet the drinking water quality standard since 60 per cent of the soums had water with too high

a level of total dissolved solids (TDS) and 40 per cent had a high hardness level.

#### Groundwater

Groundwater quality is classified according to the Water Quality Standard (MNS 4586:1998). Water quality standards are applied to groundwater depending on conditions of groundwater use; it can be the potable water standard, the standard for livestock water or the standard for irrigation water.

#### Impact on environment and human health

In general, one can characterize the surface water quality as good or excellent. Low mineralization, small amounts of nutrients and low temperatures often limit the biological productivity in flows and eutrophication process. In combination with the free flow of the rivers and natural distribution of habitats, conditions are created for specific biodiversity, with many endemic types, which must adapt to specific climatic conditions. The groundwater quality is, in most cases, suitable for human use, although many water-bearing layers, located in the western and southern part of the country, have high mineralization and sulphate content. These characteristics depend on the frequency of groundwater renewal and the nature of terrestrial rocks, and are not related to human activities.

**Table 9.5: Water quality index**

Water quality	Category	Index	Color identification
1	Very clean	$0 \leq 0.3$	Bright blue
2	Clean	0.31–0.89	Deep blue
3	Slightly polluted	0.90–2.49	Yellow
4	Polluted	2.50–3.99	Orange
5	Dirty	4.00–5.99	Green
6	Very dirty	$\geq 6.0$	Grey

Source: Ministry of Environment and Tourism, 2017.

**Table 9.6: Water pollutants by origin**

Water pollutants	Examples	Households	Industry
Biodegradable organic pollutants	Food remains, excreta	√	√
Persistent organic pollutants	Pesticides, solvents, polyvinyl chlorides, pharmaceuticals/medicines, hormones	√	√
Nutrients	Nitrogen, phosphorus	√	√
Heavy metals	As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sn, Tl		√
Solid particles; objects	Plastic, toilet paper, cans, tampons, hairs, condoms, twigs	√	√
Solid particles; sediment	Sand, silt, sludge, colloids	√	√
Pathogens	Bacteria, viruses	√	
Oil and grease	Oil, grease, fats	√	√
Salts	Sodium, chloride, sulphate		√

Source: Integrated Water Management National Assessment Report, Ministry of Environment and Green Development, 2012.

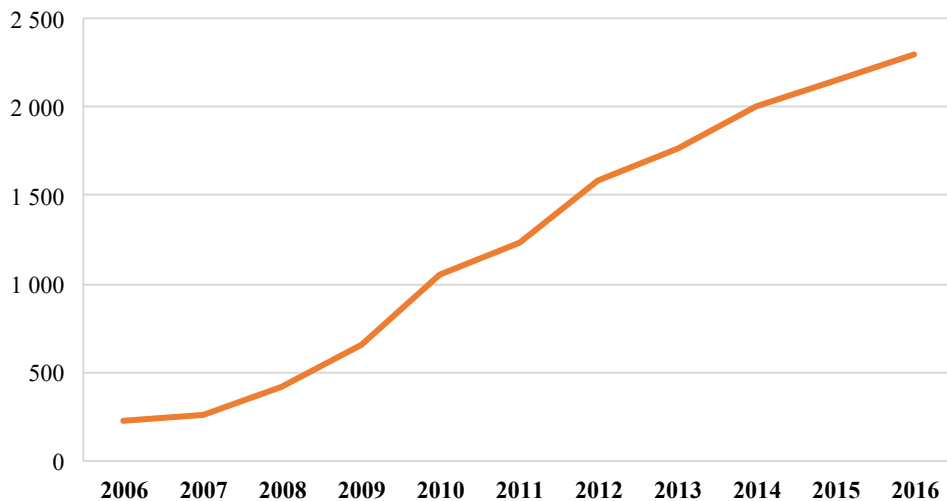
### Protection of water sources

In order to protect water supply sources, a number of areas with limited access to a watershed and limited conditions of land use/economic activities were designated as water protection zones. The water protection zones in Mongolia are also located along each river and theoretically provide a prohibition on human impact within a strip not less than 5 m from the bank, including a ban on cattle pasture. The width of the water protection strip depends on the river size. By 2016, 44.5 per cent of the total area of riverheads had been placed under national protection. The total number of protected springs reached 2,299 in 2016 (figure 9.1).

### 9.3 Water demand

In 2013, the demand for water in 2015 and 2021 was forecast according to the three scenarios of the country's development (low, medium and high), in accordance with the current governmental policies and strategic documents (table 9.7). The projected water demand under all these scenarios for 2015 and 2021 is higher than water resources used in 2010. Since, currently, most of the demand is satisfied with groundwater resources, utilization of the surface water resources is the way to increase water supply.

**Figure 9.1: Protected water springs, 2006–2016, number**



Source: Ministry of Environment and Tourism, 2017.

**Table 9.7: Water demand projections according to three development scenarios, million m<sup>3</sup>**

Sector	Sub-sector	2010	Projections					
			2015			2021		
			Low	Medium	High	Low	Medium	High
Domestic	Urban	51.9	66.4	70.9	78.6	67.2	72.9	81.8
	Rural	3.2	4.1	4.0	4.0	5.9	6.0	6.0
Agriculture	Livestock	76.9	90.2	94.9	109.4	103.1	108.6	117.3
	Irrigation	98.7	125.0	169.8	203.2	165.5	260.8	360.0
Industrial	Mining	41.5	52.5	81.1	103.5	61.8	111.1	187.8
	Heavy industries	1.3	1.6	1.8	2.3	2.0	2.7	4.7
	Manufacturing	3.6	4.4	5.1	6.6	5.6	7.6	13.5
	Construction	1.2	1.6	2.0	2.4	2.1	3.2	4.5
Energy	Power plants	33.4	37.8	44.7	54.3	43.9	63.5	97.3
Municipal	Commercial service	3.9	4.8	5.6	7.7	6.3	8.7	17.2
	Public services	5.5	5.8	5.9	6.7	6.0	6.5	8.5
	Green areas	2.5	2.6	2.6	2.7	2.7	2.9	3.0
Tourism		0.8	1.2	1.4	1.6	2.7	3.4	4.0
Roads, transport		2.7	3.2	3.6	4.1	4.1	4.5	5.0
<b>Total</b>		<b>327.1</b>	<b>401.2</b>	<b>493.4</b>	<b>587.1</b>	<b>478.9</b>	<b>662.4</b>	<b>910.6</b>

Source: Integrated Water Management Plan of Mongolia, 2013.



#### 9.4 Performance and gaps in water monitoring networks

##### *Surface water monitoring*

Surface water monitoring is the responsibility of NAMEM's Information and Research Institute of Meteorology, Hydrology and Environment, NAMEM's Departments of Meteorology, Hydrology and Environmental Monitoring in the aimags, NAMEM's laboratories in the aimags, and the Central Laboratory of Environment and Metrology and water basin administrations.

Monitoring of surface waters is carried out at 191 hydrological measuring stations on 94 rivers and 18 lakes. These stations belong to NAMEM. Within the national hydrological network, there are 24 monitoring points for the groundwater regime, 74 observation points for hydrobiological sampling, 142 observation points for water quality control and chemical selection and 127 points for water quality control and chemical selection. The parameters observed are major cations and anions, TDS, pH, O<sub>2</sub>, BOD and some trace metals.

##### *Groundwater monitoring*

Groundwater monitoring is conducted by the Ministry of Environment and Tourism, the Information and Research Institute of Meteorology, Hydrology and Environment, GASI, Mongolian University of Science and Technology, and water supply and private mining companies at an increasing number of sites.

With regard to groundwater, there are 287 approved water deposits/abstraction sites, 25 for drinking water and the remainder for industry/mining. There are 193 monitoring wells (boreholes), of which 28 are automated and continuously return data. Of these 28, 10 are operated by mining companies, three are for drinking water in Ulaanbaatar and two are at strategic mining sites. The remainder are manual and monitoring takes place once a month for drinking water and once per quarter for industrial use. There are more than 100 permafrost monitoring boreholes, which belong to several institutions and were established in different periods.

Due to the lack of monitoring points for the groundwater regime and the ongoing exploration of

new sources of groundwater, the network for monitoring groundwater requires significant strengthening.

##### *Wastewater control*

In the aimags, there are 40 output control points for wastewater located at 20 WWTPs. In Ulaanbaatar, there are 15 output and input control points (of which seven are output control points) located at seven WWTPs.

#### 9.5 Management of water use

Water use is estimated at 500 million m<sup>3</sup> per year, on average.

Until 2012, the amount of water used was estimated.

Since 2012, with the implementation of the revised 2012 Law on Water, water used and consumed is recorded on the basis of formal agreements between the authorities and customers, called "conclusions". In 2012, 97 conclusions were made with citizens, economic entities and organizations. This number reached 481 in 2016 (table 9.8). The number of conclusions for mining almost doubled in the same period (table 9.9). The amount of water used is measured either by water meters or as "free" recording, which is much higher than by a water meter. In 2012, water meters were installed at 19 enterprises and, in 2016, water meters were installed at 188 enterprises (an almost tenfold increase) (table 9.8).

Data on water abstraction show that 41.2 million m<sup>3</sup> were recorded as abstracted in 2012. The recorded water abstraction reached 168 million m<sup>3</sup> in 2016 (table 9.10). On average, for the period 2013–2016, 95.5 per cent of the water abstracted is from groundwater resources.

It is estimated that about 39 per cent of the water is used for industrial purposes (thermal energy, mining, light industry, construction), 24 per cent for animal husbandry, 18 per cent for irrigation, 18 per cent for drinking and domestic purposes and 1 per cent for other purposes (tourism, green development, roads) (figure 9.2).

**Table 9.8: Consumed water, conclusions and water meters, 2012–2016**

	2012	2013	2014	2015	2016
Used and consumed water (million m <sup>3</sup> )	41.2	71.6	96.9	172.3	168
Conclusions (number)	97	131	153	523	481
Water meters installed (number)	19	31	55	155	188

Source: Ministry of Environment and Tourism, 2017.

Note: Conclusions are formal agreements between the authorities and customers.

**Table 9.9: Citizens, business entities and organizations that concluded agreements for water use and consumption, 2012–2016, number**

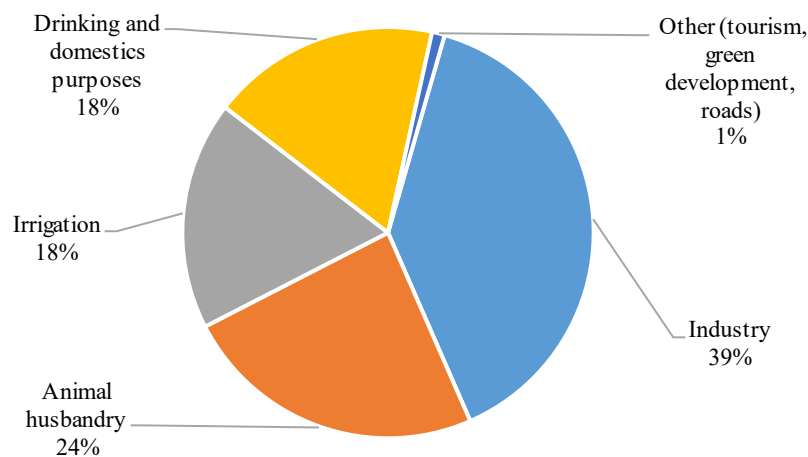
	2012	2013	2014	2015	2016
<b>Total, of which:</b>	<b>97</b>	<b>131</b>	<b>153</b>	<b>523</b>	<b>481</b>
Food production	3	2	1	24	20
Light industry	-	-	2	20	44
Heavy industry	-	-	-	1	1
Construction and construction material production	4	6	6	60	43
Energy	4	5	10	21	26
Mining industry, of which:					
Mining and processing	83	108	110	153	157
Exploration and drilling	-	-	-	69	76
Crops	1	-	-	29	12
Water supply	2	10	19	26	31
Social services	-	-	-	55	33
Travel and spa resort, of which:					
Tourist camp and resort	-	-	-	61	35
Spa resort	-	-	5	4	3

Source: Ministry of Environment and Tourism, 2017.

**Table 9.10: Recorded water abstraction, 2012–2016, million m<sup>3</sup>**

	2012	2013	2014	2015	2016
<b>Total</b>	<b>41.2</b>	<b>71.6</b>	<b>96.9</b>	<b>172.3</b>	<b>168</b>
Surface water	..	3.9	4.4	7.1	6.4
Groundwater	..	67.6	92.5	165.2	161.6

Source: State of the Environment Report 2015–2016, 2017, Ministry of Environment and Tourism.

**Figure 9.2: Water use by sector**

Source: Ministry of Environment and Tourism, 2017.

Note: Numbers are estimated.

Groundwater is the main source of water in Mongolia. Almost all social and economic sectors depend on the availability of groundwater for their activities. Livestock breeding uses water from the wells in the regions where there is no surface water; the agriculture sector uses the groundwater for irrigation and replenishment of water deficit; mines and industry use water for their processes. The reliable quality of the underground water makes it the most important source of drinking water. About 99 per cent of the population uses groundwater as drinking water and only about 1 per cent of the population uses surface water for this purpose.

#### *Agriculture*

Agriculture (animal husbandry and irrigation) is the largest water user in Mongolia. The agriculture sector mainly uses earth dams for irrigation. The earth dam of the Khaya irrigation system is the tallest at 36 m high (artificial lake volume is 3.9 million m<sup>3</sup>). When using surface water and groundwater for irrigation, surface and water-sprinkler methods and technologies are used widely.

#### *Industry*

Industrial utilization of water can be divided into groups, including consumer goods and food industries, heavy industry, mining, and construction and manufacturing of construction materials. Data on the actual utilization of water resources in these sectors are not available. However, it is possible to estimate the amount of water utilization on the basis of goods manufactured. Thus, utilization of water by the consumer goods and food industries is calculated on the basis of water quantity necessary to manufacture the product unit and the quantity of goods manufactured. According to the estimates, this industry group utilizes 0.8 million m<sup>3</sup> of water each year. Industry facilities located within the territory of Ulaanbaatar utilize 0.25–0.3 million m<sup>3</sup> of water annually.

In 2010, the leather industry used 0.1 million m<sup>3</sup> of water. The wool and cashmere industries used about 0.3 million m<sup>3</sup> of water in 2010. The leather, wool and cashmere industries use more than 30 chemicals for their processing, which causes serious water pollution. The leather, wool and cashmere industries in Ulaanbaatar use water from the central system and discharge the wastewater to USUG-operated Khargia WWTP or to the central WWTP. According to information by GASI, some industries producing wool and cashmere use compact WWTPs to treat industrial waste.

Khargia WWTP was built in 1972 based on the Soviet technology and its capacity was 13,000 m<sup>3</sup>/day for chemical and biological treatment. Later, the WWTP received only 7,000–8,000 m<sup>3</sup> of wastewater per day, but because of the weak technical and operating conditions of the facilities for preliminary treatment, it discharged crude wastewater directly to the central WWTP, thus causing pollution of the Tuul River, underground water and soil. In 2009, Khargia WWTP was reconstructed at public expense.

#### *Energy*

Hydropower potential is estimated at 5,700 MWh. Thermal power plants use water for cooling, while HPPs use water to produce power. The power sector uses a huge amount of water. In 2010, more than 30 million m<sup>3</sup> were used by the thermal power plants and about 1 billion m<sup>3</sup> by HPPs.

To produce electricity, Mongolia also uses HPPs (e.g. Durgun and Taishir HPPs) and micro-HPPs in some soums. HPPs are mainly located in the west of Mongolia, with a planned capacity from 100 kW to 300 MW. However, the main problem for hydropower is the fact that many rivers and dams freeze up in winter.

#### *Households*

##### Drinking water supply

Most water consumed is taken from underground sources. As a rule, drinking water is of a good quality and the capacity of existing systems is currently sufficient. However, the quality of water in certain aimags and soums does not comply with the drinking water standard. In addition, the infrastructure of centralized systems has significantly deteriorated and there is an urgent need for its modernization. The demand for water is constantly increasing, due to the rapid growth of the urban population and economy, which, in its turn, requires the creation of a new water infrastructure.

Drinking water sources and supply to the population are different in rural and urban areas. Big cities, aimag centres and large soum centres have centralized water supply networks. The urban areas consisting of gers, along with soum centres and rural areas, have decentralized sources of water supply, so water needs to be physically collected and brought to the home to be used (box 9.1).

**Box 9.1: Water collection: a gender perspective**

A survey of water collection in Mongolia showed that, in Ulaanbaatar, men made up the majority of water collectors across all forms of water collection, but were particularly prominent in water collection by vehicle and by animal. In other words, men and boys are much more likely to collect water when they can use mechanized transport such as bikes, scooters and trucks. In 70 per cent of urban households that collected water by vehicle, men were the sole collectors, and in urban households that used horses to collect water, only men performed this task. In rural Mongolian households in which water was collected by vehicle (mainly motorbike), men had sole responsibility for 48 per cent of water collection, and in households that collected water by hand, they had sole responsibility for 25 per cent of water collection.

The involvement of Mongolian men in water collection may point to greater gender equality in Mongolia than in other countries, where it is often seen as shameful for men to participate in this task. The survey findings also indicate that women are most often charged with deciding when to collect more water for the family. Nevertheless, this gender equality does not translate into more opportunities for women to participate in local or regional decision-making on water management.

*Source:* R. Hawkins and J. Seager, "Gender and water in Mongolia", *The Professional Geographer*, vol. 62, No. 1 (2010), p. 16–31; UNEP, *Global Gender and Environment Outlook*, 2016.

**Photo 9.2: A boy fetching water in Khailaast bagh, Zaamar Soum**



The water supply system of Ulaanbaatar, managed by the Ulaanbaatar Water Supply and Sewerage Authority (USUG), includes six water sources, six pump stations for water transfer, 175 deep wells, 320 kiosks connected to the centralized system, 305 unconnected kiosks, 59 water trucks, 586 km of water pipes, 147.7 sewer pipes and 172 km of water supply lines to areas with gers. It provides drinking water to a population in the capital of about 1.3 million population and 4,500 industries and business entities.

Twenty-one aimag centres and some other cities have centralized water supply and sewerage systems, served by aimag public urban services organizations (PUSOs). Decentralized water supply kiosks, located in urban and settlement areas with gers, usually have a well with the electric pump, as well as a small house with the water tank.

### Daily water consumption

Daily water consumption by the population living in apartments in the cities is 200–350 litres per person. In 2016, daily water consumption by an apartment resident in Ulaanbaatar was 150 litres per person per day (table 9.11). Daily water consumption by inhabitants of territories with gers, as well as rural dwellers, is only 5–10 litres per person on average, which is less than half of the minimum recommended by WHO. By 2012, 49.2 per cent of housing and communal service authorities were equipped with water meters, whereas practically 100 per cent of water supply and sewerage authorities were.

### Access to water supply and sanitation and the Millennium Development Goals

The Government has been making steady progress towards improving access to water supply and sanitation during the last 10–15 years. The official data for access to water supply and sanitation and the related MDGs, however, vary between different sources.

According to the United Nations MDG database, under Indicator 7.8 on access to an improved drinking water source, there was a 9 per cent improvement in the period 1990–2015, from 53 per cent of the population in 1990 to 64 per cent in 2015 (table 9.12). Most of the increased access was in rural areas (an increase of 168 per cent), while there was a surprising decrease of 14 per cent in urban areas. Similarly, under Indicator 7.9 on using an improved sanitation facility, there was an increase of 30.4 per cent in the same period, from 46 per cent in 1990 to 60 per cent in 2015, with a 1.5 per cent increase in urban areas and a 104.7 per cent increase in rural areas.

The Mongolian nationalized (adapted) MDG on Proportion of population without access to safe drinking water sources shows a decrease by 39 per cent, from 45 per cent in 1990 to 27.41 per cent in 2010, against the target of 40 per cent set for 2015. The Mongolian nationalized MDG on Proportion of population without access to improved sanitation facilities shows a decrease by only 0.8 per cent, from 77.40 per cent to 76.80 per cent in the same period, against the target of 60 per cent set for 2015. The official values for Mongolian (nationalized) MDGs achieved by the year 2015 are not available.

According to the 2013 Integrated Water Management Plan, in 2010, 86.7 per cent of urban areas were supplied from protected water sources, but only 43.5 per cent of rural areas (table 9.13). On sanitation, 37.7 per cent of the population in urban areas had adequate sanitation and 30.2 per cent had access to the central sewerage system in 2010. In rural areas, the percentage of the population having adequate sanitation is not known and estimated to be less than 5 per cent.

According to USUG, the proportion of the population getting safe drinking water in Ulaanbaatar increased from 94.5 per cent in 2005 to 95.2 per cent in 2015.

**Table 9.11: Water consumption in Ulaanbaatar, 2012–2016**

<b>Water consumption</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Daily water consumption of apartment resident (litre)	200	189.7	167.8	156.3	150
Daily water consumption for ger district resident using water from pipe connected water kiosk (litre)	8.3	8.9	7.7	8.1	8.1
Daily water consumption for ger district resident using water from truck supplied water kiosk (litre)	7	7.7	7.4	7.9	7.3
Non-revenue water (per cent)	19.2	17.4	14.1	13.9	..

Source: Ulaanbaatar Water Supply and Sewerage Authority (USUG), 2017.

**Table 9.12: Water-related MDG indicators, 1990, 2000, 2010, 2015, per cent**

	1990	2000	2010	2015	Target 2015
Global MDGs on water <sup>1)</sup>					
<b>7.8 Proportion of population using an improved drinking water source, total *</b>	<b>53</b>	<b>56</b>	<b>63</b>	<b>64</b>	
Proportion of the population using improved drinking water sources, urban	77	74	69	66	
Proportion of the population using improved drinking water sources, rural	22	32	50	59	
<b>7.9 Proportion of population using an improved sanitation facility, total **</b>	<b>46</b>	<b>48</b>	<b>57</b>	<b>60</b>	
Proportion of the population using improved sanitation facilities, urban	65	65	66	66	
Proportion of the population using improved sanitation facilities, rural	21	26	37	43	
Mongolian (nationalized) MDGs on water <sup>2)</sup>					
<b>Proportion of population without access to safe drinking water sources</b>	<b>45.00</b>	<b>33.81</b>	<b>27.41</b>		<b>40.00</b>
<b>Proportion of population without access to improved sanitation facilities</b>	<b>77.40</b>	<b>77.00</b>	<b>76.80</b>		<b>60.00</b>

Source: 1) United Nations Statistics Division. Millennium Development Goals Indicators (<http://mdgs.un.org/unsd/mdg/default.aspx>); 2) Achieving the Millennium Development Goals, Fifth National Progress Report, 2013.

Note: \* Percentage of de jure population whose main source of drinking water is a household connection (piped), public tap or standpipe, tubewell or borehole, protected dug well, protected spring, rainwater collection or bottled water.

\*\* Percentage of de jure population whose household has a flush toilet, ventilated improved pit latrine, pit latrine with a slab, or composting toilet and does not share this facility with other households.

**Table 9.13: Access to safe drinking water and adequate sanitation, 2010**

	%
<b>Urban areas</b>	
Supplied from protected water source	86.7
Having private water supply connection	32.9
Having adequate sanitation	37.7
With private connection to central sewerage system	30.2
<b>Rural areas</b>	
Supplied from protected water source	43.5
Having adequate sanitation	< 5

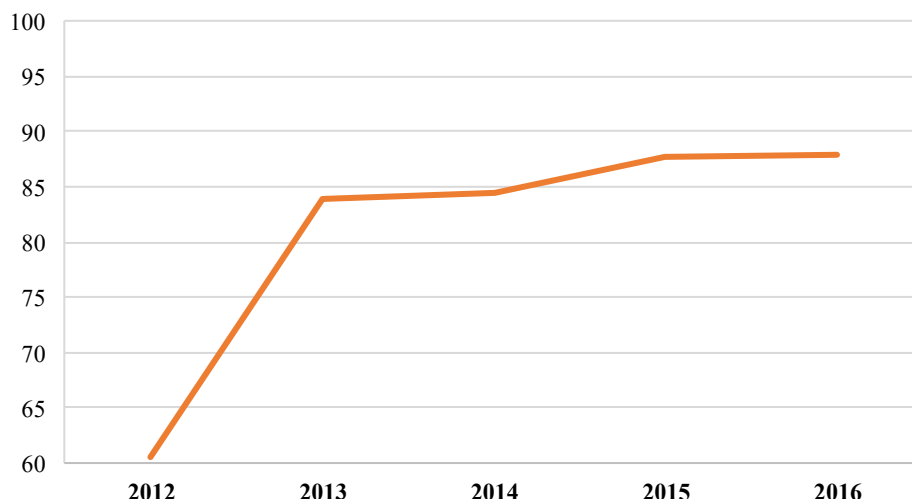
Source: Integrated Water Management Plan of Mongolia, 2013.

### Wastewater treatment

On average, 200 million m<sup>3</sup> of wastewater is transported by the public sewerage system annually. Untreated wastewater is dumped into the environment, causing surface and groundwater contamination. Treated wastewater increased from 60 million m<sup>3</sup> (30 per cent) in 2012 to almost 88 million m<sup>3</sup> (44 per cent) in 2016 (figure 9.3).

Some WWTPs in big cities, aimag centres and soum centres are operating under PUSOs. Most water

supply and water disposal networks were created during the period 1960–1990, and now they are rather outdated, which interferes with reliable operation. As of 2015, there were 125 WWTPs, of which 51 were functioning, 47 not working and 27 partially functioning. Most WWTPs are concentrated in the central part of the country. WWTPs treat both household wastewater and industrial discharges. Most of the WWTPs do not have their own laboratory to perform wastewater analysis.

**Figure 9.3: Treated wastewater, 2012–2016, million m<sup>3</sup>**

Source: Ministry of Environment and Tourism, 2017.

Technologies used in industrial WWTPs usually represent a combination of mechanical and biological treatment, consisting of aeration, sedimentation and chlorination. The water treated in such a way is discharged into the municipal WWTPs. The capacity of municipal WWTPs ranges from the small plants processing several hundreds of m<sup>3</sup> per day, to the large treatment plants processing 16,000 m<sup>3</sup> per day (Darkhan) and even 160,000 m<sup>3</sup> (Ulaanbaatar) per day. The capacity of WWTPs in aimags is usually from 1,000 to 5,000 m<sup>3</sup> per day.

The lack of financial resources causes delays in repair, maintenance, restoration and reconstruction of WWTPs. Sewage treatment in aimag centres and in industry has decreased; the volume of treated wastewater discharged directly into the environment has decreased accordingly. The work of WWTPs in rural areas and remote locations has ceased, due to the lack of professional organizations and personnel needed for their operation.

As of 2017, there is no standard on sludge withdrawal and treatment in Mongolia. In practice, sludge treatment is as follows: if a small amount of sludge is formed after wastewater treatment, it is pre-dehydrated and dug into the sites specially prepared for this, which should meet certain requirements. If a large amount of sludge is formed, treatment in oxygen and an oxygen-free environment is carried out for destructive oxidation.

#### *Tourism*

Tourism is crucial for the country's economy. This is particularly true for tourism complexes, where the water supply and wastewater disposal systems shall conform to the international standards as much as

possible. The use of small water supply and water disposal systems is recommended, depending on location. IWRM plans do not include small water supply and wastewater disposal facilities related to tourism activities.

#### *Floods*

There are more than 100 km of dams and 84.2 km of channels in Mongolia, in total. As of 2010, there were 42 km of anti-flooding concrete dams, 56 km of river protective dams, 9.8 km of earth dams, 3.5 km of dams with an inner stone layer, six settling tanks catching flood water and road rain water (three with a capacity of 9,800–10,300 m<sup>3</sup> and three with a capacity of 200–250 m<sup>3</sup>). There are 18 collectors that discharge groundwater and 70 km of water-collecting underground pipes.

The anti-flooding infrastructure of Ulaanbaatar is in a deteriorated condition. The unplanned settlement areas, especially ger districts, have expanded without due consideration to anti-flooding protection measures (chapter 14).

### **9.6 River basin management**

The revised 2012 Law on Water is based on the IWRM approach, including river basin management. The concept of IWRM was adopted in Mongolia in order to improve planning and ensure coordination in the use of water resources. The Law on Water requires developing a comprehensive plan of water resources management for Mongolia and for each water basin. Mongolia has 29 river basins (annex IV, map 2).

Implementation of the IWRM approach started with establishment of two types of organizations involved

in water resources management at the basin level – water basin administrations and water basin councils.

In 2013, 25 water basin administrations were created. Several of them were further dismantled/integrated. Therefore, in 2017, there are 21 water basin administrations. Water basin administrations are responsible for the protection of water resources from scarcity and pollution and for effective uses and habitat restoration, providing the coordination with local and intersectoral levels, developing and implementing the water basin management plan.

Water basin councils are established in order to develop water basin management plans, as well as supervise their implementation. A water basin council is an NGO and has 31–45 members, one third of whom represent public administration and parliaments, one third represent NGOs and local communities and one third represent water users (industrial and agricultural sectors).

As of mid-2017, water basin management plans were approved for 17 basins, were under development in six basins and were at the initial stage of development in six basins.

Despite the success achieved in introducing IWRM, there are still a lot of challenges. Water basin councils were formally established in many basins but do not operate because of problems with their financing. The challenges for integrated management also include deforestation in the basins of some rivers (e.g. Tuul River basin) and excessive livestock pasture in some basins. Further tasks ahead include exploration of new sources of groundwater, establishing a sound network for monitoring groundwater, and reduction of the impact of poorly functioning facilities for water treatment. Vocational training and professional development of employees of the water basin authorities (both water basin administrations and water basin councils) is also very important.

### **9.7 Impact from and adaptation to climate change**

According to forecasts, climate change will cause a rise in temperature, melting of glaciers, water deficiency and desertification. Due to its geographical location, Mongolia is rather sensitive to climate change, so the average annual air temperature increased by 2.1°C in the period between 1940 and 2008. Hundreds of lakes, rivers and streams dried up because of droughts. Snow cover of the high mountains has decreased by 30 per cent in the period between 1992 and 2002.

The adaptation vision for the water resources sector, as included in Mongolia's 2015 INDC, envisages the expansion of the state SPAs to cover river headwater areas and the strengthening of IWRM in river basins (chapter 7). Specific adaptation activities include construction of reservoirs for glacier-melt water harvesting and regulation of river streams and flows, introduction of water saving and water treatment technologies, and introduction of effective drip irrigation technologies in arable farming.

## **9.8 Legal, policy and institutional framework**

### *Legal framework*

The main legislative act in the area of water resources utilization is the Law on Water, first adopted in 1995 and issued in a revised version in 2012. It provides for the classification of water resources and establishes responsibilities for rational water management and the procedure for issuing permits for water use. It regulates the relations between water use and exploration. Subsidiary legislation has been adopted to define water basins, provide guidance on developing water basin management plans and set up water basin administrations and water basin councils (chapter 1).

The 2012 Law on Water and the 2011 Law on Use of Water Supply and Sewerage System in Urban and Settlement Areas establish the general legal framework for water supply and sewerage tariffs (chapter 3). Such tariffs are set by the Water Services Regulatory Commission established on the basis of the 2011 Law.

Water pollution charges are based on the 2012 Law on Water and the 2012 Law on Water Pollution Fees; however, secondary legislation for the implementation of water pollution fees has yet to be adopted (chapter 3).

The 2009 Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas prohibits the issuance of exploration and exploitation licences for run-off source areas.

### *Policy framework*

The national strategies and programmes include several important objectives and targets with regard to the water supply and sanitation sector and IWRM. However, they are short on detail of how these targets will be reached, including specific responsibilities and financing strategies.



### Water National Programme

The 2010 Water National Programme (2010 Resolution of the State Great Khural No. 24) is implemented in two stages: the first phase of intensive development in the period 2010–2015 and the second phase of stable development in the period 2016–2021. The strategic goals of the Programme are to intensify water resources management, regulate the effectiveness of water resources utilization, improve the legal environment of water resources management, as well as to promote the effectiveness of water resources management. The results of the monitoring and assessment carried out with regard to the Programme's implementation indicate that 68 per cent of activities envisaged to be undertaken in 2015 were implemented, whereas the overall implementation rate by that year was about 40 per cent.

### National Integrated Water Resources Management Plan

The National Integrated Water Resources Management Plan of Mongolia (2013 Government Resolution No. 389) is the main water resources management instrument. It defines measures and implementing organizations under five main objectives:

- Provision of safe water to the population;
- Providing the agricultural sector with the necessary water supply;
- Providing the industrial and mining sectors with the necessary water supply;
- Maintaining environmental balance and protecting water resources;
- Optimal water management and intersectoral coordination, including monitoring and public participation.

Measures indicated in the Plan specify aimags and soums, implementing organizations, sources of financing and timeline.

### Mongolia Sustainable Development Vision 2030

The 2016 Mongolia Sustainable Development Vision 2030 – the main national development document – recognizes IWRM as the key area for achievement of one of its four pillars: environmental sustainability.

The document foresees several water-related objectives:

- Build by 2020 at least two national-level large water tanks to collect waters from precipitation and surface flows;
- Implement by 2025 complex water projects on water preservation from large rivers such as the Kherlen, Orkhon and Selenge Rivers and build more water tanks to store surface waters;
- Place at least 60 per cent of water resources, river streams and water sources under special protection by 2030;
- Draw a medium-scale hydrogeological map for 30 per cent of the territory by 2030;
- Ensure that 90 per cent of the population is supplied with safe drinking water and 60 per cent of the population uses improved sanitation and hygiene facilities, by 2030.

### Other

Other relevant policy documents include the 2008 National Programme on Safe Drinking Water Supply (2008 Government Resolution No. 84, no longer valid) and the 2012 Khatan Tuul National Programme and Action Plan (2012 Government Resolution No. 203) (chapter 1).

### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis selected targets of Goal 6 of the 2030 Agenda for Sustainable Development is described in box 9.2.

### *Institutional framework*

From 1938 to 1986, the Ministry of Water was responsible for policymaking in the water sector. In the 1990s, water resources management was performed by six ministries: the Ministry of Nature and Environment, Ministry of Food and Agriculture (agricultural water supply), Ministry of Construction and Urban Development (municipal water supply and wastewater), Ministry of Health (water hygiene), Ministry of Energy (hydro energy) and Ministry of Defence. In 1999, the first National Water Committee was established with the aim to define and implement the state policy on water and to reconcile water relations between sectors.

In 2012, the organizational structure of the water sector was significantly changed due to the government restructuring. Currently, the primary responsibility for water resources rests with the Ministry of Environment and Tourism, specifically, the Land Management and Water Policy Coordination Department, which consists of two divisions (figure 1.2). The main tasks of the Water Resources Division

are protection of water resources, survey of groundwater resources, increasing surface water resources, enlarging the national water monitoring network and implementation of IWRM. The River Basin Management Division coordinates the activities of the 21 water basin administrations in charge of 29 water basins.

The main tasks of water basin administrations are to issue water use permits for the central water supply bodies and for water users and entities for the use of more than 100 m<sup>3</sup> of water, and wastewater discharge permits for water polluters that discharge more than 50 m<sup>3</sup> per day (table 2.1).



### Box 9.2: Selected targets under Goal 6 of the 2030 Agenda for Sustainable Development

#### **Goal 6: Ensure availability and sustainable management of water and sanitation for all**

Despite Mongolia having begun successful implementation of IWRM, Goal 6 remains of the utmost importance for the country. Nowadays, Mongolia possesses the main legal and policy framework for water resources management and has developed an organizational structure, but needs more efficient practical implementation, owing to insufficient institutional collaboration and lack of investment.

#### **Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all**

According to the United Nations MDG database, 64 per cent of the Mongolian population had access to an improved drinking water source in 2015, but the differences in access between urban areas and rural areas persisted (table 9.12). Target 6.1 of the 2030 Agenda therefore remains highly relevant for Mongolia. It is important that, in SDV 2030, Mongolia has already set the target for the 2030 horizon: to have 90 per cent of the population supplied with safe drinking water. This target needs to be further localized to address urban–rural and regional disparities.

#### **Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations**

According to the United Nations MDG database, 60 per cent of the Mongolian population used an improved sanitation facility in 2015 (table 9.12). According to the 2013 National IWRM Plan, in 2010, 37.7 per cent of the population in urban areas had adequate sanitation, while less than 5 per cent of the population in rural areas did so (table 9.13).

Open defecation is still practised in Mongolia. Nationwide estimates of the population practising open defecation range between 10 and 15 per cent. According to WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), open defecation rates are over 26 per cent in the poorest rural areas of Mongolia.

In SDV 2030, Mongolia has set the target on improved sanitation and hygiene, aiming to achieve 60 per cent population coverage with improved sanitation and hygiene facilities by 2030. Mongolia has not set a specific target to end open defecation. Strategic documents in Mongolia are not taking specific account of the needs of women and girls and those in vulnerable situations.

#### **Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally**

One of the objectives of the 2013 National IWRM Plan is to cut down the quantity of untreated wastewater. However, the document does not specify the quantitative target on untreated wastewater. Envisaged measures include renovation and expansion of sewerage networks, renovation of existing WWTPs and expansion of coverage by WWTPs.

There is a scarcity of information on investments in municipal infrastructure such as waste collection and disposal and water supply and sewerage services, notably wastewater treatment. On the condition that there is a sufficient level of investment in wastewater purification infrastructure, most probably, the objective to halve the quantity of untreated wastewater can be reached.

#### **Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate**

As of mid-2017, basin management plans were approved for 17 of the 29 basins. The water basin administrations and water basin councils have a sufficient level of the powers necessary for IWRM planning and implementation. At the same time, there is a lack of the practical experience and qualified staff required for successful implementation of basin management plans.

The transboundary aspect of Target 6.5 is addressed in box 6.4.

Water basin councils are responsible for enabling public participation in water resources planning, implementation and monitoring of water use and pollution; submitting proposals for the suspension of water use permits; and advising water basin administrations on development and implementation of water basin management plans.

GASI bears the main responsibility for inspection and enforcement of the environmental legislation, including on water issues. GASI inspectors control water resources utilization.

Environmental authorities at aimag level (i.e. aimag environmental and tourism departments) are responsible for monitoring the implementation of the Law on Water and creation of the water database of aimags and the capital city. They are also responsible for approval of water basin administrations' contracts with customers who consume 50–100 m<sup>3</sup> per day (table 2.1).

The aimag khural (parliament) adopts management programmes submitted by the water basins councils and governors. The khural bears responsibility for the implementation of water legislation at the aimag and soum levels.

Soum governors are responsible for issuing water use permits for consumption of less than 50 m<sup>3</sup> per day (table 2.1).

Aimag and soum governments are responsible for protection against floods in the respective territory.

The public company "Mongol Us" is responsible for implementation of water policies defined by various ministries, monitoring of groundwater resources, and supervision of construction and management of water sources and wastewater treatment infrastructure outside Ulaanbaatar that is financed from the state budget.

The Ulaanbaatar Water Supply and Sewerage Authority (USUG) supplies water to about 1.3 million people and 4,500 industries and other entities in the capital. It is responsible for related water and sewerage infrastructure. In addition to managing the centralized water supply, USUG services the residents of ger districts of Ulaanbaatar through more than 550 kiosks that are either connected to central water pipes or are serviced by water trucks.

In aimag centres and other cities, water supply is provided by aimag PUSOs.

The "Hydro Construction" Company is responsible for flood protection works.

### *Regulatory and economic instruments*

#### Permitting and environmental impact assessment

Regardless of one's status (water consumer or water user), it is necessary to apply to the state authorities to obtain permits for water use. Depending on the amount of water needed for the water consumer or water user, different authorities participate in the permitting process (table 2.1). A permit for water use shall be issued for the period of 10 years with the possibility of extension for another five years. For the use of more than 100 m<sup>3</sup> of water per day, the applicant shall separately submit an EIA report.

#### Water service fee

Water consumers and water users pay a water service fee to the appropriate water supplier. The majority of water consumers, who have water meters, pay the service fee for water actually used.

#### Water use fee (water abstraction fee)

The revised 2012 Law on Water classifies individuals and legal entities as water users and water consumers according to the purposes for which the water is needed. Water consumers are citizens, business entities and organizations that use water or a water environment for non-commercial purposes such as drinking, domestic needs, animal breeding and agriculture. Water users are those who use water or a water environment to receive income in the industrial and services sectors.

Water users pay the fee for water use, while water consumers are exempted from such a fee but are charged a service fee for water transportation and distribution. The water use fee is calculated as a percentage of the ecological and economic value of water in a certain water basin. The Tuul River basin has the highest base values for both surface water and groundwater. Aimag authorities bear the responsibility for setting the water use fee. The revenues are paid to the local government budget, which should spend 35 per cent of these revenues on water management and protection, but this does not happen in practice (chapter 3).

#### Water pollution fee

The 2012 Law on Water Pollution Fees introduced charges for pollution of water. The secondary

legislation for implementation of this fee has yet to be adopted (chapter 3).

#### *Participation in bilateral agreements*

Mongolia shares 243 transboundary water bodies. Mongolia has signed two agreements that regulate bilateral cooperation on the use and protection of transboundary water bodies (chapter 6): the 1995 Agreement on the Protection and Utilization of Transboundary Waters with the Russian Federation and the 1994 Agreement on the Protection and Utilization of Transboundary Waters with the People's Republic of China. No trilateral cooperation activities on transboundary waters take place.

### **9.9 Assessment, conclusions and recommendations**

#### *Assessment*

The Government established the priorities for water management in the 2010 National Water Programme and 2016 Mongolia Sustainable Development Vision 2030. Much attention is paid to revising and extending the legislative and regulatory frameworks; targeted programmes and different projects are being developed within these frameworks. Achievements include placing 44.5 per cent of the total area of river heads under national protection by 2016 and the prohibition of mineral exploration and exploitation in run-off source areas, introduced in 2009.

However, despite existing legal and regulatory acts and programmes, water resources management remains one of the most problematic issues in Mongolia, especially in the context of climatic conditions and social and economic consequences.

Mongolia identified the IWRM approach as a priority direction for reforming its water management system. However, practical implementation of IWRM lags behind, with the need to develop IWRM plans for the remaining basins, ensure implementation of IWRM basin plans, strengthen the institutional structures for IWRM implementation, ensure the operation of water basin councils and advance opportunities for public participation in water basin management.

The main sources of water pollution are municipal water treatment facilities, industrial treatment facilities and poorly treated wastewater discharged from private and government-owned sanitation facilities. Ensuring proper working conditions in treatment facilities, introducing modern technologies and equipment and carrying out their regular maintenance are crucial for the reduction of

environmental pollution and improvement of sanitary conditions.

#### *Conclusions and recommendations*

##### Water supply, sanitation and wastewater treatment infrastructure

The Government has been making steady progress towards improving access to water supply and sanitation in the last 10–15 years. It has nationalized the MDGs and has set new targets on access to water supply and sanitation under the Mongolia Sustainable Development Vision 2030. The official data for access to water supply and sanitation and the related MDG indicators vary between different sources. The clear gaps, however, are the persistent differences in access to both water supply and sanitation between urban and rural areas, the limited number of households having connection to central sewerage systems in urban areas and the very low percentage of the rural population (less than 5 per cent) estimated to have access to adequate sanitation. Open defecation is still practised and, according to JMP, open defecation rates are over 26 per cent in the poorest rural areas. Additional efforts are therefore needed for Mongolia to achieve Targets 6.1 and 6.2 of the 2030 Agenda for Sustainable Development.

Target 6.3 of the 2030 Agenda for Sustainable Development (By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally) is crucial for Mongolia, where wastewater treatment represents one of the biggest challenges for the protection of water quality. Due to the capacity and the technical state of the existing wastewater treatment facilities, the quality and the efficiency of wastewater treatment should be improved.

##### Recommendation 9.1:

*The Government should increase investments in:*

- (a) *Water supply, sanitation and sewerage infrastructure, with a focus on rural areas;*
- (b) *The renovation of the central wastewater treatment plant in Ulaanbaatar.*

##### Groundwater and surface water use

About 95 per cent of the water used in Mongolia is supplied from groundwater resources, which amount to only 1.91 per cent of the total volume of Mongolia's water resources. Surface water resources are

unequally distributed throughout the country's territory and are used to a limited extent. There is no comprehensive water infrastructure to increase the use of surface water resources.

Recommendation 9.2:

*The Ministry of Environment and Tourism, in cooperation with the Ministry of Construction and Urban Development and other relevant government bodies, should:*

- (a) *Develop an action plan to shift from the use of groundwater to the use of the surface water resources for various purposes;*
- (b) *Ensure development and financing of water infrastructure in order to accumulate water resources and provide all sectors with water;*
- (c) *Consider developing and implementing aquifer recharge schemes in both urban areas and the relevant regions of the Gobi Desert.*

Groundwater monitoring

Monitoring is the important constituent of water resources management in Mongolia, which certainly needs further development. This is especially true for groundwater monitoring. There are 193 monitoring wells (boreholes), of which just 28 are automated and continuously return data.

Recommendation 9.3:

*The Ministry of Environment and Tourism should increase the number of groundwater monitoring system logger points (boreholes) with the purposes of improving water quality and usage and not lowering the groundwater levels.*

River basin management and databases

Mongolia has established 21 water basin administrations for its 29 water basins. These bodies are entrusted with a comprehensive set of tasks – to develop basin IWRM plans, ensure intersectoral coordination in their implementation, set up databases of water basin information and monitor water use in the basin. However, these bodies lack the practical experience needed for implementation of these tasks. Training and professional development of employees of the water basin authorities are of the utmost importance, to enable them to implement the assigned tasks and be better positioned for advancing implementation of Target 6.5 of the 2030 Agenda for Sustainable Development (By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate).

Recommendation 9.4:

*The Ministry of Environment and Tourism should:*

- (a) *Provide training and professional development in order to improve the water resources management capacity of the river basin authorities' staff;*
- (b) *Seek assistance from international organizations and other governments that have adequate experience and knowledge in IWRM plans;*
- (c) *Ensure the operational consistency of the water databases for data collection, data quality and data exchange between data holders and organizations;*
- (d) *Create and maintain the national water database and subdatabase of water basin information.*

## Chapter 10

# WASTE MANAGEMENT

### 10.1 Practices and trends in waste management

#### *Municipal solid waste*

Municipal solid waste (MSW) generation in urban areas of Mongolia was estimated from data provided by the Municipality of Ulaanbaatar. These estimates indicate that citizens of Ulaanbaatar currently generate about 360 kg of household waste per person per year. This is a sharp increase compared with the period 1996–2010 when reported MSW was stable at around 200 kg per person per year. Additional waste is generated from street cleaning (about 300 t/d), resulting in total MSW generation of 430 kg per person per year.

The waste data of the Municipality of Ulaanbaatar also include waste collected by municipal companies from companies (legal entities) amounting to 1,400 t per day. According to international practice, commercial waste reported under municipal waste includes waste from shops, restaurants, offices and other municipal infrastructure. The practice in Mongolia is different. In this category is also reported manufacturing waste similar to MSW (waste from food and beverage production, textiles, leather, furs etc.), which should be reported separately as manufacturing (or industrial) waste. Therefore, this category of waste was excluded from estimation of MSW generation and was used for estimation of manufacturing waste generation. The total generation of household, commercial and manufacturing waste in Ulaanbaatar exceeds 1 million t/y.

These latest data differ from estimates prepared by JICA based on 2010 waste data. JICA estimates expected a large increase in waste from ger districts during the winter months, because of ash from local coal heating. Updated figures show practically the same waste generation from ger districts in summer and winter, because a lot of waste generated by ger residents in winter is used as fuel. In contrast, analysis of monthly data in 2013–2014 shows peaks of waste generation during the summer months, which is attributed to commercial activities, mainly construction activities and services.

Households in rural areas generate only very small amounts of waste. Traditional nomadic lifestyle in open plains in fact follows the zero-waste approach.

However, concentration of nomadic people around cities is causing significant infrastructure challenges, including waste collection and disposal.

National statistics on waste are based on collected waste. MSW is on an increasing trend, but this reflects the combined impact of increasing capacity of municipal services to collect waste, improving quality of reporting, collection companies' interest in securing funding for their operations and an actual increase in generated waste because of the improving quality of life.

Data for the period 1996–2001 were estimated in m<sup>3</sup> and weighbridges were installed on the three main disposal sites in 2006–2007. Data for the period 2002–2004 are not available. Data from the Ministry of Environment and Tourism were reviewed, revised (replacing outliers by estimates) and reorganized to comply with international standards (table 10.1). These data are available since 2005, but only data from 2012 show a certain stability and may reflect the real situation in waste management in Mongolia. There is high uncertainty of data, because of the lack of data verification procedures. Additionally, as well as receiving user fees, collection companies receive a subsidy from the municipality, which is based on the amount of waste collected and distance to the disposal site. Disposal site operators do not collect a gate fee but receive a subsidy based on the amount of waste received. These subsidies motivate operators to report higher waste amounts and longer distances, to obtain additional funds.

The composition of solid waste in Ulaanbaatar, as identified by several studies, is presented in table 10.2. These analyses show varying results, but were prepared by different methods and at different times. The first two analyses, for 2004 and 2007, were prepared by analysing municipal waste at the container stand and combining it with an estimation of ash generation in ger areas. These characterize generated municipal waste at the district level. Composition of waste generated by individual households was studied by Delgermaa and Matsumoto in 2016 on a sample of 18 households for two weeks. Sampling was done directly in the household, and this is the reason for the high share of food waste. Commercial waste, street sweepings and ash were not included in this analysis. Composition of waste as

delivered to a disposal site was analysed by Batbileg et al. and the EcoPark Feasibility Study in 2016. These show comparable results, differing only in metals fraction, because the EcoPark study also included waste separation and recycling data.

The data on waste composition were recalculated to present municipal waste in Ulaanbaatar in comparable waste fractions. Construction waste is normally found in MSW in a share lower than 1 or 2 per cent; therefore, it was excluded from data reported by Batbileg et al. and the EcoPark Feasibility Study in 2016.

### Collection

Regular MSW collection services in Mongolia are concentrating on urban areas. Overall waste collection

coverage is assumed to be 70 per cent in urban areas and 40 per cent in rural areas. Waste collection coverage in Ulaanbaatar is estimated to be 90–95 per cent.

Collection is provided directly by municipally owned companies or is subcontracted to private companies. Typically, several companies or units of municipal companies serve a town. In 2015, there were 23 collection companies/units with around 250 vehicles operating in Ulaanbaatar. The total number of vehicles used for MSW collection in Mongolia was 773 in 2015. The high number of companies indicates that the waste service market is in the early stage of development. Modern waste management recommends that a city is served by one company.

**Table 10.1: Municipal solid waste collection, 2005–2016, t/y**

	Mongolia				Ulaanbaatar			
	Total	Apartments	Ger districts	Street waste and other	Total	Apartments	Ger districts	Street waste and other
2005	41	12	19	10	..	..	..	..
2006	557 832	86 563	418 428	52 841	..	..	..	..
2007	8 996	2 584	5 914	498	..	..	..	..
2008	347 081	131 630	186 186	29 266	226 310	103 907	111 814	10 590
2009	554 211	177 806	288 319	88 086	263 424	119 580	121 500	22 344
2010	774 029	236 052	426 481	111 496	241 873	107 803	125 921	8 149
2011	899 323	274 450	503 075	121 798	440 556	180 778	251 625	8 153
2012	1 258 501	290 048	718 747	249 706	484 255	166 975	265 981	51 299
2013	1 815 356	414 013	1 027 616	373 727	771 547	300 610	439 910	31 028
2014	1 441 655	342 606	840 170	258 879	581 535	169 493	306 038	106 004
2015	1 608 909	359 332	1 026 600	222 978	614 859	148 169	370 645	96 045
2016	1 710 909	361 395	1 113 331	236 182	684 000	146 300	402 400	135 300

Source: Ministry of Environment and Tourism, 2017.

**Table 10.2: Municipal solid waste composition, per cent**

Waste fraction	Arendal, 2004		JICA, 2007		Delgermaa and Matsumoto, 2016	Batbileg et al., 2016	EcoPark, 2016
	Summer	Winter	Summer	Winter	Year	Year	Year
Food waste	36	23	34	13	74	26	26
Plastic	22	14	15	8	3	7	5
Paper	22	13	19	5	3	13	9
Glass	9	-	11	5	4	3	3
Metal	7	-	4	2	0	1	10
Textile	4	1	5	2	-	1	1
Ash	-	49	-	60	-	8	6
Other	-	-	13	5	15	41	40

Source: UNEP/GRID-Arendal, 2004; JICA, 2007; Delgermaa, G. and Matsumoto, T. (2016). A Study of Waste Management of Households in Ulaanbaatar Based on Questionnaire Surveys, 2016; Batbileg, T., Sambuu-Yondon, M. and Purev, B. (2016). Feasibility study on municipal waste management in Mongolia. Waste Management & Research, June 2016; EcoPark Feasibility Study 2016.

The system of MSW collection differs by type of residential area, but is manual labour intensive and time consuming, because containers suitable for automatic lifting are practically not used. High-rise buildings are equipped with waste chutes, and bunkers beneath them are often emptied manually. Ger districts and low-rise buildings are typically served by vehicles, which slowly move through the ger and stop at agreed places. These vehicles play a loud melody to alert the citizens in the area to bring their waste for collection. Additionally, these areas may have an agreed point where waste is accumulated prior to collection; such a point may be equipped with a large container (4–5 m<sup>3</sup>) or several smaller containers, or it may be an open area or walled area.

A collection vehicle in Ulaanbaatar can serve about 100 premises (clients) per day. For comparison, MSW collection companies in Europe can serve about 1,000 premises per day. This system of collection, although it is not effective, reflects the potential of Mongolian waste collection services. Specialized collection vehicles are often second-hand vehicles from various sources and there is a lack of spare parts to maintain them, especially their hydraulic lifting systems. In addition, there are no producers of waste containers in Mongolia able to produce containers in large numbers.

A wide range of vehicles is used for MSW collection, from specialized garbage trucks with a capacity of 5–6 tons to standard tipping trucks (figure 10.1).

Ash generated as a result of local heating in ger districts is accumulated in 200-litre drums in the

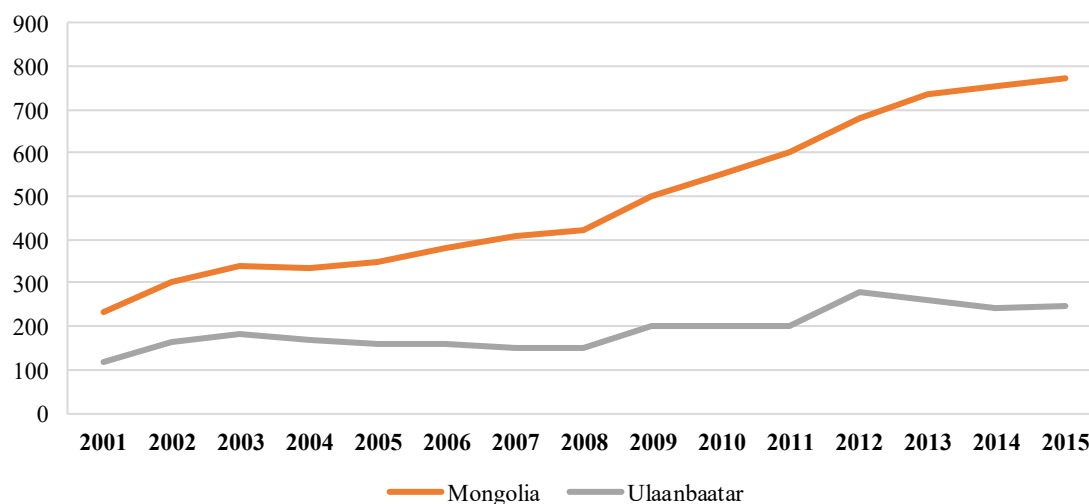
winter and transported to one of the municipal disposal sites. During summer, when ash is generated from cooking activities, it is disposed of together with other MSW. A 2007 JICA study estimated a high generation of ash in the ger districts in the winter (0.63 kg/person/day), but this was not conformed by later data.

### Disposal

MSW is disposed of in dumpsites, which are located near to residential areas. These sites were created randomly, and only later did municipal authorities begin to declare official disposal sites. Data on official and illegal disposal sites and their estimated area are available from 2005. There are about 400 official disposal sites covering 3,500–4,500 ha in Mongolia. The number of illegal dumpsites is hard to estimate, but during the last decade (2006–2016), more than 4,000 illegal sites covering 500,000 ha were cleaned and 1.1 million tons of illegally disposed of waste were transferred to official disposal sites.

Disposal sites receive municipal, industrial and hazardous waste. Fires on disposal sites are occurring because of disposed ash, and it was a practice to reduce accumulated waste. The general ban on open burning of waste introduced in the 2012 Law on Waste was supplemented by a ban on burning waste on disposal sites in the 2017 Law on Waste Management. The Ministry of Environment and Tourism expects that this measure will reduce fires at disposal sites.

**Figure 10.1: Vehicles used in waste collection, 2001–2015, number**



Source: National Statistics Office, 2017.



**Photo 10.1: Dumpsite in Ulaanbaatar**

A disposal site that operates close to international standards is the Narangiin Enger disposal site, located about 5 km north of Ulaanbaatar. The site was developed under the 2004 JICA project. The other two large disposal sites accepting waste from Ulaanbaatar are Morin Davaa and Tsagan Davaa. These three sites

are equipped with weighbridges and receive about 3,200 t/d of waste from six central districts of Ulaanbaatar. Table 10.3 shows the only data available on waste disposal in these three disposal sites. The remaining three satellite districts of Ulaanbaatar have each their own dumpsite.

**Table 10.3: Waste disposed in the three main disposal sites of Ulaanbaatar, 2013–2016, t/y**

Site	2013	2014	2015	2016
Narangiin Enger	591 991	557 962	455 427	429 262
Morin Davaa	105 608	152 920	157 198	163 845
Tsagan Davaa	401 796	380 596	356 533	395 285

Source: 2013–2014 data: Environmental Resources Management Foundation, Japan, Baseline Study Report, 2015; 2015–2016 data: Urban Landscaping Department of Ulaanbaatar City.

The recycling of municipal waste in Mongolia is basic by international standards. Recycling is focused on high-value wastes such as metals, plastics, paper and cardboard and there is limited domestic reprocessing capacity for some of this material. The majority of separated waste is exported, mainly to the People's Republic of China.

There were attempts to introduce separation at source. However, the population can sell separated recyclables to buy-out points. Thus, voluntary schemes, which are typical for waste systems in Europe, cannot compete with buy-out points and have only limited success in Mongolia. In addition, voluntary schemes are targeted by scavengers, decreasing the positive effects of voluntary separation at source.

Separation of recyclables operates on several levels in Mongolia. First, households are sorting out recyclables for sale, and then caretakers in apartment blocks check for recyclables in waste. Second, collection crews put aside some recyclables and sell them to buy-out points on the way to the disposal site. Third, scavengers on the disposal sites are collecting recyclables. There are about 200 regular scavengers in Ulaanbaatar alone and estimates indicate that they recover about 10 tons of recyclables per day.

A sorting plant was developed in the Narangiin Enger disposal site with Korean support in 2014. The plant receives 50–70 t/d of mixed household waste from apartment areas. Due to the lack of insulation, the plant cannot operate during the winter months and the current throughput is estimated at 20,000 t/y. The original plan to produce refuse-derived fuel had to be abandoned due to the lack of a local market; currently,

the plant sorts out plastics, paper and glass. The plant employs 33 people and operates in one shift. The sorting plant is regularly subsidized by the Municipality of Ulaanbaatar, because the sale of recyclables does not cover operation expenses. The plant operates at a financial loss and is largely subsidized by the municipality.

Enhancing the capacity to process separated recyclables is important in Mongolia because of the high level of imports of goods. A barrier for further strengthening of recyclables processing is the export of recyclables; thus, local companies must compete with exports. The annual capacity of recycling in Ulaanbaatar alone in 2015 was 87,600 t of metals in six plants, 200,000 t of aluminium alloys in three plants, 120,000 t of plastics in five plants, 1,000 t of paper in four plants, and an additional two waste tyre and used oil processing plants, a bracketing plant and a glass processing plant.

The Ministry of Environment and Tourism collects data on separately collected waste and actually recycled waste (table 10.4). These data are not related to the data on waste collection and disposal, as waste may be separated at source, thus not entering the waste collection system, and waste may be separated at a disposal site.

A complex waste management facility, EcoPark, is planned for Ulaanbaatar in the Narangiin Enger and Tsagaan Davaa areas. The Mongolian National Association of Waste Recycling Industries and the Office of the Mayor of Ulaanbaatar City started activities on development of EcoPark for waste recycling. In May 2017, the financing of EcoPark was secured.

**Table 10.4: Separate collection and recycling, 2008–2016, t/y**

	Paper		Glass		Aluminium		Metal scraps		Plastic	
	Separated	Recycled	Separated	Recycled	Separated	Recycled	Separated	Recycled	Separated	Recycled
2008	855	..	136	..	64	..	476 307	..	532	356
2009	20 598	9	4 131	1	923	7	2 544	732	20 539	77
2010	43 282	40	6 053	102	103	5	1 206	779	15 196	317
2011	32 429	31	17 355	66	1 388	1 317	9 948	7 264	23 081	12 743
2012	9 432	717	3 734	710	131	17	301 845	300 617	5 223	2 939
2013	168 849	22	55 187	4 111	3 875	2 271	30 494	1 120	177 394	4 132
2014	91 340	21	66 654	34	984	56	134 084	1 371	17 802	318
2015	136 526	18	41 309	1 395	1 687	59	116 414	932	121 536	861
2016	127 292	15 029	51 974	1 709	5 371	31	141 341	120 848	93 076	49 084

Source: Ministry of Environment and Tourism, 2017.

### Manufacturing waste

In 2016, the manufacturing sector represents only about 7.25 per cent of the GDP of Mongolia, compared with 11.68 per cent for agriculture and 20.09 per cent for the mining sector. The main sectors of manufacturing are production of food products and beverages, manufacturing of textiles, clothes, leather and fur, manufacturing of coke and refined petroleum products and manufacturing of basic metals and other non-metallic mineral products. Waste from the production of food products and beverages and the manufacturing of textiles, clothes, leather and fur is similar to municipal waste and is mostly disposed of on municipal disposal sites. Waste from the manufacturing of coke and refined petroleum products and the manufacturing of basic metals and other non-metallic mineral products is disposed of to dedicated sites within or near company territory. Information on manufacturing waste stored on these sites is not available.

A summary of statistical information on waste collected from legal entities is available from the EIC (figure 10.2). Companies transport waste to disposal sites in their own vehicles or using contracted municipal services. Detailed information on the types of manufacturing waste is not available.

### Waste from energy sector

More than 90 per cent of energy in Mongolia is produced from coal. Ash, the main waste generated from coal-burning power plants amounts to 10–30 per

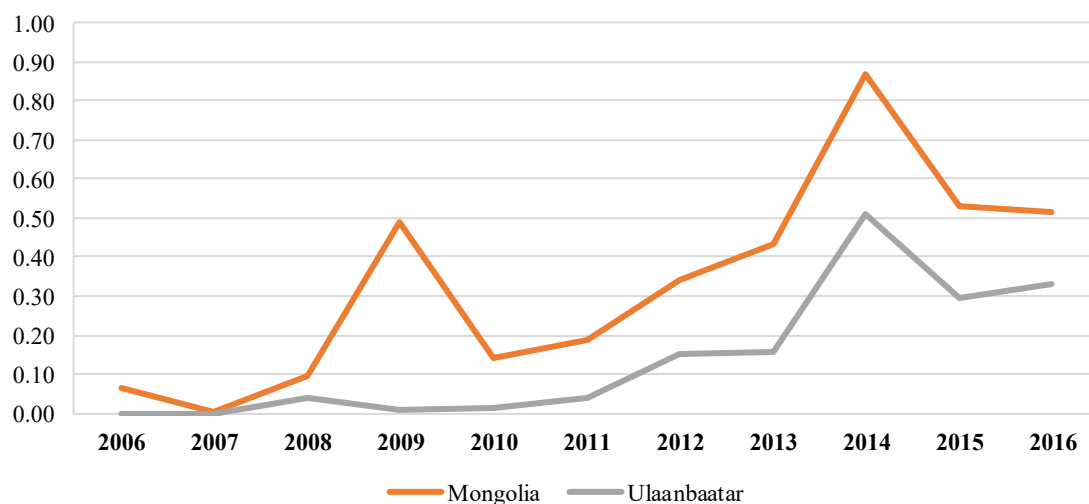
cent of burned coal. Ash is stored in ash ponds, to which it is transported as slurry. Ash ponds in Mongolia are constructed according to Russian standards.

Ulaanbaatar covers its demand for electricity and heat using three CHP plants (CHP-2, 21.5 MW; CHP-3, 198 MW; CHP-4, 700 MW). A fourth plant (CHP-5, 450 MW) is under preparation and should replace CHP-3. Smaller CHP plants are located in Darkhan (48 MW), Choibalsan (36 MW), Erdenet (28.8 MW) and Dalanzadgad (6 MW).

Each CHP has its own series of ash ponds. The ash ponds are not located adjacent to the CHP, but at distances up to several km away. The generation of bottom ash and fly ash from energy generation in Mongolia is estimated to be 600,000 t/y; CHP-4 alone contributes about 300,000 t/y.

Information on the amount of ash already deposited in ash ponds or the annual generation of ash is not available. The situation regarding ash ponds in the Ulaanbaatar area is as follows: CHP-2 ash pond had reached its capacity and cannot accept more boiler ash in the long run; CHP-3 ash pond has capacity of 1.5 million m<sup>3</sup> and can receive waste until 2024; CHP-4 is constructing its fourth ash pond, but it has small capacity for urgent reclamation over two years. The previously used third ash pond of CHP-4 had capacity for six years. CHP-4 is investigating using ash as a road construction material and fireproof material for the interior of boilers.

**Figure 10.2: Manufacturing waste collected from legal entities, 2006–2016, million t/y**



Source: Environmental Information Centre, 2017.

*Construction and demolition waste*

The construction industry is booming in Mongolia, particularly in Ulaanbaatar. Apart from new construction, the Municipality of Ulaanbaatar is planning to demolish a considerable number of old buildings. It is estimated that construction waste accounts for 20–25 per cent of all solid waste produced in Mongolia.

A lot of this construction waste was and still is dumped illegally. Construction companies do not have any proper inventory systems to classify the different types of waste or waste-separation arrangements. However, the amount of construction waste delivered to disposal sites is growing (table 10.5).

**Table 10.5: Construction waste disposal, 2006–2016, t/y**

	Mongolia	Ulaanbaatar
2006	33 113	..
2007	..	..
2008	2 314	..
2009	48 236	11 306
2010	38 637	7 455
2011	98 072	15 150
2012	77 943	..
2013	182 249	92 831
2014	93 508	..
2015	133 107	87 467
2016	119 187	80 800

Source: Ministry of Environment and Tourism, 2017.

The project Supporting a Greener and More Energy-efficient Construction Sector in Mongolia, and the ongoing project Improving Resource Efficiency and Cleaner Production in the Mongolian Construction Sector Through Materials Recovery, are part of the SWITCH-Asia programme, which is funded by the EU. The first project focused on recycling fly ash from heating plants as an additive to construction products, including their certification as an eco-friendly product, and was implemented in the period 2012–2016. More than 15 construction materials producers have already applied the technology of using ash in their production. The second is a four-year project, which is due for completion in 2020 and aims to green the waste supply chain from design through to demolition. The project will also work on developing products made of recycled materials, from their design to marketing strategies and labelling to ensure quality and foster trust. Cooperating with the Government of Mongolia, large real estate developers and construction companies, the project also aims to encourage new regulations on construction and demolition waste reduction.

*Mining and quarrying waste*

Mining is a key sector of the Mongolian economy. In 2016, it accounted for 20.09 per cent of GDP. There are 400 large mining companies in Mongolia. Mining is typically done in open pits; thus, large amounts of soil/earth are moved to access the minerals. Extraction of metals from ores is done by flotation, resulting in large amounts of tailings. ASSM is a specific type of mining activity. Although its impact on the environment is small compared with large mining projects, it is much more difficult to regulate and control.

Gold mines have a relatively short operation time. Closure of a gold mine is done according to an approved rehabilitation plan and, after rehabilitation, the land should be returned to its previous use. Attention is given to rehabilitation of stockpiles by covering them with topsoil and planting grass, trees and bushes.

All mines must prepare an annual environmental management plan that addresses the impact of mining activities on the environment (chapter 2). It also includes information on waste management. Summary information characterizing waste management and land rehabilitation in the mining sector is not available. Box 10.1 provides a few examples of waste management in the mining sector.

Information on the environmental impact of artisanal mining activities is limited. The 2007 SoER identified 120 illegal gold extraction sites. These illegal activities generated 203,500 m<sup>3</sup> of tailings and 53.5 ha of land contaminated by mercury.

*Agricultural waste*

Agriculture is the second major contributor to Mongolia's GDP after mining. In 2016, it accounted for 11.68 per cent of GDP. Waste from agriculture is not considered a problem, mainly because the prevailing style of animal farming is herding. Large farms dating from the socialist period, which were the main source of agricultural waste problems, disappeared during the transformation of the agricultural sector. New farms, which are developed now, pay proper attention to waste, e.g. a chicken farm in Ulaanbaatar treats chicken manure in an anaerobic reactor, generating heat, and processed manure is used as fertilizer. In the rural areas, animal waste is traditionally used as fertilizer and dried cow dung is used as fuel in gers.

Specific statistical data on agricultural waste are not available.

**Box 10.1: Waste management in the mining sector**

The Erdenet Mining Corporation is the largest copper–molybdenum mine in Asia. It began operations in 1978. At present, it is processing 26 million t of ore, producing 530,000 t of copper concentrate and 4,500 t of molybdenum concentrates annually. Each year, 10–12 million t of subgrade ore are added to the existing stockpile. The waste from ore processing is pumped to a tailing pond, which contained 400 million t of mine tailings, as well as 15 million m<sup>3</sup> of water in 2006. When completed, the tailing pond will contain over 1 billion t of tailings, making it one of the largest tailing ponds existing today. The company has been conducting rehabilitation at the site of bare rock heap No. 3, open-pit mine, since 2007, turfing over an 18 ha area and planting over 15,000 trees and bushes.

The Shariin Gol coal deposit is an open-pit mine, which began operations in 1965. The mine occupies an area of 580 ha, comprises one open pit and one large and several smaller waste rock piles, and has a current production of about 800,000 t/y. Waste rock is produced at a rate of 4.5 million m<sup>3</sup> per year. The waste is dumped in the immediate vicinity of the open pit. Waste rock piles contain 210 million m<sup>3</sup> of overburden.

The Baganuur coal mine covers an area of 1,700 ha. From 1978 to 2001, approximately 162 million m<sup>3</sup> of waste rock were removed from the pits. Some 103 million m<sup>3</sup> were used as backfill in mined-out areas, and 59 million m<sup>3</sup> were deposited outside the pits. As a result of the 1995 EIA's recommendations, in 2000, the mine started the rehabilitation of waste rock piles. This entails flattening the slopes and revegetation by seeding grass. By 2001, an area of nearly 61 ha of waste rock has been contoured and 46 ha have been seeded.

The Boroo Gold Company was mining for gold from 2004 until 2006, processing around 2.5 million t of ore annually. The company implemented a land rehabilitation plan and restored 264 ha by 2010.

The Oyu Tolgoi mine is a new operation, which started to produce copper concentrate in 2013. The mine is processing 70,000 t of ore per day; full capacity is planned of 140,000 t of ore per day in 2021. Waste rock stockpiled or placed in dumps is subject to segregation of potentially acid-forming materials from non-acid-forming materials. The company developed the Interim Waste Management Centre for safe disposal of waste from mine construction, later replaced by the Waste Management Centre for waste from mine operations. The Waste Management Centre is operated by the company Element LLC and includes an incinerator, landfill and temporary storage. A Land Disturbance Control and Rehabilitation Management Plan and associated Biological Rehabilitation Procedure for Oyu Tolgoi mine was developed.

*Hazardous waste*

Information on hazardous waste is limited. Although hazardous waste management legislation was adopted, it has not been well enforced and, as a result, appropriate treatment and disposal remains a problem.

The currently known main sources of hazardous waste in Mongolia are sludge from tanneries, waste from processing and use of crude oil and soil containing cyanide and mercury from gold ore processing. Additionally, there are banned chemicals and acids from recycling of car batteries. Information on the amounts and types of hazardous waste is not collected regularly. Available results of a preliminary inventory of hazardous waste carried out by the Ministry of Environment and Tourism in Ulaanbaatar in 2009 are shown in table 10.6.

It is estimated that about 27,000–54,000 t of hazardous waste is generated annually throughout the country.

Hazardous wastes that have a market value, such as waste oils, are used locally to produce fuel or are possibly exported to be reused or refined. Since 2012, the challenges increased significantly because, until then, hazardous waste was, for the most part, exported to other countries, namely, South Korea. However, in 2012, China banned the transit of hazardous waste,

which had already been banned by the Russian Federation, and since then Mongolia ceased to export hazardous waste. There is no installed capacity for the recycling or recovery of chemical wastes and therefore the majority of hazardous waste is sent to disposal sites in Ulaanbaatar.

**Table 10.6: Hazardous waste in Ulaanbaatar, 2009, t**

Treatment/disposal method	Hazardous waste
Incineration	7 994
Recycling	1 354
Landfill	998
Physical-chemical treatment	455
<b>Total</b>	<b>10 801</b>

Source: Environmental Information Centre, 2017.

According to the Ministry of Environment and Tourism, over 20,000 t of chemicals have been imported in 2007 and 134 companies have been permitted to import, sell and use chemicals in that year. Due to the lack of border control, the illegal import of chemicals increased in recent years. Illegal storage facilities for chemicals have been identified by NEMA and the National Police Agency and the chemicals found were confiscated. NEMA stores part

of the hazardous waste found during the inventory undertaken in schools and unsecured areas.

Two nationwide inspection campaigns aimed at mercury and sodium cyanide use in gold extraction in mining have been carried out during 2007–2008. These inspections revealed 53 ha of land and dozens of wells polluted by mercury and cyanide and about 200,000 t of sludge and waste materials in 120 places in 10 aimags. During these inspections, 145 grinding mills that used mercury were closed.

The Ministry of Environment and Tourism, in cooperation with the National Police Agency, confiscated 17 kg of mercury and handed it to NEMA for neutralization. The Ministry, NEMA and GASI have organized decontamination of chemical spills and pollution during 2008–2009 and created four hazardous waste sites in the most polluted areas. These sites now contain 197,687 t of neutralized sludge. The Government has spent 3.7 billion tugriks on this decontamination.

A feasibility study of a hazardous waste treatment facility was carried out in 2009. This study planned the development of an incineration plant, a physico-chemical treatment plant and solidification plant for liquid waste, landfill, sterilization of medical waste and an analytical laboratory. No decisions have been taken on investment in a hazardous waste treatment facility.

#### *Healthcare waste*

Healthcare waste management is undergoing a transformation, which is well advanced in Ulaanbaatar but lags behind in other parts of Mongolia.

The old practice of each hospital having an individual solution to healthcare waste disposal was abandoned in Ulaanbaatar by developing a central healthcare waste treatment facility. Since 2011, this facility, located outside Ulaanbaatar at the border of the Narangiin Enger disposal site, has been operated by the company Element LLC. It operates under a public–private partnership agreement between Ulaanbaatar City, the Ministry of Health and Element

LLC. Although the agreement has a duration of only five years, it includes a clause ensuring automatic extension of the contract.

Element LLC collects medical waste from all public and private healthcare facilities in Ulaanbaatar City on a routine basis and, after autoclave disinfection, disposes of this waste in the Narangiin Enger disposal site. The facility consists of two autoclave units for biological waste and one unit for needles and sharps, with a total capacity of 2,800 kg/d. The amount of healthcare waste treated by Element LLC is shown in table 10.7. These figures are substantially higher than the previous estimate of healthcare waste generation for Ulaanbaatar, prepared in 2005, which expected 781 kg of healthcare waste daily or 285 t/y.

As well as operating the healthcare waste management facility in Ulaanbaatar, Element LLC operates a similar facility in Uvs Aimag and prepared a feasibility study for improvement of medical waste management in the Nalaikh District of Ulaanbaatar. As of August 2017, no decision had been taken on a new healthcare waste management facility in Nalaikh.

The situation regarding healthcare waste management in hospitals in other parts of Mongolia is not known in detail. A national assessment on healthcare waste management was conducted in 2006–2007. It showed that 90 per cent of the facilities are burning medical waste in small, low temperature incinerators without any air filter or are practising open burning. By 2011, 33 per cent of aimag hospitals and 41 per cent of soum hospitals had shifted to non-incineration technology for healthcare waste treatment. Sterilized waste is then sent to local disposal sites. Hospitals are using pits for biological waste located on the hospital territory.

International organizations provided high-pressure steam autoclaves and trained personnel in 28 soum hospitals in nine aimags with WHO support, 35 soum hospitals in 10 aimags with Millennium Challenge Account–Mongolia support, and 90 soum hospitals and five aimag hospitals with ADB support, in 2009–2011. The total budget of this assistance was US\$1 million.

**Table 10.7: Treated healthcare waste in Ulaanbaatar, 2011–2016, t/y**

2011	2012	2013	2014	2015	2016
589	..	750	796	863	945

Source: Element LLC, 2017.

**Photo 10.2: Vehicles transporting healthcare waste to the central healthcare waste treatment facility outside Ulaanbaatar**



In addition, to improve healthcare waste management in Darkhan and Erdenet, the Government allocated a budget of US\$90,000 for procurement of the same equipment in 2009 as for the Ulaanbaatar healthcare waste treatment facility. The latter was installed at the City Central Hospital and started its operation by treating healthcare waste. In 2011, the Government allocated US\$60,000 for healthcare waste management in the city hospital and three remote district hospitals in Khovd Aimag.

The Fifth Health Sector Development Project, financed by the ADB, started in 2012 and will end in 2018. It aims to establish an interim storage facility for medical waste in six aimag general hospitals and in Darkhan and Erdenet, provide waste management equipment to 21 hospitals and improve medical waste management systems and build personnel capacity nationwide. As of March 2017, the Ministry of Health awarded a civil works contract to establish an interim waste storage facility in two of a total of eight general hospitals. Supply and installation of medical waste management equipment in the project hospitals has not yet started, due to delays in renovation works in the hospitals. The project made progress in improving the country's legal and administrative system for medical waste management. Based on a review of the current related policy documents, the project consultants provided recommendations for

improvement and reinforcement of the legal documents.

#### *Radioactive waste*

Mongolia is a non-nuclear country; there are no nuclear power plants or research reactors. Radiation sources and radioactive substances are used in medicine (radiotherapy and diagnostics), veterinary medicine, geology and mining and in science, research and education. The amount of generated radioactive waste is low and mostly it is from spent sources. These are stored in the Isotope Centre (box 10.2).

An area contaminated by Sr-90 was found in Ulaanbaatar in 1993. The area was decontaminated and the soil removed. The waste soil was sealed in 93 drums and was placed in the Isotope Centre, where six storage cells were built for this purpose.

The Ministry of Environment and Tourism recognizes that radioactive waste management can be improved. Requirements to re-export spent sealed sources to the supplier are not enacted, and therefore not enforced. There is no national radioactive waste management programme. In addition, the capacity of the existing radioactive waste storage is not sufficient for future needs.

### Box 10.2: Isotope Centre

The Isotope Centre was established in 1982. It is currently subordinated to the Nuclear Energy Commission. The Centre is located about 25 km from Ulaanbaatar. The activities of the Centre are to centrally store, transport and dispose of radiation sources and radioactive material and radioactive waste. The Isotope Centre has two storage facilities. The first storage facility has 12 storage wells for low activity waste and spent sealed sources. The second storage facility has six wells. It is designed for storage of high activity and long-lived radioactive solid sealed sources, such as Co-60, Cs-137, Pu-Be and Ra-226.

The Isotope Centre also conducts the transportation of radioactive sources within Mongolia, including transport of spent sources from the user to the long-term storage facility of the Centre. Transportation of radioactive substances does not seem to be a significant problem in Mongolia. All radioactive sources are imported.

The Isotope Centre lacks capacity for conditioning of spent sealed sources and radioactive waste, because the Centre does not actually have any conditioning equipment.

The State-owned company MonAtom plans to develop Mongolia's first nuclear power plant by 2020 and build nuclear fuel production capacity. Although these plans are at an early stage, they may result in an urgent need to increase Mongolia's capacity to regulate and manage radioactive waste.

#### *Persistent organic pollutants waste*

##### Pesticides

Mongolia first used pesticides in 1958, in animal husbandry. Hexachlorocyclohexane (HCH) in various forms was imported from the Soviet Union until 1985. HCH was used as an insecticide to control livestock ectoparasites and to disinfect animal shelters. In 1990, the ministries responsible for environment, food and agriculture banned the use of HCH 12 per cent mixture powder by joint order, which was the first ever ban on the use of a pesticide in Mongolia. However, some soums continued to use HCH until 2000.

As well as HCH, other POP pesticides were also used from 1969 to 2003: Hexachlorobenzene, Chlordane, Aldrin, Dieldrin and Heptachlor.

An inventory of POPs was carried out in 2005–2006 under the first GEF/UNIDO POPs Enabling Activities Project. Small amounts of Aldrin, Chlordane, Dieldrin and Hexachlorobenzene were used during the period 1958–2003 for plant protection. According to information in the inventory on HCH congeners and lindane, 5 t of HCH are stored in Hovd Soum, Hovd Aimag, over 10 t TMTD-80 (80 per cent tetramethylthiuram disulfide) in Arvaiheer Soum, Uvurhangai Aimag, and 108.3 litres of Chinmix (2.5 per cent concentrate) at the Ulaanbaatar Railway Customs Bond Yard. All the substances are being stored under inappropriate conditions. In the 1980s, various pesticides (name and volume uncertain) were dumped into a burrow in Amgalan, Bayanzurh District, Ulaanbaatar City.

According to the 2014 inventory of obsolete chemicals and pesticides, 369 t and 69,000 l of outdated chemicals and pesticides are stored in the premises of 297 companies in 139 soums of 21 aimags. It is estimated that 55.6 per cent of these products are stored in workplaces, 25.4 per cent in inappropriate storage facilities and 2.6 per cent in open areas.

The Ministry of Environment and Tourism is planning to perform a detailed survey of sites contaminated with POPs and other pesticides in every aimag and soum by 2020. Complete disposal of obsolete pesticides is expected to be completed by 2024 and contaminated land to be cleaned by 2030.

##### PCBs

A preliminary inventory of PCBs was conducted in 2005 and detailed inventory has been ongoing since 2009, involving electrical equipment with insulating oil. Presently, Mongolia limits its activities towards the reduction of PCBs only with closed applications, specifically, PCBs in insulating oil in electrical equipment.

The 2005–2006 inventory identified PCB-containing oils in equipment amounting to 5,518.3 t, of which 2595.4 t was in transformers, 2472.7 t in breakers, 7.5 t in capacitors and the remaining 442.7 t in other equipment. The majority of the fluids are used by the energy sector. Geographically, 97 per cent of this equipment is located in the central region. The inventory also revealed that about 8 per cent of all equipment contained oil with a concentration of more than 50 ppm PCBs. These are 188 transformers, 66 breakers and two waste oil tanks, with a total weight of 663.6 t and 207.1 t of oil.

The project Non-combustion Decontamination Technology for Equipment Containing PCB Oil: Capacity-building for Environmentally Sound PCBs Management and Disposal is funded by the United Nations Industrial Development Organization



(UNIDO) and started in 2013. Decontamination of oil and equipment containing PCBs is done with CDP (continuous closed loop dehalogenation) technology. Until now, 800 t of PCB-containing equipment were treated by CDP technology, which is near the target of 1,000 t. All equipment containing oil with a concentration of more than 50 ppm PCB is expected to be decontaminated by 2020.

#### *Specific waste streams*

Mongolia does not have management plans or strategies for specific waste streams. The EcoPark Feasibility Study provides analysis of specific waste streams, and can be used as a baseline for the preparation of management plans.

National statistics, from either the NSO or the EIC, show a big difference between the amounts of separated recyclables and recycled amounts in Mongolia. The majority of recyclables are exported to the People's Republic of China and the Republic of Korea.

#### Organic waste

Organic waste includes kitchen waste and garden waste and its generation is estimated to be 350,000 t/y in Ulaanbaatar. Mongolia has not yet introduced any programmes for reduction of organic waste and all organic waste is disposed of.

#### Waste bones

Nine million livestock were slaughtered in Mongolia in 2014 and this corresponds to generation of 77,000 t of bone waste. In Ulaanbaatar, where half the population is concentrated, approximately 38,500 t of waste bones are generated from the slaughterhouses. Analysis of waste composition shows that 7,124 t of waste bones were disposed of in official disposal sites in Ulaanbaatar.

#### Batteries and accumulators

The total amount of waste batteries and accumulators was estimated as the sum of vehicle accumulators, cell phone and computer accumulators and cell batteries, resulting in 1,851 t per year.

#### Waste tyres

The theoretical amount of waste tyres was estimated from the structure of vehicles operating in Mongolia, resulting in 15,359 t/y.

#### Waste electronic and electrical equipment

This waste stream includes TVs, refrigerators, washing machines, computers, electric heaters, water boilers and cell phones. Based on the proportion of households equipped with this equipment and their expected lifespan, it was estimated that 6,287 t of waste electronic and electrical equipment is disposed of per year.

#### Waste glass and glass bottles

Around 33,773 t of waste glass are generated annually, taking into account import and domestic production of beverages and food packed in glass containers, as well as empty glass containers and other glass products. Analysis of waste composition indicates that 31,818 t of waste glass was disposed of, according to records at waste disposal sites in Ulaanbaatar. National statistics show that, on average, 50,000 t of waste glass are separated out from municipal waste, but only about 1,500 t are actually recycled in Mongolia.

#### Waste plastics

EcoPark analysis of plastic waste generation estimates 15,000 t/y compared with 7,929 t/y of plastics disposed of in Ulaanbaatar. National statistics show much higher values: 120,000 t/y of separated plastics. EcoPark estimation does not take into account plastic packaging from industries. The recycled amount of plastics varies between 300 t/y and 4,000 t/y, due to changing demand for waste plastics. About 7,000 t of plastics is exported annually.

#### Scrap metals

There are two options for recycling ferrous and non-ferrous scrap metals. The majority of scrap metals is separated at source and sent directly to metallurgical plants for recycling, thus never becoming part of MSW. The second option is that scrap metals become part of MSW; data from Ulaanbaatar disposal sites indicate that about 136,000 t/y of ferrous and non-ferrous scrap are disposed of annually.

National statistics show that, on average, 130,000 t of scrap metals are separately collected and about 120 t are actually recycled in Mongolia.

#### Waste paper

Estimation of waste paper generation is difficult because of missing data on paper packaging. Disposal sites in Ulaanbaatar are receiving about 80,000 t of waste paper per year. In 2015–2016, on average, 130,000 t of waste paper were separately collected.

Recycling of waste paper in Mongolia is at a low level, accounting for only about 20 t per year.

#### Waste motor oils

Mongolia imported 981 t of motor oils in 2014. Based on this figure, waste motor oils were estimated to amount to 700 t/y. According to official records, the amount of used motor oil delivered to dumpsites in Ulaanbaatar is 489 t/y.

#### End-of-life vehicles

No national programme on recycling end-of-life vehicles is in place. A pilot project for dismantling end-of-life-vehicles was prepared by the branch of the Korea International Cooperation Agency in Ulaanbaatar in 2014, but it did not result in full operation. End-of-life-vehicles do not seem to be a priority problem in Mongolia.

### **10.2 Transboundary movement of waste**

Mongolia prohibited the import and transboundary movement of hazardous waste. In addition, its neighbours the People's Republic of China and the Russian Federation adopted similar bans. Thus, movement of hazardous waste over the borders of Mongolia is limited to exports to the People's Republic of China and the Republic of Korea on a case-by-case basis.

The only recorded case of transboundary movement of waste was about 3,000 t of lead acid battery scrap exported to the Republic of Korea in 2005–2006. The transport was conducted according to the requirements of the Basel Convention and based on permission granted by the Republic of Korea and the People's Republic of China.

Recyclable waste is exported from Mongolia mainly to the People's Republic of China, but information on the volume and types of recyclables is not available.

### **10.3 Pressures from waste**

No comprehensive study on the impact of waste and disposal sites on the environment or on human health was carried out in Mongolia. However, three types of waste have significant impact on the environment of Mongolia: municipal waste on uncontrolled disposal sites, hazardous waste stored in factories, and waste rock and tailing ponds from mining activities. There is only partial information on this impact; thus the full extent of damage to the environment and human health is not known at the moment.

#### *Air*

Air quality in the urban areas of Mongolia is affected by fires on disposal sites, which are often located close to the cities. It is estimated that 50 per cent of emissions of dioxins and furans generated in Mongolia are from the open burning of waste. Air quality in rural areas is affected by dust from waste rock heaps from mining activities. Waste rock accumulations are often unstable and wind erosion spreads dust in the surrounding area.

Dust can also be emitted by tailing ponds, if they are not operated correctly (e.g. when water evaporates, dust containing chemicals and heavy metal can be carried away). In Ulaanbaatar, air quality is also affected by flying ash from the ash ponds of power plants.

#### *Water*

Municipal waste disposal sites in Mongolia are not built with an impermeable layer isolating them from the surroundings. Despite the fact that Mongolia is a dry country and moisture from waste evaporates, if leachate occurs, it can reach groundwater and pollute it.

Also, tailing ponds at mining plants present a risk to local rivers because of unstable dams and leaching heavy metals.

Two accidents were recorded in CHP-4 in 2000 and 2008, when part of an ash pond retaining dam collapsed and ash flooded the surrounding area (and reached the Tuul River in 2000). The ash pond has been reinforced since then and is usually under water or snow; however, during the dry season, strong wind can blow ash away, even though CHP-4 takes preventative measures by pouring water into the ash pond to minimize environmental impacts.

#### *Soil, land and landscape*

The main threats to soil, land and the landscape are large, open-pit mining activities, which generate large amounts of waste soil, and ore processing activities, which discharge their waste in tailing ponds. These activities change the landscape and can make the soil infertile. The Government is aware of this risk and has introduced measures that require mining companies to rehabilitate land and the landscape after mining in an area is completed.

Disposal of municipal waste has a negative impact on land and the landscape if it is located near urban areas. Risks to surrounding land include burning of waste

and surface run-off from the disposal site, which may spread pollution and littering (waste blown away) from a site.

Local soil pollution can be caused by inappropriate storage of chemicals and hazardous waste and use of mercury in small-scale mining.

#### *Biodiversity and ecosystems*

Municipal and industrial waste management is typically a localized activity (performed on a small territory), which does not have significant impact on the biodiversity or ecosystems. Small ecosystems and local biodiversity can be affected by large accumulation of mining waste, for example, but this is a consequence of mining activities, not of waste itself.

#### *Human health*

The most endangered group of the population are scavengers on disposal sites. They are exposed to smoke from burning waste and fumes from decaying waste, and may be injured when picking waste. More than 200 people are regularly scavenging waste from dumpsites around Ulaanbaatar. There is no information on waste-related health impacts.

### **10.4 Legal, policy and institutional framework**

#### *Legal framework*

##### Legislation on waste management

Mongolia has specific legislation and a regulatory framework for waste management.

The 2003 Law on Household and Industrial Waste, which came into force in July 2004, was the first designated law on waste management. This Law governed waste collection, transportation, storage and landfill of household and industrial waste, and reusing of waste as secondary raw materials, and takes effective measures to prevent negative impacts of waste on public health and the environment. This Law was later revised to become the 2012 Law on Waste Management. The 2012 Law introduced reduce, reuse, recycle (3R) principles in greater depth than the previous law. The 2012 Law was replaced by the new Law on Waste Management in May 2017.

Waste is defined as any objects and materials that are not further reusable by the owner. Hazardous waste is defined in compliance with the Basel Convention.

The 2017 Law introduces new concepts in waste management in Mongolia. It includes hazardous waste

management issues, concerns and requirements. Economics and financing aspects of waste management are also explained and obtaining economic values from waste are also included. There is a significant addition in this regard as compared with the 2012 Law on Waste Management. For example, the waste service fee based on the number of persons residing in a household, rather than a flat rate per household, is prescribed as a fair fee. The Law also makes provision for incentives to individuals or entities that inform about waste management irregularities (i.e. an incentive equal to 15 per cent of the fines imposed for violation of legislation related to waste to be paid to the informant). This Law also places emphasis on the importance of providing education and raising awareness among the general public and other relevant stakeholders, aiming to instill a culture of environmentally friendly consumption, practising appropriate waste reduction, sorting and recycling activities. The Law describes such education on waste. Accountability for violation of legislation on waste is also highlighted.

The 2000 Law on Prohibition of Importing, Transit and Export of Hazardous Waste introduced the principles of the Basel Convention into the Mongolian legal system. Stipulation of this Law was incorporated into the 2012 Law on Waste Management and the 2000 Law was invalidated.

The country banned plastic bags with a thickness of 0.025 mm or less in packaging of imported food in accordance with the 2009 Law on Limited Use of Some Plastic Bags (no longer valid). This ban was repealed in 2012 with the Law on Waste Management. However, the 2012 Law included a ban on usage of plastic bags of 0.025 mm or lesser thickness in trading service. With the approval of the 2017 Law on Waste Management the ban on plastic bag usage was removed.

According to a 2002 rule on classification, collection, temporary storage, transportation and treatment of hazardous wastes (2002 Government Resolution No. 135), local governments have the power to decide on the siting of a hazardous waste disposal site based on the conclusions drawn by environmental and health professionals, until the central Government makes a decision. Hazardous waste shall be stored and packaged according to international standards. The regulation assigns responsibility for disposed waste to the producer.

The 2006 Order of the Minister of Environment No. 404 regulates the operation of waste disposal facilities; it defines types of waste disposal sites, siting requirements, procedures for the operation of waste

disposal sites and waste disposal actions by citizens, economic entities and organizations. This regulation also requires the recording of waste amounts received for disposal.

The 2006 Methodology for payment calculation for hazardous waste introduced the "polluter pays" principle and requires separation of hazardous from general waste, and registration of waste sources.

The 2017 Methodology for calculating waste norms is aimed at determining the amount of waste generation citizen, household, entity and product and estimating the amount of recyclable waste, the structure of waste and transportation cost.

The 2009 Regulation on a national inventory and reporting of hazardous waste aimed to prevent risks from hazardous waste, to establish a project that implements waste reduction methods, waste segregation, recycling and reporting of the amount of waste, and to regulate reclamation on disposal sites.

The 2015 Government Resolution No. 264 on approval of the list of hazardous wastes introduces the classification of hazardous waste generated by mining, agriculture and different types of industries. It is derived from the EU waste classification system.

#### Legislation on healthcare waste

The 2011 Joint Ministerial Order No. 305/320 defines rules on classification, collection, temporary storage, transportation and treatment of medical waste.

The 2009 Order of the Minister of Health No. 293 approves the Strategy on Improving Waste Management of Healthcare Organizations and Action Plan for Improving Waste Management of Healthcare Organizations for the period 2009–2013.

The 2010 Order of the Minister of Health No. 165 specifies the minimum standards for implementing infection prevention and control in healthcare facilities and defines colours and labels for waste packaging.

The 2011 Order of the Minister of Health No. 93 regulates calculation of the cost of healthcare waste treatment and transportation. It introduces a waste management chapter into a hospital budget. The cost of healthcare waste management is based on the amount of waste generated per bed per day plus the waste generated by outpatients.

The 2011 Order of the Minister of Health No. 179 provides guidelines for provincial healthcare waste

storage facilities, for soum and intersoum healthcare waste storage facilities, for construction and operation of a placenta pit, and for lists and technical specifications of basic equipment for sound healthcare waste management in aimag, soum and intersoum hospitals.

The 2011 Order of the Minister of Health No. 380 approves general operational guidelines of the central healthcare waste disposal facility in Ulaanbaatar.

#### Legislation on chemicals

The first law regulating chemical substances was adopted in 1995: the Law on Protection from Toxic Chemicals. This Law was replaced in 2006 with the Law on Toxic and Hazardous Chemicals. The 2006 Law regulates export, import, transboundary movement, production, storage, selling, transportation, usage, disposal and control of hazardous and toxic chemicals.

The 2008 Joint Order No. 04/04 of the ministers responsible for environment and health approved the classification of toxic and hazardous chemicals, which is based on the United Nations Globally Harmonized System of Classification and Labelling of Chemicals. The first list of banned and limited-use toxic and hazardous chemicals was approved by the Government in 1997. This list was renewed in 2007, containing 83 banned chemicals and 28 chemicals of limited use. New chemicals have been added to the list in 2008, 2010, 2011 and 2012; at present, 126 chemicals are banned and the use of 31 chemicals is limited in Mongolia.

Export, import, transboundary movement, production and trade of toxic chemicals and hazardous substances is regulated by the 2009 Joint Order No. 334/104 of the Minister of Environment and the Minister of Foreign Affairs. The 2007 Joint Order No. 151/126/52 of the Minister of Environment, the Minister of Health and the Minister of Emergency regulates the procedure for storage, transportation, usage and disposal of toxic and hazardous chemicals.

Guidance and methodology for risk assessment of toxic chemicals and hazardous substances is approved by the 2012 Joint Order No. A-50/378/565 of the Minister of Environment, the Minister of Health and the Director of NEMA.

The 2009 Joint Order No. 63/67/87 of the Minister of Environment and Tourism, Minister of Agriculture and Food and Minister of Health regulates the testing and use of pesticides, chemical fertilizers, insecticides,

rodenticides, hygienic and disinfection substances to be used for plant protection and veterinary purposes.

The first procedure to regulate POP-related activities was approved by the 2012 Joint Order No. A-17/16 of the Minister of Environment and the Minister of Health, on the Regulation on registration, collection, transportation, storage, disposal, import, export and transboundary movement of polychlorinated biphenyls (PCBs).

#### Legislation on radioactive waste

Mongolia does not have specific legislation for radioactive waste and deals with this issue under the 2009 Law on Nuclear Energy and other general legislation on nuclear and radioactive sources.

#### *Policy framework*

#### 1999 National Programme on Waste Reduction

The overall objective of the 1999 National Programme on Waste Reduction (1999 Government Resolution No. 50) covering the period 1999–2010 is to expand the involvement of the Government, citizens, business entities and organizations in the process of reducing waste by creating and maintaining a healthy and safe environment for the population. Its main objectives were:

- Improvement of the legal framework for the collection, transportation, separation, processing, reuse and disposal of waste;
- Identification of the location, size and properties of tailing ponds and location of waste disposal sites;
- Involvement of local administrative organizations, individuals and business entities in the implementation of the Programme and establishing mechanisms to support them;
- Improvement of waste collection and transportation and modernization of facilities and equipment;
- Organization and implementation of action for improving the sanitary situation by closing disposal sites that have adverse environmental impacts;
- Collection and treatment of hazardous waste;
- Minimization of waste by recycling and reuse.

Objectives of the Programme correctly identified areas of waste management that needed strengthening. However, the implementation plan underestimated the extent of work and investment needed. Although only a little progress was achieved, the importance of this Programme lies in the formulation of its objectives,

which attracted international assistance and started the much-needed transformation of the waste management system in Mongolia.

#### 2014 Waste Management Improvement Programme for 2014–2022

The 2014 Waste Management Improvement Programme for 2014–2022 (2014 Government Resolution No. 298) was approved as a response to urgent problems of waste management in Mongolia. The Programme comes with a work plan for implementation and implementation deadlines, financing sources and target evaluation criteria. The Programme aims to achieve a clean and healthy environment and enforce an appropriate waste management system through efficient use of resources, waste reduction, disposal of waste with minimal damage to the environment, and public education. The main objectives to be implemented are:

- Improving the legal framework for waste management;
- Increasing production efficiency, reducing the use of raw materials to decrease waste generation and supporting waste-free technology through the introduction of industrial waste management;
- Improving hazardous waste management and developing capacity for disposal of waste with minimum damage to the environment and prevention of accumulation of hazardous waste;
- Creating a better environment through public awareness on waste disposal, sorting and green habits;
- Reducing waste disposal through recycling, reuse and producing electricity generated from waste.

The Programme is expected to be implemented in two stages. The first stage (2014–2017) focused on improving the legal framework and waste minimization, strengthening infrastructure and financial capacity, and implementing comprehensive policies to involve citizens and businesses in waste minimization activities and to achieve behavioural change in waste disposal habits. These objectives were achieved in part. The new Law on Waste Management was approved in 2017 with a broader scope and infrastructure is gradually improving, especially in medical waste management, but the change in habits in waste disposal has not yet been achieved. The second stage (2018–2022) will focus on intensifying rehabilitation of environmental degradation caused by waste, on strengthening social responsibility and creating a suitable waste management system for a better environment.

The Programme does not have all the components to be characterized as a national strategy. It defines what goals and objectives should be achieved, but does not provide clear advice on how to achieve them, what options are available or preferred and what will be the cost of implementation of improvements. Full implementation of this Programme requires further analyses of the current situation and estimation of the costs of measures needed to improve waste management.

A new National Waste Management Improvement Strategy and Action Plan were prepared in 2017 by a joint team of experts of the Ministry of Environment and Tourism, UNEP International Environment Technology Centre and Asian Institute of Technology, Regional Resource Centre for Asia and Pacific. As of late 2017, this Strategy is not yet approved by the Ministry as a legally binding document.

The objectives of the Strategy are to highlight the necessity of greening the development pathway, to ensure sound management of solid wastes, promote conservation and efficient use of resources, strive for environmentally sound technologies and approaches, promote reduction of waste at source, reduce adverse impacts on the climate by reducing GHG emissions and short-lived climate pollutants generated by the waste sector, strengthen the legislative framework through the introduction of contamination penalty fees, drive behavioural change in the public towards the adoption of the 3R (reduce, reuse, recycle) principles, create infrastructure for the collection and disposal of waste, promote and encourage capacity-building and raise the social responsibility of citizens, business establishments and corporations. The Strategy will serve as one of the first official supplementary guidance documents to the newly approved Law on Waste (2017).

The Strategy covers MSW (from households/gers, commercial and institutional areas), construction and demolition (C&D) waste, healthcare waste, industrial waste, mining waste, tyre waste, e-waste, disaster waste and other non-hazardous wastes. It provides a strategic vision and direction for sustainable waste management from 2017 until 2030.

The strategic objectives proposed in the Strategy fall under the following categories:

- Improve the legal framework for facilitating better enforcement of the law to achieve sustainable waste management;
- Reduce final waste disposal by 30 per cent through the use of economic incentives for recycling and recovery of waste;

- Establish holistic waste management for hazardous waste;
- Reduce waste generation at source by providing public education to ensure habitual waste segregation;
- Reduce GHG emissions by transitioning to environmentally friendly technologies for final waste disposal;
- Establish required organizational structures and financial systems for sustainable waste management to ensure operational stability.

The Strategy is an ambitious plan which, if fully implemented, would significantly improve waste management in Mongolia and bring it to a new level. However, financing of individual objectives and actions is not quantified.

#### National Implementation Plans

NIPs for the Stockholm Convention were approved in 2006 and 2014 and a new version is currently under preparation. The 2014 NIP (2014 Government Resolution No. 341) identified the following key objectives:

- Enhance legislation that regulates POP-related activities by amending legislation on POP chemicals and revising existing analytical standards and reference values or adopting new ones;
- Reduce the release of POPs into the environment and further reduce adverse effects on human health through the establishment of proper collection, recycling and environmentally sound disposal of wastes containing new industrial POP chemicals; reduce import and use of products containing new industrial POPs; develop laboratory capacity and train specialized personnel, and research new industrial POP chemicals;
- Reduce unintentional POPs release from sources, mainly by reducing dioxin and furan releases from open burning of waste and from medical waste incineration; introduce BAT and best environmental practices (BEP) for the reduction of dioxin and furan releases from power plants, heating boilers and household stoves;
- Identify sites contaminated with POPs and implement decontamination measures;
- Phase out the use of PCB-containing equipment and finish decontamination of PCB-containing equipment and waste by 2020 to become a "PCB-free Country".

Activities and actions in the NIP will be implemented in two phases. Phase I (2014–2020) will focus on

activities for improvement of legislation, establishment of collection, recycling and environmentally sound disposal of waste, including hazardous waste, especially waste containing POPs, and developing laboratory capacity to determine POP chemicals. Phase II (2020–2030) will focus on activities for phasing out the use of POP-containing products, elimination of stockpiles, decontamination of contaminated sites and reduction of releases.

#### 2009 Healthcare Waste Management Strategy and Action Plan for the period 2009–2013

The overall objective of this Strategy and Action Plan is to create a system for collection, classification, transport and treatment of waste from healthcare organizations. The Strategy places a priority on disinfection of healthcare waste, abandoning the burning of waste and participation of the private sector. It recognizes the need for coordination on projects financed by international donors.

The objectives of this Strategy focused on creating coordination mechanisms between healthcare organizations and waste management companies and on improvement of management and organizational structure in healthcare organizations. Further, it highlighted the need to improve the legal environment for waste management in healthcare organizations, creating a sustainable financing mechanism for healthcare waste management and increased financing for healthcare waste management. It stressed the need to establish a comprehensive infrastructure for sorting, collection, storage, transportation, treatment and disposal of waste at all levels of the healthcare system. It also found it important to strengthen human resources specialized in waste management in healthcare organizations. Finally, it called for improved monitoring and evaluation of waste management in healthcare organizations. It was planned to allocate 3.029 million tugriks for implementation of this Strategy.

The results of implementation were evaluated at a meeting of the Ministry of Health Management Council in April 2013. The Ulaanbaatar Health Department and 19 aimag health departments presented reports on implementation of the Action Plan. The Management Council concluded that the main objectives of the Strategy were achieved: implementation had resulted in improvements and had positive impact on healthcare waste management, but there are issues that need further attention.

Since the implementation of this Strategy, visible progress in healthcare waste management was achieved, at least in Ulaanbaatar. The system introduced in Ulaanbaatar is a viable and sustainable solution but is not yet expanded to other regions of Mongolia.

#### 2016 Mongolia Sustainable Development Vision 2030

The Mongolia Sustainable Development Vision 2030 covers waste management in its Environmental Sustainability Objective 2: "Improve the planning of cities and urban settlements, enhance the quality of and accessibility to infrastructure facilities, advocate scientific and clean living habits among the populace, and improve the quality of the environment and waste management systems". Although this objective allows much wider inclusion of waste management targets, Mongolia has chosen only one indicator: the amount of recycled waste. It is expected that the amount of recycled waste will increase to 20 per cent of total waste by 2020, then to 25 per cent by 2025 and to 30 per cent by 2030.

#### 2014 Green Development Policy

Strategic Objective No. 1 of the Green Development Policy is to "Promote a sustainable consumption and production pattern with efficient use of natural resources, low greenhouse gas emissions, and reduced waste generation". In the area of waste management this should be achieved by measure 3.1.8: "Promote resource-efficient and low-waste technologies for the mineral resources sector". Additionally, Strategic Objective No. 3: "Increase investment in natural capital, human development and clean technology by introducing financing, tax, lending and other incentives for supporting a green economy" includes measure 3.6.4: "Reduce solid waste in landfills by 20 per cent by 2020, and by 40 per cent by 2030, by improving proper reduced waste management by promoting efficient technology, providing knowledge and ensuring healthy habits and lifestyles, and through increased waste recycling and processing, and promoting the production of value-added products".

Criteria and indicators which shall be used to measure the results of Green Development Policy implementation include one waste-related indicator: The share of waste recycling should reach 20 per cent in 2020 and 40 per cent by 2030, compared with base year 2013. The current waste separation rate is about 20 per cent of generated MSW but the majority of separated MSW is exported. Increasing recycling capacity will require significant investment.

### 2008 National Chemicals Management Profile

The 2008 National Chemicals Management Profile characterized storage, disposal and treatment of obsolete chemicals and hazardous waste as a high nationwide priority and the ability of the Government to deal with it as low. In addition, it emphasizes that there are insufficient data on chemicals and waste.

### 2017 Subprogramme on Improvement of Waste Management in Ulaanbaatar for the period 2017–2020

The 2017 Subprogramme on Improvement of Waste Management in Ulaanbaatar for the period 2017–2020, approved in November 2017, was prepared to support implementation of the national Waste Management Improvement Programme for 2014–2022. It follows the structure of the national programme and defines the following objectives for Ulaanbaatar City:

- Introduction of municipal waste reduction and sorting systems through the promotion of good practices and habits in waste management and encouraging green procurement, thus reducing the amount of municipal waste destined for disposal;
- Further improvement of municipal waste collection, enforcement of regular waste collection by better planning and coordination of waste collection routes, inclusion of recycling centres in collection routes and modernization of the vehicle fleet;

- Development of waste recycling plants with the involvement of the public and private organizations and increased use of products from recycled waste;
- Improvement of waste disposal site infrastructure and modernization of site operational equipment;
- Improvement of street and public space cleaning, maintenance of water dams and rainwater collectors, review of the tariffs for street cleaning and snow removal;
- Expanding waste services to remote khoroos (subdistricts), camps and recreational areas;
- Strengthening human resource capacity for waste management by establishing an independent unit for implementing waste management policy in Ulaanbaatar;
- Creating a sustainable system for financing waste management;
- Creating environmentally friendly collection, transportation and storage systems for hazardous waste produced by households and enterprises in Ulaanbaatar.

This document includes a detailed implementation plan stating quantified targets and responsible organizations. It is assumed that full implementation over four years will cost 783.5 billion tugriks.

#### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Targets 3.9, 11.6, 12.4 and 12.5 of the 2030 Agenda for Sustainable Development is described in box 10.3.



**Box 10.3: Targets 3.9, 11.6, 12.4 and 12.5 of the 2030 Agenda for Sustainable Development**

#### **Goal 3: Ensure healthy lives and promote well-being for all at all ages**

#### **Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination**

Global Indicator 3.9.3 is the mortality rate attributed to unintentional poisoning. The mortality rate from unintentional poisoning in Mongolia, according to WHO, was 2.2 persons per 100,000 population in 2015. This was a decrease in comparison with 2012, when Mongolia reported 3.8 persons per 100,000 population. However, Mongolia has the highest unintentional poisoning mortality rate of the Western Pacific region. This region had an average mortality rate from unintentional poisoning of 1.4 persons per 100,000 population in 2015. The global average mortality rate from unintentional poisoning was 1.5 persons per 100,000 population in 2015.

Pesticides, kerosene, household chemicals and carbon monoxide are common causes of unintentional poisoning in low- and middle-income countries. Mongolia has implemented a legal framework regulating the import and use of chemicals, which are one of the causes of unintentional poisoning. In order to decrease the mortality rate attributed to unintentional poisoning, Mongolia should enforce the legal framework regulating the import and use of chemicals.



**Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable****Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management**

Global Indicator 11.6.1 is the proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities. Mongolia has implemented legislation requiring regular collection and disposal of waste, but disposal of waste is not sufficiently regulated, as technical standards for landfill construction are not in place. The only site operated adequately is Narangiin Enger Disposal Site, which received 557,962 t or almost 50 per cent of waste from Ulaanbaatar in 2014. Two thirds of the urban population of Mongolia lives in Ulaanbaatar, where MSW collection coverage is above 90 per cent. It can be estimated that, of all MSW generated in Mongolia, 70 per cent is regularly collected and 30 per cent is adequately disposed of.

Data from cities in 101 countries from 2009 to 2013 indicate that 65 per cent of the urban population globally was served by municipal waste collection. Collection coverage in Europe, North America and Australia is above 95 per cent and all urban collected waste is disposed of adequately. Mongolia should improve urban solid waste collection as well as final disposal in order to achieve Target 11.6 with regard to waste.

**Goal 12: Ensure sustainable consumption and production patterns****Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment**

The global indicators are: 12.4.1 (Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement) and 12.4.2 (Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment).

Mongolia is a party to the key waste and chemical management conventions and has adopted the implementing legal frameworks. The Convention on Persistent Organic Pollutants is actively implemented. Improvements are needed in active participation in the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention) and the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention). The Minamata Convention on Mercury was ratified by Mongolia in 2015; however, Mongolia had already banned the import and use of mercury in 2007.

The amount of hazardous waste generated per inhabitant depends on industry type and size and population. For example, the EU average in 2014 was 150 kg/cap, ranging from 7,500 kg/cap in Estonia to nearly zero in Malta. Countries with extensive mining activities have high amounts of hazardous waste generated per inhabitant (e.g. Serbia, 1,900 kg/cap; Bulgaria, 1,800 kg/cap.) Nearly half (49.0 per cent) of the hazardous waste treated in the EU-28 was landfilled (equivalent to 73 kg per inhabitant). Some 6.0 per cent of all hazardous waste was incinerated without energy recovery (9 kg per inhabitant) and a further 7.4 per cent with energy recovery (11 kg per inhabitant). More than one third (37.5 per cent) of hazardous waste in the EU was recovered (recycled or used for backfilling) in 2014, equivalent to 56 kg per inhabitant.

In middle-income countries, hazardous waste generation per capita rose from 17 kg between 1996 and 2000 to 42 kg between 2006 and 2011. However, high-income non-OECD countries continue to generate the most hazardous waste, 981 kg per capita between 2006 and 2011. Hazardous waste generation by low-income countries was 7 kg per capita over the same period.

Mongolia does not have reliable data on hazardous waste; thus, hazardous waste generated per capita and the proportion of hazardous waste treated cannot be evaluated. Considering Mongolia's small population and extensive mining development, this parameter may be far over the global average. Due to the lack of indicators and data on hazardous waste, Mongolia should consider improving reporting mechanisms on hazardous waste to measure its progress towards achieving Target 12.4.

**Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse**

The global Indicator 12.5.1 is the national recycling rate, tons of material recycled. The requirement to reduce waste generation has been included in Mongolia's solid waste management legislation since 2012. According to the 2017 Law on Waste Management, the State Great Khural shall provide economic incentives for the conduct of operations related to waste processing, reuse, recycling, regeneration and disposal.

Mongolia's progress towards achievement of this target can be estimated from the Waste Management Improvement Programme for 2014–2022, which states the MSW recycling rate of 4.4 per cent (excluding metals) in 2013 and defines the target of 10 per cent by 2018 and 22 per cent by 2022. A JICA study estimated a recycling rate of about 11 per cent of MSW in 2015. However, verification of these figures is not possible, due to the low quality and structure of existing data. There is no information on the recycling rate of industrial waste. Therefore, Mongolia is not able to measure its progress towards achieving Target 12.5 and should consider improving reporting mechanisms on hazardous waste.

The global average recycling rate cannot be defined as it depends on too many country-specific parameters. For example, MSW recycling in the EU was 29 per cent in 2015. The highest recycling rates of MSW, around 60 per cent, are reported from countries such as Austria, Germany and Singapore.

### *Institutional framework*

The State Great Khural has the right to define economic incentives supporting waste reuse, treatment, recycling, regeneration and disposal and approve the budget for these activities. These are new stipulations established by the 2017 Law on Waste Management and they would contribute to further development of waste management in Mongolia.

The Ministry of Environment and Tourism is responsible for development and implementation of national policy on waste management and approving the action plan needed to implement this policy, and is responsible for establishing a national database on waste, including approval of forms and registration documents for hazardous waste transport and waste management activities. The Ministry shall also implement a producer's responsibility scheme, which is a new task, not included in the 2012 Law on Waste Management.

The Ministry has only one person in the Environment and Natural Resources Management Department who is directly responsible for waste management. Everyday activities are performed in cooperation with other departments of the Ministry and in coordination with local authorities.

The 2012 Law on Waste Management introduced a system that requires every ministry to develop waste management standards and regulations for organizations under its responsibility. The Ministry of Health has upgraded its traditionally good regulation and standards by the trilateral agreement with the Municipality of Ulaanbaatar and private company Element LLC. The Ministry of Mining and Heavy Industry implements and enforces regulations for mining waste and reclamation. Other ministries did not achieve tangible results in improving waste management through new standards and regulations. The 2017 Law on Waste Management introduces a new requirement, that the Ministry of Finance shall cooperate with the Ministry of Environment and Tourism on development of waste management financing schemes. This may create a more attractive environment for investments in waste management in Mongolia.

Municipal waste management is enforced through the aimags and soums; in the case of Ulaanbaatar, it is enforced through the Capital City and district administrations. Aimags are responsible for local waste management programmes and monitoring the actions of soums. Soum and district governors organize waste management services directly or by contracting private companies, cleaning public areas,

providing waste bins and supporting public awareness and citizens' initiatives in waste management. The improvement of municipal waste collection and changes in waste fees collection show that attention is being given to waste services and the quality of service is improving.

The Nuclear Energy Commission coordinates the activities related to the use of nuclear energy and radioactive minerals and ensuring nuclear safety. GASI issues licences for the use of radiation sources. Licences for activities related to radioactive minerals are issued by the Mineral Resources and Petroleum Authority.

MonAtom LLC is a State-owned company established in 2009. It is prospecting for uranium and other radioactive minerals, identifying and estimating uranium resources; it also performs a high-standard survey on the territory of Mongolia, participates independently or in collaboration with others on exploration and exploitation of uranium and maintains a database on uranium studies.

The National Association of Waste Recycling Industries was founded in 2005 with the aim to protect the interests of waste recycling entrepreneurs and support the development of waste management and waste recycling in Mongolia. The Association conducts the sorting, transportation and recycling of waste and exports recyclables. The Association includes eight recycling companies, more than 100 entrepreneurs and 20,000 secondary raw material collectors in 21 aimags, and covers 200 collection points operating in five aimags.

#### Coordination with institutions responsible for waste management at national, aimag and soum levels

Horizontally, the Ministry of Environment and Tourism cooperates with other ministries on the development of sector-specific waste management regulations and waste management plans. The Ministry of Health and the Ministry of Mining and Heavy Industry are the most advanced in implementing waste legislation and strategies. Vertically, the Ministry cooperates with city mayors and aimag governors in the implementation of waste legislation. The Ministry expressed its view that cooperation with city mayors and aimag governors is good and there are regular meetings; however, the Ulaanbaatar Municipality indicated that more support from the Ministry is expected.

The bulk of solid waste management handling responsibilities, including waste collection,

transportation and disposal, street sweeping and public space cleaning, are the city government's responsibility. In the aimags, the aimag environmental and tourism departments and other entities are involved in waste management process.

In Ulaanbaatar, the Municipality sets the budget and policy, coordinates the districts and controls city-wide activities, including waste management. The Urban Landscaping Department of Ulaanbaatar City (previously known as the City Waste Management Department) directly manages the collection and disposal of solid waste. It operates waste landfills and collects and transports waste from public places, contracting out these services to the State-owned enterprise, Ulaanbaatar Tuk.

Until 2007, the City Waste Management Department directly managed the collection and disposal of solid waste in Ulaanbaatar. In 2007, a new regulation on waste management was introduced to minimize the city government's involvement, while increasing management efficiency. Under the current institutional arrangement, each district government is responsible for collection and transportation of waste from homes, business entities and all other locations, except for public spaces. The waste management department of each district collects fees (which are set by the city council), manages contracting services with a privately run waste collection and transportation company (Ulaanbaatar Tuk) and provides street-cleaning services.

#### *Regulatory, economic, fiscal and information measures*

##### Permits

The permitting system for waste management is decentralized. The Ministry of Environment and Tourism issues permits to legal entities and organizations for the transportation, collection, storage, recycling, disposal and export of hazardous waste. Permits for disposal site operation are issued by the aimag and Capital City governors. Permits for collection and transport of waste are issued by soums and districts. There is no central database of these permits. Waste is absent from the EIC databases and the NSO website.

The Government has reformed the approval procedure for the import and export of chemicals across government agencies to establish coordinated control over chemicals. Previously, before 2007, local governments would grant consent for the import of hazardous and toxic chemicals and other chemicals, which led to uncontrolled and uncoordinated imports

of chemicals and, sometimes, imports of hazardous and toxic chemicals named for customs purposes as ordinary chemicals. The Government regulated and assigned power exclusively to the Ministry of Environment and Tourism to grant permission for the import of all chemicals, providing an opportunity to solve such problems. The Ministry granted permits for the import of hazardous chemicals to 170 companies in 2016.

##### Taxes and fees

User fees and subsidies from soum/district and aimag authorities finance waste management services in Mongolia. Waste fees in Ulaanbaatar are defined by the 2006 Resolution of the Citizens' Representative Khural of the Capital City No. 182.

Waste fees in apartment areas are set per household, at 2,000 tugriks per month. Fees are collected by the housing company or a condominium representative and transferred to the soum/district tax account, reduced by a 6 per cent commission for fee collection. The rate of collection of waste fees in apartment areas is 90 per cent, with total fees collected amounting to 2.2 billion tugriks in 2014.

Waste fees in ger districts are set per electricity meter, irrespective of the number of people living there. Since July 2011, the monthly waste fee of 2,500 tugriks has been paid together with the electricity bill and the Power Distribution Company then transfers collected fees to the soum/district, retaining a commission of 23 per cent. In ger districts, until June 2011, the waste fees were collected by the waste collection vehicle driver and the collection rate was about 30 per cent. After the change in the fee collection system, the collection rate increased to 60 per cent. In 2010 and 2011, total collected fees amounted to about 3 billion tugriks annually; by 2014, they had increased to 6 billion tugriks.

For businesses, each operational entity contracts directly with solid waste collection companies to receive the service. The district tax agency collects waste fees based on business entities' registration information. Each entity's waste collection fee is estimated on the basis of the type of business, its size and other factors. The average waste fee is 35,000 tugriks per month, although it may range from 10,000 to 200,000 tugriks. Analysis of revenue collection data from 2013 and 2014 shows that nearly 90 per cent of business entities that have a service contract paid the service fee, which represents a 60 per cent participation rate for businesses overall. Total waste service fees collected from businesses amounted to 6 billion tugriks in 2014. Before changes in the fee

collection system in 2011, the waste fee collection rate was only 20 per cent.

The cost of MSW management activities in Ulaanbaatar was 23 billion tugriks in 2014. This is a significant increase compared with 2013, when it was 8.6 billion tugriks. This increase was caused mainly by the provision of additional financing for waste transportation and cleaning public streets and squares. These actions were intended to help improve overall waste collecting services, prevent illegal dumping and maintain the cleanliness and sanitary conditions of Ulaanbaatar.

Subsidy for collection and transport of waste represents about 30 per cent of the annual budget of a collection company in Ulaanbaatar. The amount of subsidy depends on the amount of waste collected and distance to a disposal site. Operation of disposal sites is financed from the municipal budget. Fiscal mechanisms such as waste disposal charges or a tax on landfill disposal, which create an artificial market value for certain fractions of the waste stream, do not exist. The subsidy for disposal sites is 2,080 tugriks per ton of received waste and has not changed since 2006.

### 10.5 Participation in international agreements and processes

Mongolia has been a party to the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) since 1996. National reports to the Secretariat of the Basel Convention, which must be submitted on an annual basis, were submitted only in 2001, 2005, 2014, 2015 and 2016 and contain only partial information.

Mongolia has been a party to the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention) since 2001. Mongolia was particularly active in this Convention in 2010, when it provided 29 responses on the import of chemicals and pesticides. However, Mongolia failed to transmit an import response to the Secretariat of the Rotterdam Convention in 18 cases in the period 2004–2016 (chapter 6).

The Convention on Persistent Organic Pollutants (Stockholm Convention) was ratified by Mongolia in 2004. National reporting is required every four years and the Ministry of Environment and Tourism submitted Second and Third National Reports to the Secretariat of the Stockholm Convention (chapter 6). The Third National Report was prepared with the assistance of UNIDO.

Mongolia has been a party to the Minamata Convention on Mercury since 2015. In 2007, the Government issued a ban on the import of mercury and its use and is active in enforcing this legislation (chapter 6).

Mongolia does not participate in the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management.

### 10.6 Assessment, conclusions and recommendations

#### *Assessment*

Waste management in Mongolia has started to change from the practice of cleaning the city/area and dumping waste beyond city/area limits to organized, planned and regular waste collection and disposal to designated places. Regulation of waste practices is becoming stricter and the legislative base has been strengthened step by step. There is a risk to implementation of the national Waste Management Improvement Programme, because its goal and objectives are defined on a national level, but implementation and enforcement are mainly on the aimag and soum levels. The result is that MSW management is improving, as this is in the interest of aimag and soum authorities, but industrial waste management is not progressing.

#### *Conclusions and recommendations*

##### Institutional capacity for waste management

The current capacity of the Ministry of Environment and Tourism in waste management is limited and cannot ensure a national approach to waste management. This can be achieved by introducing a waste management department in the structure of the Ministry, which would ensure the fulfilment of all the tasks defined in the Law on Waste Management and coordinate the actions of other ministries in waste management improvement. Another option is to establish a waste management agency, which would assist the waste management expert in the Ministry, concentrate technical knowledge and distribute it among ministries, aimag and soum authorities and industries, and also coordinate international assistance in waste management.

#### Recommendation 10.1:

*The Ministry of Environment and Tourism should consider strengthening its capacity in waste management by establishing a waste management department or a waste management agency, which*

would act as a centre of excellence and be a driver of waste management improvement.

#### Strategic documents

The priorities in waste management during the last decade were the improvement of MSW management and healthcare waste management. These improvements were a response to immediate needs and development of critical infrastructure. However, achieving change in the management of waste, and especially of hazardous waste generated by manufacturing, mining and agriculture, requires close cooperation with other ministries. Sectoral strategies or sectoral waste management plans are not in place.

#### Recommendation 10.2:

*The Government should:*

- (a) *Ensure that sectoral ministries develop and implement waste management strategies, as applicable;*
- (b) *Approve the new national waste management strategy and prepare a financing plan for this strategy;*
- (c) *Ensure that waste management plans are developed and implemented at the municipal level, to avoid inadequate waste disposal systems, such as large dumping sites around cities.*

#### Waste management data

Data on generation and management of waste are crucial information for effective decision-making. Although waste data have been collected for more than a decade, their quality is low. A list of hazardous waste derived from the EU Waste Classification was adopted in Mongolia, but it is not used in practice. Other waste-management-related data exist, but they are not aggregated at the national level (e.g. rehabilitation of mining areas, tailing ponds in the mining and energy sector). The lack of waste management data impedes the development of projects and provision of information to the public. It does not provide an adequate picture of achievements in the waste sector. In addition, data verification is not formally done to ensure that published data reflect the real situation as exactly as possible. Cooperation with the NSO is limited in regard to the inclusion of waste data in Statistical Yearbooks.

Due to the low quality of data on waste and chemicals, Mongolia is not able to measure its progress towards SDG Target 11.6 (By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal

and other waste management) in relation to municipal and other waste management, and SDG Target 12.4 (By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment) in relation to environmentally sound management of chemicals and all wastes throughout their life cycle.

The 2017 Law on Waste Management envisages the implementation of a waste database and training of waste producers in the identification and classification of waste and hazardous waste.

#### Recommendation 10.3:

*The Ministry of Environment and Tourism, through the Environmental Information Centre, and the National Statistics Office should develop and implement the national waste database and metadatabase on waste data, introduce data verification procedures and publish annual statistical reports on waste management.*

#### Radioactive waste

Although radioactive waste is not considered an immediate priority, a basic legal framework and strategic documents and action plans that would ensure its safe management are lacking. Mongolia is not a party to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, which provides the basic framework for safe management of radioactive waste. Participation in this Convention would allow Mongolia to benefit from international cooperation and achieve international standards in the management of radioactive waste.

#### Recommendation 10.4:

*The Nuclear Energy Commission, in cooperation with the Ministry of Environment and Tourism, should:*

- (a) *Consider participation in the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management;*
- (b) *Develop specific strategy, plans and legislation for radioactive waste management.*

#### Recycling

Separation of recyclables from municipal waste is well developed, with a system of buy-out points. However, most recyclables are exported because Mongolia lacks recycling capacities. This situation will change with

the development of EcoPark, which is planned by the National Association of Waste Recycling Industries. Enhancing recycling capacities will have positive effects on the reduction of disposed waste, creation of green jobs and sustainable use of natural resources.

*Recommendation 10.5:*

*The Government, through the Ministry of Environment and Tourism and the Ministry of Finance, should support the development of EcoPark as a modern waste management centre.*



## Chapter 11

# BIODIVERSITY AND PROTECTED AREAS

### 11.1 Current situation and trends in species and ecosystems

The considerable size of the territory of Mongolia (1,564,116 km<sup>2</sup>), along with the extremely sparse population of the countryside (approximately 0.6 pers. per 1 km<sup>2</sup>) and extensive land-use patterns, are favourable for landscape and nature conservation. Location of population far away from large cities, industrialized regions and connecting major transport routes also limits human impact on natural ecosystems. In 2015, areas under roads, networks, cities, villages and other settlements constituted only 0.8 per cent of the country's territory (figure 12.1).

#### *Species diversity*

In 2017, the flora included 3,160 species or subspecies of vascular plants belonging to more than 680 genera and 108 families, including more than 120 endemic and 490 subendemic species. Furthermore, some 580 species of moss, 1,033 species of lichens, 2,003 species and subspecies of algae and 574 species of fungi were present. Mongolian forests harbour 140 species of trees and shrubs; the main forest-forming species are larch (*Larix sibirica*) – the dominant tree species in Mongolia, pine (*Pinus silvestris*), cedar, spruce, fir, birch, aspen, poplar, elm and willow. Mongolian fauna consists of 138 mammal species, 75 fish species, 21 reptile species, 6 amphibian species, over 500 bird species, over 13,000 insect species and about 30 species of molluscs.

#### *Threatened species*

According to the IUCN Red List of Threatened Species (2017–1), only one plant species occurring in Mongolia is categorized as globally Near Threatened (NT), nine are categorized as Data Deficient (DD) and 187 as of Least Concern (LC). As for Mongolian fauna, as many as 41 animal species (11 mammal, 25 bird, 2 fish and 3 invertebrate) are considered globally threatened: 4 species are categorized as Critically Endangered (CR), 12 species as Endangered (EN) and 25 species as Vulnerable (VU). A further 28 fauna species are categorized as NT, 8 as DD and 509 as LC.

In the period 2006–2011, Mongolia developed the third edition of its Red Lists of flora and fauna, for the first time following guidelines for adopting IUCN

criteria at the regional level. As many as 110 of all 148 assessed vascular plant species (over 74 per cent) were classified in 2011 as regionally threatened in Mongolia: 16 species as CR, 39 species as EN and 55 species as VU. The conservation status of 48 fish species (from among 64 native species) was assessed: 11 fish species were considered in 2006 as regionally threatened in Mongolia, including one species, Siberian sturgeon (*Acipenser baerii*) categorized as CR; 6 species were considered as EN: Gobi loach (*Barbatula dgebuadzei*), Dzungarian dace (*Leuciscus dzungaricus*), pidschian (*Coregonus pidschian*), Amur grayling (*Thymallus grubei*), Hövsgöl grayling (*Thymallus nigrescens*) and taimen (*Hucho taimen*), and a further 4 species as VU. Of the 24 native reptile and amphibian species assessed, 2 reptile species: Gobi naked-toad gecko (*Cyrtopodion elongatum*) and adder (*Vipera ursini*), and 4 amphibian species: Chinese brown frog (*Rana chensinensis*), Japanese treefrog (*Hyla japonica*), Siberian salamander (*Salamandrella keyserlingii*) and Pewzow's toad (*Bufo pewzowi*) were classified in 2006 as regionally threatened, and categorized as VU. A further 5 reptile species were categorized as NT, 1 as DD and 12 as LC.

In 2011, of the 476 assessed bird species, 20 were considered to be threatened on a regional scale. Two species were categorized as CR: the Dalmatian pelican (*Pelecanus crispus*) and Siberian crane (*Grus leucogeranus*); 6 species were categorized as EN: the white-headed duck (*Oxyura leucocephala*), relict gull (*Larus relictus*), greater spotted eagle (*Aquila clanga*), Pallas's fish-eagle (*Haliaeetus leucoryphus*), short-toed snake-eagle (*Circaetus gallicus*) and reed parrotbill (*Paradoxornis heudei*). Twelve bird species were categorized as VU: the lesser white-fronted goose (*Anser erythropus*), Baikal teal (*Anas Formosa*), ferruginous duck (*Aythya nyroca*), bearded vulture (*Gypaetus barbatus*), Eastern imperial eagle (*Aquila heliaca*), Saker falcon (*Falco cherrug*), white-naped crane (*Grus vipio*), hooded crane (*Grus monacha*), Asian dowitcher (*Limnodromus semipalmatus*), great bustard (*Otis tarda*), houbara bustard (*Chlamydotis undulate*) and Mongolian ground-jay (*Podoces hendersoni*), while 16 further bird species are considered NT. Almost 90 per cent of birds in Mongolia are categorized as LC.



Among 128 native mammals, as many as 21 species (16.4 per cent of the total), including 79 per cent of native ungulate species, 12 per cent of carnivore species and 12 per cent of rodent species, were considered in 2006 as regionally threatened in Mongolia. These include three mammal species categorized as CR on a regional scale: the Gobi bear (*Ursus arctos gobiensis*), Przewalski's horse (*Equus ferus spp. przewalskii*) and red deer (*Cervus elaphus*). Another 14 species were categorized as EN: the snow leopard (*Uncia uncia*), Asiatic wild ass (*Equus hemionus*), wild Bactrian camel (*Camelus bactrianus ferus*), argali sheep (*Ovis ammon*), Mongolian gazelle (*Procapra gutturosa*), saiga antelope (*Saiga tatarica mongolica*), Siberian musk deer (*Moschus moschiferus*), elk (*Alces alces*), Eurasian beaver (*Castor fiber*), Siberian marmot (*Marmota sibirica*), Alashan ground squirrel (*Spermophilus alashanicus*), small five-toed jerboa (*Allactaga elater*), Mongolian three-toed jerboa (*Stylodipus sungorus*) and tamarisk jird (*Meriones tamariscinus*); and 4 species as VU: goitered gazelle (*Gazella subgutturosa*), reindeer (*Rangifer tarandus*), long-eared jerboa (*Euchoreutes naso*) and sable (*Martes zibellina*). A further eight species were categorized as NT, including the grey wolf (*Canis lupus*), Eurasian lynx (*Lynx lynx*), Siberian ibex (*Capra sibirica*) and wild boar (*Sus scrofa*). Only the Asiatic wild dog (*Cuon alpinus*) is Regionally Extinct (RE) in Mongolia. As many as 37 per cent of mammal species (mostly small mammals) were DD; therefore, intensified research is necessary, in order to determine their actual conservation status.

#### *Trends in threatened and widespread wild species populations*

Between 2006 and 2010, some shrub and willow species that are vital to the oasis system became regionally extinct, while distribution areas of some plant species decreased due to habitat loss.

Since the beginning of the twenty-first century, the distribution range of many fish and amphibian species has decreased. As for reptiles, there are no documented cases of species population decline.

The most up-to-date evaluation of bird species population trends over the period 2000–2010, carried out in 2011 with the use of Birdlife International methodology, shows that, of 476 bird species, 64.9 per cent have stable populations, 4 per cent have a declining population trend, and only 0.1 per cent of species have a recorded population increase, while the trend for 31 per cent of species' populations is indeterminate.

Population trends of each of the three mammal species classified as CR on a regional scale are different: the Gobi bear population is very limited but stable (some 20–25 animals in 1980, 22–31 in 2010, 28 in 2014 and 30 in 2016), while the population of successfully reintroduced Przewalski's horse is considered to be slowly increasing (414 animals in 2009, 312 in 2010, 351 in 2011, 385 in 2012, 435 in 2013, 471 in 2014, 529 in 2015 and 540 in 2016). The red deer population fluctuated throughout the last three decades: it increased from 130,000 in 1986 to some 200,000 in the early 1990s, then rapidly declined (mainly due to poaching) to some 8,000–10,000 in 2004, and recovered slightly to reach some 16,482 specimens, according to the most recent nationwide wildlife census carried out in 2010.

#### Mammal species classified in 2006 as endangered in Mongolia (EN on a regional scale)

The population of the wild Bactrian camel (global status: CR) decreased from 650 in 1985 to only 350 in 2004 (46 per cent decline within only two decades). It is estimated that some 25 to 30 animals are illegally hunted (mainly for local subsistence use) each year. Should this trend continue into the future, the current small population might experience further decline, seriously threatening its survival.

The population of the saiga antelope (global status: CR) initially increased, due to favourable climatic conditions, and as a result of conservation measures, from only 300 in 1978 to 1,400 in 1993, 3,000 in 1998 and some 5,200–5,300 in 2000. In the period 2000–2002, due to repeated dzuds, the saiga population significantly decreased by over 80 per cent to 1,020 at the end of 2002, and further declined, due to poaching, to 750 in 2004. Then it recovered slowly and reached 3,200 in 2008 and about 8,000 in 2010. However, in late 2016, the livestock-transmitted contagious Peste des Petits Ruminants virus seriously affected the saiga population, causing near-catastrophic herd depletion by over 50 per cent, to some 4,500–5,000 head, which could now justify assigning the species CR status on a regional scale also. However, accurate data on the size of the saiga antelope population in 2017 is not yet available.

Estimates of the snow leopard (global status: EN) population vary – 1,000 in 1990, 500–1,700 in 2000 and 809 in 2009.

The population of the Siberian musk deer (global status: VU) continued to decrease, from 60,000–80,000 in the 1970s to some 44,000 in 1986 and only 6,525 in 2010 – an 83 per cent decrease within the last three decades.

The population of the Asiatic wild ass (global status: NT), which is the largest remaining population worldwide, decreased from approximately 39,500–42,500 in the mid-1990s to 17,172 in 2002 and 14,051 in 2009. Three large-scale springtime ground surveys resulted in comparable population estimates of 35,899 head in 2013, 39,998 in 2014 and 36,298 in 2015. A simultaneous point count in 2010 estimated another 5,671 wild asses over 11,027 km<sup>2</sup> in the Dzungarian Gobi. These data suggest a population of over 40,000 in Mongolia, with likely an additional 1,500 in the Transaltai Gobi, as there have been no reported changes there since the 1997 aerial survey, plus further animals in the eastern Gobi, giving an estimate of over 42,000 animals. Based on these updated population estimates, Mongolia houses 75 per cent of the global population of Asiatic wild ass.

The argali sheep (global status: NT) population significantly decreased, from 60,000 in 1985 to approximately 13,000–15,000 in 2001, i.e. by some 75 per cent in less than two decades. According to the SoERs, the argali sheep population was only 3,059 in 2002 and reached approximately 18,140 in 2009. Although subsistence hunting for argali has been prohibited since 1953, trophy hunting is still permitted for foreign and Mongolian hunters, while poaching continues to be an important cause of argali mortality.

The estimates of the Mongolian gazelle population (global status: LC) varied between 400,000 and 2,700,000 in different years, as the species is subject to strong fluctuations, due to severe winter conditions and periodic outbreaks (e.g. in 2005 and 2010) of the highly contagious livestock-transmittable foot-and-mouth disease (FMD). The decrease in the Mongolian gazelle population is also partially attributed to poaching. Currently, the size of the Mongolian gazelle population can be estimated at around 1 million.

The population of elk (global status: LC) decreased from 14,000 in 1898 to only 7,100 in the period 2008–2010, and is predominantly distributed in the Khentii Mountains.

The population of the goitered gazelle (global and regional status: VU), which is the largest remaining population of this species worldwide, decreased by 80 per cent, from 60,000 in the early 1990s to 11,978 in 2009, and is further declining, due to poaching. The most recent population estimates, in 2015, suggest that approximately 33,627 goitered gazelles exist across 78,717 km<sup>2</sup> in the eastern Gobi (parts of Dornogobi and Umnugobi aimags). A similar survey conducted

in 2010 estimated 5,909 goitered gazelles over 11,027 km<sup>2</sup> in the Dzungarian Gobi.

#### *Invasive alien species*

Due to the current budgetary shortages, no research on invasive alien species has been undertaken so far, and thus no data are available. The American mink (*Neovison vison*) could possibly be threatening numerous wild species (e.g. birds) in some regions, while non-native invasive plant species (e.g. tree and saxaul species) are imported from China for tree planting and land rehabilitation of mining areas in the Gobi region.

#### *Vegetation belts and regions*

Six vegetation belts and zones are distinguished: the high mountain (alpine) vegetation belt (3.6 per cent of the country), mountain taiga belt (4.5 per cent), mountain forest steppe (15.2 per cent), steppe zone (34.2 per cent), semi-desert zone (23.4 per cent) and desert zone (19.1 per cent).

Mongolian territory is divided on the basis of physiography, soil and climate into 16 vegetation regions. The composition of the vegetation cover of Khangai Mountain Forest Steppe, Mongolian Altai Mountain Steppe, Khentii Mountain Taiga and Daguur Mountain Forest Steppe is comparatively richer in plant species than of other regions (table 11.1). Although boreal regions, deserts and high mountain areas, each offering specific environmental conditions for vegetation, might not be particularly rich in terms of species diversity, they often harbour very rare and endemic species, which can easily become extinct if their habitats are not conserved.

#### *Ecosystems and ecoregions*

Mongolia harbours vast areas of relatively unspoiled natural habitats, including alpine habitats in the Altai and other high mountains in western and central Mongolia, extensive coniferous boreal forests, steppe grassland, and semi-desert and desert habitats, as well as freshwater and saline wetlands. These habitats support globally important populations of a large number of wildlife species, many of which have undergone massive declines elsewhere. For instance, the Daurian Steppe constitutes the most undisturbed steppe ecosystem in the world, supporting viable populations of steppe-dependent large ungulates and birds, many of them considered nearly extinct in other regions of the world.

**Table 11.1: Diversity of flora in vegetation regions**

Vegetation region	Percentage	Plant species (number)
Khuvsgul Mountain Taiga	4.96	886
Khentii Mountain Taiga	3.05	977
Khangai Mountain Forest Steppe	17.59	1214
Daguur Mountain Forest Steppe	6.6	946
Khovd Mountain Steppe	1.98	657
Mongolian Altai Mountain Steppe	7.02	1020
Khangai Mountain Steppe	0.87	465
Middle Khalkha Steppe	11.54	509
Eastern Mongolian Steppe	3.94	539
Desert Steppe of Great Lakes Depression	6.11	666
Desert Steppe of Valley of Lakes	3.18	346
Desert Steppe of Gobi-Altai Mountains	5.02	710
Desert Steppe of Eastern Gobi	9.35	327
Alashaa Gobi	6.43	183
Trans-Altai Gobi	5.72	326
Jungarian Gobi	1.62	483

Source: Fourth National Report on Implementation of the Convention on Biological Diversity, 2009.

As many as 19 natural ecosystems (15 matrix and 4 patch ecosystems) can be distinguished in terrestrial and aquatic biomes of Mongolia: 4 ecosystems in the high mountain biome (alpine tundra, alpine meadow, high mountain steppe and sub-alpine woodland), 2 in the forest biome (boreal coniferous forest and sub-boreal mixed forest), 4 different types of steppe ecosystems (meadow steppe, moderate dry steppe, dry steppe and desert steppe), 3 desert ecosystems (semi-desert, true desert and extreme arid desert), two aquatic ecosystems (lake, perennial rivers and floodplains) and 4 patch ecosystems, covering numerous but small areas (intermittent rivers and ephemeral channels, closed depressions and salt banks, sand dunes and glaciers). The twentieth, human-made, ecosystems are industrial and urban areas, and cultivated agricultural land. The four steppe ecosystems are the "flagship" ones, dominant in the landscape of Mongolia and most widespread. Each steppe ecosystem type covers more than 10 per cent of the country, and all four together encompass more than half the territory of Mongolia.

In 2010, WWF Mongolia conducted a comprehensive in-depth assessment of gaps in biodiversity protection, and applied a wider ecoregional approach to facilitate better integration of national conservation and regional development policies and plans (annex IV, map 3). WWF Mongolia consolidated 16 smaller vegetation regions into four large ecoregions: Altay-Sayan (23.1 per cent of the territory of Mongolia), Hangay (16.4 per cent), Daurian Steppe (28.2 per cent) and the Central Asian Gobi Desert (32.3 per cent), each of them comprising a number of smaller ecoregions, as defined by WWF International.

The Altay-Sayan ecoregion includes six smaller ecoregions: Altay montane forest and forest steppe, Altay alpine meadow and tundra, Great Lakes Depression desert steppe, Sayan alpine meadow and tundra, Sayan montane coniferous forest and Sayan intermontane steppe, together encompassing 17 of Mongolia's 19 natural ecosystems. This ecoregion has high biological diversity and includes large tracts of larch and pine forests considered virgin. It supports important rare fauna species, e.g. Siberian musk deer, Siberian ibex, argali sheep, snow leopard, goitered gazelle, Dalmatian pelican and the endemic Mongolian saiga. In 2010, as much as 14 per cent of this ecoregion had already been included in the state protected area network, although in a quite fragmented pattern.

The Hangay ecoregion is situated in the central part of the country, and includes three smaller ecoregions: two in the Hangay Mountains (Hangay Mountains alpine meadow, Hangay Mountains coniferous forest), and the Selenge-Orkhon forest steppe in the Orkhon and Selenge River basins. This ecoregion is rich in species and encompasses all 15-matrix ecosystems of Mongolia. Coniferous forests, mainly larch, are found on the northern slopes of the Hangay Mountains while the southern slopes are covered with steppe vegetation. In 2010, only 7.9 per cent of this ecoregion was covered by the state protected area network.

The Daurian Steppe ecoregion, stretching over 28.2 per cent of the territory of Mongolia in the eastern part of the country, includes three smaller ecoregions: Trans-Baikal coniferous forest, Daurian forest steppe, and Mongolian-Manchurian grassland, together

encompassing all natural ecosystems identified for Mongolia. Much of the ecoregion consists of nearly flat or rolling hills landscape, while mountains are present only in its northern part. Lakes and wetlands in the lower altitudes provide habitats for numerous bird species, including as many as six crane species (including the white-napped crane), while the flagship species of the vast grassland habitats are the great bustard, Mongolian gazelle and Mongolian marmot. In 2010, 9.6 per cent of the Daurian Steppe ecoregion area was under the state protected area network.

The Central Asian Gobi Desert ecoregion located in the southern part of Mongolia includes four smaller ecoregions: the Alashan Plateau semi-desert, Eastern Gobi Desert steppe, Gobi Lakes Valley desert steppe and Dzungarian Basin semi-desert. The whole region is dominated by different types of desert ecosystems. The vegetation includes steppe plant species, low grasses, drought-resistant shrubs and saxaul forests (the latter in lower elevated areas, in oases and along the dry riverbeds), including many endemic plant species and a large number of endangered species. Fauna includes the Gobi bear, Asiatic wild ass, wild Bactrian camel, goitered gazelle and Mongolian gazelle, as well as reptile species endemic to Central Asia: the plate-tailed gecko, Gobi naked-toed gecko and Tatory sand boa. Mountains in the northern part of this ecoregion support populations of snow leopard, argali and ibex. This ecoregion had the highest area coverage by the state protected area network (21.4 per cent) in 2010, including well-designed and strictly protected areas of adequate size, providing for the highest conservation regimes and standards.

#### Major threats to the ecoregions

Major threats in the Altay-Sayan ecoregion include the deterioration of habitats due to overgrazing and overharvesting of biological resources (timber, wildlife). The Hangay ecoregion is densely populated, compared with other regions of Mongolia. In recent decades, many rural people settled here in search of better livelihoods linked to agricultural opportunities, urban development and better infrastructure, which resulted in still increasing threats to biodiversity, such as overgrazing, forest fires, illegal logging and artisanal mining. The main threats for the Daurian Steppe ecoregion and its wildlife are climate change, ongoing degradation of the grasslands as a result of overgrazing, in particular by goats, excessive hunting, overfishing, mining and oil extraction and associated infrastructure development.

The main threat to the Central Asian Gobi Desert ecoregion (still increasing due to current climate changes) is the scarcity of natural water sources,

which are critically important for the survival of both resident and migratory wildlife populations, leading to competition for water, due to the high concentration of people and domestic livestock in oases. Other threats include overgrazing and the resulting desertification of rangelands caused by an increased number of goats, uncontrolled motor vehicle use, and increasing mining activities, which are not only degrading natural habitats but, additionally, resulting in growing demand for associated infrastructure development, leading to habitat fragmentation and isolation of wildlife populations.

#### *Assessment*

Even though the vast and sparsely populated mountain, steppe and semi-desert areas of Mongolia are a globally important wildlife refuge, harbouring viable large mammal populations (in particular of ungulate species), throughout the last three decades, Mongolia has experienced rapid declines in the populations of numerous key mammal species. These declines seriously affected populations of mammal species globally threatened by extinction, such as the Mongolian saiga antelope, as well as species with favourable conservation status worldwide, but recently becoming rare, such as the red deer and the argali sheep.

The integrity of almost all natural ecosystems in each of Mongolia's four ecoregions is currently threatened, as a result of both natural factors (such as climatic changes) and growing anthropogenic pressures, including overgrazing of rangelands, overharvesting of biological resources, expanding mining activities and associated infrastructure development.

#### **11.2 Performance and gaps in biodiversity monitoring networks**

The environmental monitoring system was established in 1977, but the legislation did not require collecting information on biodiversity or nature conservation, nor on protected areas, nor on wild plant and animal species. Since its establishment in 1987, the authority responsible for environment used to commission periodic (four-yearly) nationwide surveys and wildlife censuses, assessing the current population size of wildlife species of different biomes (steppe and desert, mountains, forest), targeted at species considered economically important (e.g. argali sheep, ibex) or ecologically important (e.g. the Mongolian gazelle). The last nationwide assessment of species of different biomes was carried out in 2010, and was not repeated in 2014, due to the budgetary shortages since 2012. For the same reason, no research on invasive alien

species has been undertaken to date, and no data is available.

Data on plant species and communities, and on animal species and their populations, are gathered from a range of scientific field research, most often carried out on a project basis by national and international scientific institutions (e.g. the National University of Mongolia, the Institute of Biology of the Mongolian Academy of Sciences, the Mongolian National University of Education), research and conservation organizations (e.g. the Zoological Society of London, the Snow Leopard Trust), individual researchers, environmental NGOs (e.g. the Mongolian Association of Conservation for Nature and the Environment, Wildlife Science and Conservation Centre of Mongolia, Mongolian Ornithological Society), and international environmental organizations (Wildlife Conservation Society, the Nature Conservancy, WWF). These are supplemented by observations made on a daily basis by rangers of the state protected areas and the environment and tourism departments of the aimags, despite the fact that the field services generally lack modern equipment, skills and experience in using modern monitoring techniques.

Available data on the number of flora species should be interpreted with caution, as different statistics, official reports and policy documents sometimes provide either unreliable or not the most up-to-date information. New species are still recorded in the course of ongoing field research and nature inventories. For instance, in 1989, only 2,443 species or subspecies of vascular plants were identified, while in 2015, this number had already risen to 3,127 (only in the last few years, as many as 292 "new" vascular plant species or subspecies were recorded in Mongolia). Experts involved in the elaboration of the Red List and Summary Action Plans for Mongolian Plants helped to develop the Mongolian Biodiversity Databank for the plants.

#### *Assessment*

The capacities for carrying out biodiversity monitoring on a regular basis are seriously impaired by the lack of funding, equipment and trained personnel.

### **11.3 Trends in development and management of protected areas**

Mongolia has a long tradition of establishing protected areas, dating back to the designation of three protected sacred mountains by Chinggis Khan in the early 13th century. The "Khalk Juram" Law (1709) designated 14 mountains (including Bogd Khan, Khan-Khenti,

Khugnuukhaan and Tuvkhunkhaan) as protected from hunting, logging and cultivation. One of the three sites protected since the 13th century, Bogd Khan Mountain (located south of Ulaanbaatar) was designated in 1778 as a strictly protected area and granted governmental protection, by a prohibition on logging and hunting (similar protective regimes were imposed in 1818 on Otgontenger and Bulgan Mountains).

#### *Protected area system*

The 1994 Law on Special Protected Areas (SPAs) defines four categories of protected areas, constituting the state system of protected areas: a strictly protected area (StrPA), national park (NP), nature reserve (NR) and monument. The last category includes historical and cultural monuments, and natural monuments (NMs). The protected area system also includes local protected areas (LPAs), i.e. areas taken under special protection at the local level.

#### Development of protected areas

The development of the state SPA system was slow at the beginning. In 1957, the protected status of the Bogd Khan Uul StrPA (established in 1778 on 41,651 ha) was confirmed, and two relatively small nature reserves were added, bringing the total area under protection to 66,400 ha (0.042 per cent of the territory of Mongolia). In 1965, nine protected areas covered 236,200 ha (0.17 per cent of Mongolian territory). In 1976, the Great Gobi StrPA was designated, so that the total area under protection reached as much as 5,547,900 ha (3.52 per cent of the country's territory).

The rapid increase in the rate of protected area network expansion begun in the 1990s, when environmental protection was given high priority by the Government. Following the 1992 Rio Conference, the Government set the ambitious goal to increase the areas under protection to 30 per cent of the entire territory of the country. In 1992, seven large-scale protected areas (six StrPAs and one NP) were designated, followed in 1993 by another 12 (four StrPAs, five NPs and three NRs). As a result, in 1993, Mongolia already had 26 protected areas encompassing 12,629,800 ha, amounting to 8.01 per cent of the country's territory. Upon reaching 21,731,500 ha (13.8 per cent) under protection in 2000, the expansion of the state SPA system slowed down, which was compensated for to some extent by the rapid spatial increase of the nationwide network of LPAs. In 2012, the state network consisted of 99 protected areas, together covering 27,207,800 ha (17.4 per cent of the country's territory), and was later

further extended by adding two new state SPAs in 2017.

In 2017, the state SPA system includes 20 StrPAs encompassing a total area of 12,411,057.44 ha (7.93 per cent of the country's territory), 32 NPs encompassing a total area of 11,884,605.59 ha (7.6 per cent), 36 NRs encompassing a total area of 3,528,824.17 ha (2.26 per cent) and 14 NMs encompassing a total area of 128,962.78 ha (0.08 per cent). In total, the system encompasses 27,953,449.98 ha (17.87 per cent of the country's territory), apart from buffer zones and LPAs designated by the local authorities. Thus, the state network of protected areas (annex IV, map 4 and table 11.2), stretching over 279,534 km<sup>2</sup>, exceeds the size of many countries.

However, data on the size of the state protected areas may not always be accurate; according to the most recent GIS assessments, the official statistics often underestimate the actual total areas. Moreover, there are still overlaps in statistics between the state protected areas and LPAs (in 2009, the area of spatial overlaps accounted for 929,202 ha in total, or almost 6 per cent of the LPA system at that time). Such overlaps can easily be explained when LPAs are incorporated into the state SPA system (e.g. the 222,820 ha of Bayankhongor Aimag-designated LPAs included in Ikh Bogd Uul National Park in 2007), but they are still indicated in the local statistics.

The cumulated data for both the state SPA system and the LPA network indicate that, in 2017, Mongolia had no fewer than 1,210 protected areas with a total area of 46.79 million ha (29.91 per cent of the country's territory).

### State special protected area system

Strictly protected areas (IUCN protected area management categories Ia and Ib) are wilderness areas in which natural conditions and ecological processes are exceptionally well preserved, and where human interference or use are seriously restricted. The StrPA functional zoning pattern includes the "pristine (core) zone", where only passive protection measures and research (not affecting the natural state) are allowed. The second, "conservation zone" additionally allows undertaking some active conservation measures (e.g. recovery of damage caused by natural disasters). The third, "limited use zone" allows for a much wider range of active conservation measures (e.g. restoration of soil and plant cover, or forest maintenance and cleaning), non-commercial collection of medicinal plants and NTFPs by local residents, the practising of religious activities, and tourism. Mining, logging, hunting and construction are prohibited in all three zones. Each StrPA is required to have an administration, established by the state central administrative body in charge of SPAs. An outer "buffer zone" surrounding the StrPA has to be designated where local governors are responsible for the development and implementation of a buffer zone management plan, in cooperation with the StrPA administration and Buffer Zone Council.

As for size, very few StrPAs are smaller than 100,000 ha, e.g. one of the oldest StrPAs, Khasagt Khairkhan, established in 1965, encompasses 27,448 ha. Some StrPAs exceed 1 million ha in size, e.g. the Great Gobi StrPA (divided into two separate parts, A and B), established in 1975, encompasses a total area of 5,311,730 ha (or 5,565,642 ha, according to recent GIS measurements), which is equivalent to 3.4 per cent of Mongolian territory.

**Table 11.2: State and local protected areas, 2017**

Protected area category	Number	Total area (ha)	Share (%)
State protected areas	102	27 953 449.98	17.87
Strictly protected area	20	12 411 057.44	7.93
National park	32	11 884 605.59	7.6
Nature reserve	36	3 528 824.17	2.26
Monument	14	128 962.78	0.08
Local protected areas	1 108	18 837 459.75	12.04
<b>Total</b>	<b>1 210</b>	<b>46 790 909.73</b>	<b>29.91</b>

Source: Ministry of Environment and Tourism, ECE secretariat calculations.

National parks (IUCN protected area management category II) are areas in which natural conditions are relatively well preserved, and which have important historical, cultural, scientific and educational values. Similarly to StrPAs, NPs have three functional zones: the "pristine (core) zone", where only research and conservation measures are permitted, the "tourist zone", where, additionally, tourism and fishing are allowed and the "limited use zone", where traditional livestock herding, tourist infrastructure development and construction (with park administration permission) are also allowed. Mining, logging and hunting are prohibited in all three zones. Similarly to StrPAs, NPs are required to have an administration unit and a buffer zone with a management plan; the only difference is that the buffer zone for an NP may be established either outside or overlapping its "limited use zone".

The NPs vary in size; less than one third of NPs are smaller than 100,000 ha, while some others are either close to, or exceed, one million ha. The largest, Govi Gurvan Saikhan NP, encompasses 2,697,170.84 ha (1.72 per cent of the territory of Mongolia).

Nature reserves are established with the purpose of ensuring conservation and restoration of certain features and natural resources. They are divided into five types: ecosystem (protecting natural conditions), biological (protecting rare flora and/or fauna species), paleontological (conserving areas of fossil occurrence), geological (protecting important geological formations, their exposure and structures), and water (aimed at preserving the source of rivers and water). Only traditional economic activities are allowed in NRs, provided they cause no harm to core values. This is why Mongolian NRs do not match IUCN category Ia (strictly protected nature reserves), but, due to their size, often resemble IUCN category Ib (wilderness areas), which allow the use of resources by indigenous communities. Mining, hunting, logging and construction is explicitly prohibited. NRs are not required to have an administration unit, the governor of the respective aimag, capital city, soum or district is in charge of managing the protection of NRs. NRs are not divided into zones, but an external buffer zone can be established, if necessary, by the soum or khoroo's citizen representative khural.

Despite their relatively strict conservation regime, NRs are quite large in size; eight NRs exceed 100,000 ha, e.g. Tost-Toson Bumbyn Nuruu NR, established in April 2016, encompassing 743,057.93 ha.

Monuments (IUCN protected area management category III) are established to protect sites important for research and for sightseeing purposes. Natural

monuments (NMs) preserve unique landscape features and formations (e.g. waterfalls, cliffs, canyons, caves, rocks, oases, dunes), while historical and cultural monuments protect sites harbouring, for example, ancient human dwellings, cave paintings or rock inscriptions and petroglyphs, historical monuments, tombs, ruins, mountains related to traditional rituals, and worshipped or historical places. Some restricted uses of the monument area are allowed, provided they cause no harm to its core values. Land cultivation and mining are explicitly prohibited in monuments. Similarly to NRs, monuments are not divided into zones, and are not required to have an administration; their management is entrusted to the relevant local authority (at aimag, capital city, soum or district level). The same rules apply regarding an external buffer zone as is the case for NRs.

As for size, only two monuments are smaller than 1,000 ha. The largest Mongolian monument, Dayandeerkhiin Agui, covers 31,277.21 ha.

#### Local protected area network

In parallel to the state SPA system, the LPA network is in place. The Law on Special Protected Areas states that an aimag, capital city, soum or district may take certain areas within their territorial jurisdictions under local special protection, and empowers aimag or soum citizen representative khurals to designate LPAs, delineate their boundaries and define applicable protective regimes.

The need for such a complementary network of protected areas is well justified by the natural conditions of Mongolia and the needs of wide-ranging animal species, which require vast tracts of intact habitats to survive, and migration corridors, to ensure genetic exchanges between populations. Simultaneously, areas remaining outside the state SPA system are shared and extensively used by local inhabitants, including traditional semi-nomadic and nomadic herders' communities, which are fully dependent on the biological resources of these lands and are thus motivated to use them in a sustainable manner.

The state SPA system cannot incorporate all ecologically important areas; biodiversity conservation has to be balanced with the social and economic needs of local inhabitants. Therefore, creating an ecologically viable conservation system requires extending nature conservation activities far beyond the boundaries of the state SPA system, to the lands inhabited and used by rural communities, simultaneously providing local stakeholders with tools for sustainable management of these lands.

The purpose of designating an LPA is to protect ecosystem stability and promote sustainable land use in areas of natural, historic and cultural significance. Depending on the main subject of protection, LPAs are classified as either forest, wildlife, plant and water reserve land, or natural and historical heritage reserve land. If necessary, LPAs can be divided into protective and limited use zones. Most probably, protective regimes applied in LPAs resemble IUCN protected area management categories Ib (large wilderness areas, where local communities can use resources in ways compatible with conservation objectives) and VI (vast protected areas conserving ecosystems and habitats, together with associated cultural values and traditional natural resource management systems), both of which allow for community-based natural resource management, which is traditional for Mongolia and promoted by the CBD.

The designation of LPAs by local authorities is only temporary, valid for not more than 10 years. But once the stated protective regime period expires, it can be prolonged. Thus, the number of LPAs constantly changes. Furthermore, as the information flow between the local and central levels is often slow, there are instances when the Ministry of Mining and Heavy Industry issues a mining concession within an LPA.

The development of the LPA network was initially quite slow, with from one to a maximum 15 new LPAs designated per year between 1988 and 1999. Since 2000, the number of newly designated LPAs rapidly increased (e.g. 119 new LPAs in 2000, 180 in 2007) while, at the same time, the expansion of the state SPA system slowed down considerably. Thus, the vast majority of current LPAs were established after 1 January 2000. Another significant increase in the number of newly designated LPAs was recorded between 2013 and 2016 (125 in 2013, 374 in 2014, 576 in 2015 and 348 in 2016). Such a high number of LPA designations per year resulted in criticism of this system, as the feasibility of carrying out thorough nature inventories and assessments, proving that proposed sites are important for conservation, could easily be questioned. Similarly, the feasibility of

carrying out required formal procedures for so many newly designated LPAs was questioned. This criticism led to the accusation that, in some LPAs, the incentives could have been other than ecological, i.e. that LPA designation was used to restrict the access of other community groups to attractive livestock grazing areas, or to force mining companies to pay for the "degazetting" of LPAs, in order to gain access to mineral deposits once the validity period expired.

The size of LPAs usually varies between 1 and 100,000 ha, but more than 40 LPAs are larger and together constitute more than half the total area of LPAs. Due to the lack of a modern, nationwide digital information system, available statistics cannot provide accurate data on the number and area of LPAs, as the information on the designation of LPAs and expiration or extension of their protective status is not always immediately communicated to the central authorities. This is why the EIC provides two parallel LPA databases, one of all known LPAs (including those with unclear legal protective status or boundaries) and another of LPAs with confirmed status and boundaries. For instance, in 2015, Mongolia had 2,362 LPAs (including 919 designated by aimags and 1,443 designated by soums), covering 57.9 million ha (37.1 per cent of the country's territory). However, the status of 978 LPAs was unclear, as were the boundaries and area of 681 LPAs. For this reason, the second database presents only 1,103 confirmed and thus "non-disputable" LPAs, covering 17.7 million ha (11.36 per cent of the country's territory).

The largest LPAs are: Khangain Bus LPA (989,126 ha) in Bayankhongor Aimag; an LPA (863,271 ha) under the title "Along the state border in the southern soums of the Ömnögovi Aimag"; and Zotol Khan Uul LPA (530,942 ha) in Sükhbaatar Aimag. Some of the aimags decided to designate considerable areas as LPAs, covering large parts of their territories. In 2017, five aimags harbour the largest areas designated as LPAs (about 13 million ha (table 11.3) or 8.25 per cent of the country's territory) and have the highest share of LPAs in their territory.

**Table 11.3: Aimags with the largest area of LPAs, 2017**

Aimag	Number	Area (ha)	Share of aimag territory (%)
Ömnögovi	69	3 976 878.65	24.05
Sükhbaatar	78	2 637 860.74	32.06
Govi-Altai	117	2 471 075.35	17.47
Dundgovi	99	1 997 248.28	26.74
Khentii	350	1 850 253.21	22.47
<b>Total</b>	<b>713</b>	<b>12 933 316.23</b>	

Source: Ministry of Environment and Tourism, 2017.



According to the Ministry of Environment and Tourism, the LPA network in 2016 included 1,108 LPAs (omitting the uncertain ones), encompassing a total area of 18,837,459.75 ha (12.04 per cent of the country's territory).

### *Buffer zones*

Buffer zones surrounding SPAs are designated by local authorities. Their role is to minimize, eliminate and prevent actual and potential adverse impacts on protected areas, but also to increase public participation in nature conservation initiatives and secure the livelihoods of the local residents. Local governors are in charge of the development and implementation of management plans aimed at conservation of these buffer zones. Such locally designated, managed and funded buffer zones could probably be perceived as another, separate, "BZ" category of LPAs. However, almost no information is available on "buffer zones", which are neglected in official statistics and databases. The buffer zones of some SPAs (e.g. of seven StrPAs: Dornod Mongol, Great Gobi parts A and B, Khan Khentii, Khasagt Khaikhan Mountain, Mongol Daguur, Numrug, Uvs Nuur Basin, and of five NPs: Altai Tavan Bogd, Gobi Gurvan Saikhan, Gorkhi-Terelj, Hustai Nuruu, Khar Us Nuur) have officially been approved by the Ministry of Environment and Tourism. The total area of all SPA buffer zones is estimated at some 15 million ha. However, it is not clear to what extent these buffer zones overlap with the LPAs and with "limited use zones" of NPs.

### *Natural sacred sites*

Sacred sites include natural sites (such as mountains, lakes and groves) and cultural sites (e.g. monasteries, deer stones or petroglyph occurrence sites, or ancient funeral sites). In 2009, there were 47 natural sacred sites in the 21 aimags of Mongolia (and in Ulaanbaatar, the capital city), including 3 designated at the national level by presidential decree, 34 designated at the aimag (or capital city) level, and 10 natural sacred sites jointly designated by several neighbouring aimags. The two aimags with the largest number of natural sacred sites are Khövsgöl and Övörkhangaï (which each have four natural sacred sites). As many as 16 natural sacred sites are located in protected areas belonging the state SPA system, with a further eight inside LPAs. Due to the fact that sacred sites are often small, and that their boundaries are not always officially delineated, the area of 47 natural sacred sites is not indicated in table 11.2.

## *Management*

### Management plans

Even though there is no legal requirement for developing management plans for SPAs, the Ministry of Environment and Tourism expects all state SPAs to have management plans approved by the Minister, and has the mandate to reject proposed drafts, e.g. if no consultations with the local stakeholders took place.

Initially, the planning process was not always successful and only a few SPAs had valid management plans. The first one was approved for Khuvsgul NP in 1998, then for Numrug StrPA in 2001, Hustai Nuruu NP in 2002 and Khar Us Nuur NP in 2002/2006, while proposed management plans for Khan Khentii, Gobi Gurvan Saikhan, Eastern Mongolia protected areas and Uvs Nuur Basin StrPA were initially rejected by the Ministry. Later, numerous training courses on management planning, targeted at protected area specialists, were organized in the frame of various internationally supported projects in order to assist protected area planning. Some management plans (or proposals for such) were developed with international assistance, e.g. the plans for Khuvsgul NP and Khar Us Nuur NP were drafted under WWF projects, and those for Eastern Mongolia StrPA and Mongol Daguur StrPA under a joint WWF-UNDP project.

In 2010, only seven StrPAs (Bogdkhan Mountain, Dornod Mongol, Great Gobi, Khan Khentii, Mongol Daguur, Numrug and Uvs Nuur Basin) and 10 NPs (Altai Tavan Bogd, Dariganga, Gobi Gurvan Saikhan, Gorkhi-Terelj, Hustai Nuruu, Khangai Nuruu, Khan Khohii-Khyargas Nuur, Khar Us Nuur, Khorgo Terkhiiin Tsagaan Nuur, Khuvsgul) had valid management plans (as did Nagalkhaan NR). Management plans for many other state SPAs have been developed since 2010, often with international funding support. Similarly, the management plan of Khavtgar LPA was developed in 2007 with the support of GIZ under the programme Conservation and Sustainable Management of Natural Resources.

### Protected area administration system

StrPAs and NPs are managed by 33 protected area administrations (PAAs), each of them responsible for one or more protected areas (PAA status has also been given to the special Takhi Reintroduction Research Centre), while NRs and NMs are managed by aimag governments and soum authorities.

The legislation provides the opportunity for NGOs to manage protected areas of different categories on a contract basis. For instance, contracts for co-

management of Hustai Nuruu NP were officially signed with the Mongolian Association of Conservation for Nature and the Environment (for the period 1993–2003), and with the local Hustai Nuruu NP Trust (since 2003). Similar management contracts between aimag citizen representative khurals and NGOs or herder group associations are often used in the case of NRs, monuments and LPAs. For example, the Argali Research Centre and Mongolian Conservation Coalition co-manage the Ikh Nart NR, the "Gulzat" NGO manages Gulzat LPA in Uvs Aimag, and "Khavtgar Shiree" NGO manages Khavtgar LPA in Khentii Aimag.

*Gaps in the protected area system in terms of ecosystem coverage and species conservation*

In 2010, a report presenting outcomes of a thorough gap analysis of Mongolia's state SPA system was published by WWF Mongolia. It summarizes and consolidates outputs of several research projects carried out in the period 2007–2009 by WWF Mongolia, the Nature Conservancy and other environmental organizations, in cooperation with the ministry responsible for environmental issues, under three projects funded by the MAVA Foundation, WWF Netherlands, GEF and UNOPS.

This gap analysis demonstrated that, in 2010, the state SPA system was ecologically inadequate, in terms of both size and inclusion, and that seven of the 19 natural ecosystems were underrepresented. The best protected were ecosystems not suitable for economic use, as state SPAs encompassed 79.39 per cent of the territory covered by glaciers, 74.18 per cent of extreme arid desert ecosystem areas and 40.73 per cent of alpine tundra areas. These ecosystems are not common in Mongolia and cover only 4.64 per cent of the country in total. Three ecosystems with forest vegetation (together covering 7.52 per cent of the country) were relatively well protected, as the state SPA system harboured as much as 31.42 per cent of boreal coniferous forest, 15.62 per cent of sub-alpine woodland and 9.96 per cent of sub-boreal mixed forest ecosystem. However, the four steppe ecosystems had the smallest protected area coverage (7.62 per cent of the meadow steppe, 5.39 per cent of the moderate dry steppe, 4.24 per cent of the dry steppe and 6.59 per cent of the desert steppe ecosystem), despite the fact that they jointly cover 55.42 per cent of the country and are the most representative of Mongolia.

The gap analysis was performed for all 19 natural ecosystems in each of the four ecoregions, and for potential habitats of key wildlife species for particular ecoregions. Significant disproportions in ecosystem coverage by the state SPA network between the four

ecoregions were reported. For instance, forests in the Hangay ecoregion were least protected. In 2010, the state SPA system coverage of different ecoregions accounted for 7.9 per cent of the Hangay, 9.6 per cent of the Daurian Steppe, 14 per cent of the Altay-Sayan and 21.4 per cent of the Central Asian Gobi Desert ecoregions.

Findings of this report are of fundamental importance for further improvement and extension of the protected area system. However, when assessing the levels of protection provided by the state SPA system to different areas and natural ecosystems, an obvious methodological error was made by assigning a higher "Level IV" to limited use zones of NPs (where tourist infrastructure development and permanent settlement construction are allowed) and a lower "Level V" to all NRs and NMs (where such activities are prohibited). As a result, those analyses, statistics and findings regarding coverage of the territory and ecosystems by different levels of protection are erroneous.

Nevertheless, despite the fact that the vast majority of Mongolian protected areas encompass huge territories, the highest protection level is often granted to very small portions of a protected area. Furthermore, due to the fact that traditional grazing is allowed in a considerable part of the protected area network (e.g. in limited use zones of NPs, NRs and LPAs), the pressure on wildlife habitats is considerable and still increasing. Therefore, in many cases, the current zoning pattern of protected areas does not adequately safeguard the biodiversity values.

*Planned extension of the special protected area system*

In 1992, Mongolia set a goal to provide legal protection to 30 per cent of its territory, which was later reiterated in the 1996 National Biodiversity Action Plan and the 1998 National Programme on Special Protected Areas, without setting an exact timeframe. When setting its national MDGs (2005 Resolution of the State Great Khural No. 25), Mongolia included the commitment to achieve the country-specific MDG target to have 30 per cent of its territory included in the SPA system by 2015, specifying that 15 per cent would be included as LPAs. The 2003 Master Plan for Land Management (2003 Government Resolution No. 264) provided for 24.2 million ha to be included in the SPA network and defined 75 areas for inclusion in the state SPA network.

The Government perceives the planned extension of the SPA system as its contribution towards the implementation of the CBD. Many recent documents

and publications of the Ministry of Environment and Tourism mention 2030 as the deadline for achieving the MDG 30 per cent indicator value. Surprisingly, such a commitment is no longer present in the current National Biodiversity Programme for the period 2015–2025. Instead, until 2025, at least 30 per cent of each ecosystem is to be covered by the expanded SPA network. In fact, the national MDG target has almost been achieved, as 30 per cent of the territory is equal to some 46.9 million ha, while the state SPA network together with the LPAs already cover almost 46.8 million ha in 2017 (table 11.2).

Moreover, the SoER for 2015–2016 presents three phases of the planned system extension: by 90 new areas covering 24,754,228 ha in Phase I (2016–2020), a further 47 areas of 9,519,045 ha in Phase II (2021–2025) and 78 areas covering 8,952,356 ha in Phase III (2026–2030). It implies that the current state SPA network (102 areas covering 27,953,450 ha, 17.87 per cent of the country's territory) is to be extended by 215 new areas covering 43,223,829 ha. Should such ambitious plans be implemented, in 2030 the protected area network would include 317 areas encompassing 71,177,279 ha, which would then account for as much as 45.50 per cent of the territory of Mongolia.

Most recently, the 2016 SDV 2030 set the commitment to "Preserve the natural landscape and biodiversity, and ensure sustainability of the ecosystem services" by setting the following timeframe: in Phase I (2016–2020) the area of SPAs should be increased to 25 per cent, in Phase II (2021–2025) to 27 per cent, and in Phase III (2026–2030) to 30 per cent of the country's territory. Although SDV 2030 refers to "specially protected areas", which implies both state SPAs and LPAs, the actual intention is to extend the state-designated and state-protected network of protected areas to 30 per cent by 2030. Otherwise the indicated targets make no sense, as, in 2017, Mongolia already had 29.91 per cent of the country's territory designated as protected areas.

#### *Assessment*

Since the beginning of the 1990s, Mongolia has developed a complex system of protected areas, designated at different administrative levels (central, regional and local), which, in 2017, covered almost 47 million ha, almost 30 per cent of the country's territory. Worth noting is the implementation of the NGO and community-based model of protected area management, which allows, among other things, the reduction of state expenditures on the maintenance of the whole network. However, a considerable part of wildlife habitats and migration corridors of wide-ranging and globally significant species remain in the

"non-protected" 70 per cent of the country that is not planned for inclusion in protected areas.

Management planning is not adequately regulated by the current legislation, and remains a weak point of the system. The structure of management responsibility is complicated, as StrPAs and NPs are either directly managed by the State or by contracted NGOs and herder group associations, while state-designated NRs and NMs, as well as all locally designated buffer zones and LPAs, are managed by the regional and local authorities, at their own expense.

Mongolia is continuously extending its SPA system, which already encompasses 29.91 per cent of the country's territory. However, the protected area network does not yet adequately safeguard the biodiversity values, as several important ecosystems are underrepresented. Moreover, in the case of some protected areas, the current zoning pattern does not provide a sufficient level of protection to important wildlife habitats.

#### **11.4 Protected areas with internationally designated status**

##### *World Network of Biosphere Reserves*

Six areas have so far been nominated as Biosphere Reserves (BRs) under the UNESCO Man and Biosphere (MaB) Programme, aiming at reconciling biodiversity conservation in the core and buffer zones of each BR with sustainable development and use of natural resources in its surrounding transition area (table 11.4). The MaB Biosphere Reserve label does not provide for any additional protective status for the site, other than is already granted by national legislation. Thus, the protective legal status of the core zone is the prerequisite for applying for a BR nomination. Due to this requirement, all six BRs were established on the basis of existing StrPAs. In total, the six BRs cover 16,078,072 ha, which include 2,064,505 ha under the highest protective regime, equal to 10.28 per cent of the territory of Mongolia.

##### *World Heritage sites*

Five sites have so far been inscribed by UNESCO on the World Heritage List, under the Convention concerning the Protection of the World Cultural and Natural Heritage – three "cultural" and two "natural" sites: the Uvs Nuur Basin (inscribed in 2003) and Landscapes of Dauria (2017), both as transboundary World Heritage sites shared with the Russian Federation. Uvs Nuur Basin includes seven components in Mongolia and five in the Russian Federation, of the total area of 898,064 ha (810,234 ha

or 91.2 per cent in Mongolia and 87,830 ha or 9.8 per cent in the Russian Federation), with additional buffer zones (solely on the Russian side) of 170,790 ha. The Mongolian part also has UNESCO MaB Biosphere Reserve status and is included in the bilateral Mongolian–Russian transboundary protected area. The Landscapes of Dauria site includes three components in Mongolia and two in the Russian Federation, of the total area of 912,624 ha (633,541 ha or 69.4 per cent in Mongolia and 279,023 ha or 30.6 per cent in the Russian Federation), with an additional buffer zone of 307,317 ha. The Mongolian part includes Mongol Daguur StrPA and Ugtam NR.

A further 12 areas have been indicated for the Tentative List by Mongolia, including three properties to be inscribed according to the World Heritage natural criteria and one "mixed" (both natural and cultural criteria). Three potential sites encompass protected areas: the Desert Landscapes of the Mongolian Great Gobi (on the Tentative List since

2014) include Great Gobi StrPA parts A and B, and Small Gobi StrPA part B (jointly covering almost 6.2 million ha); the Eastern Mongolian Steppes (2014) include Dornod Mongol StrPA, Toson Khulstai NP, Bayantsagaan Steppes NR and Yakhi Nuur NR; while the Highlands of Mongol Altai (2014, mixed criteria) include Altai Tavan Bogd NP and Siikhem Mountain National Park parts A and B. Another considered natural property, "Cretaceous Dinosaur Fossil Sites in the Mongolian Gobi", includes 13 small sites.

#### Ramsar network

To date, 11 areas have been designated by Mongolia as Wetlands of International Importance under the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (table 11.5). These 11 Ramsar sites cover 1,439,530 ha in total. Only part of these 11 Ramsar sites are protected under the state SPA system or LPAs.

**Table 11.4: Biosphere reserves**

Reserve	Establishment (year)	Area (ha)	Core zone (ha)
Great Gobi	1990	5 300 000	985 000
Bogd Khaan Uul	1996	67 300	41 651
Lake Uvs Basin	1997	771 700	366 080
Hustai Nuruu	2002	778 000	50 000
Dornod Mongol	2005	8 429 072	570 374
Mongol Daguur	2007	732 000	51 400
<b>Total</b>		<b>16 078 072</b>	

Source: UNESCO, 2017.

Note: Lake Uvs Basin is also a Ramsar site (since 1998) and was inscribed on the World Heritage List as Uvs Nuur Basin in 2003. Mongol Daguur is also part of the Dauria International Protected Area.

**Table 11.5: Ramsar sites**

Site	Year	Area (ha)	Coverage by the network of protected areas
Mongol Daguur StPA	1997	210 000	Partially covered (Mongol Daguur Strictly Protected Area and four LPAs)
Ogii Nuur	1998	2 510	Partially covered (LPAs)
Terhiyn Tsagaan Nuur NP	1998	6 110	Fully covered (Khorgo Trekhiin Tsagaan Nuur Natural Park)
Valley of Lakes	1998	45 600	Partially covered (two LPAs)
Ayrag Nuur	1999	45 000	Partially covered (Khyargas Lake National Park)
Har Us Nuur NP	1999	321 360	Partially covered (Khar Us Lake National Park)
Lake Achit and its surrounding wetlands	2004	73 730	Partially covered (Develiin Aral Nature Reserve)
Lake Buir and its surrounding wetlands	2004	104 000	Partially covered (two LPAs)
Lake Ganga and its surrounding wetlands	2004	3 280	Partially covered (Dariganga National Park)
Lakes in the Khurkh-Khuiten River valley	2004	42 940	Partially covered (LPA)
Lake Uvs and its surrounding wetlands	2004	585 000	Partially covered (Lake Uvs StPA and Tesiin Gol Nature Reserve)
<b>Total</b>		<b>1 439 530</b>	

Source: Ramsar Convention, 2017; BirdLife Asia. Safeguarding Important Areas of Natural Habitat alongside Economic Development (2009).

Note: Mongol Daguur StrPA is also an MaB Biosphere Reserve and part of a trilateral transboundary protected area with the People's Republic of China and the Russian Federation. Lake Uvs is also an MaB Biosphere Reserve and part of a bilateral transboundary protected area with the Russian Federation.

**Photo 11.1: Demoiselle crane**

### *Important Bird Areas*

In 2017, 70 Important Bird Areas (IBAs) have been identified in 18 of Mongolia's 21 aimags, almost half of them (32 IBAs) located in four aimags: Dornod (10), Zakhan (8), Khovd (7) and Khuvsgul (7). All 70 IBAs together cover an area of 8,358,313 ha (5.3 per cent of the country's territory). According to the study by BirdLife Asia and the World Bank, 69 IBAs are important for the protection of globally threatened bird species, while seven IBAs harbour restricted-range bird species. As much as 70 per cent of the IBA network (5,858,813 ha) is protected within state SPAs, while 6.2 per cent (519,341 ha) is covered by LPAs. The remaining 23.8 per cent (1,980,159 ha) is not yet included in the protected area system. Some of these remaining areas have been designated as Ramsar sites, World Heritage sites, or BRs.

### *Assessment*

Mongolia has been proactive in designating the Ramsar sites and seeking international recognition for its natural heritage.

### **11.5 Pressures on species and ecosystems**

Land uptake is an evident threat to biodiversity, due to the growing demand for pastures and the rapid development of the mineral resource-extracting sector (both licensed and artisanal mining). Its consequences include the degradation and loss of pastures and wildlife habitats, and conflicts concerning the protective regimes of existing protected areas and extension of the PA network.

Mining (both licensed and illegal) is another major threat, along with increasing demand for water usage and associated infrastructure development. Habitats of threatened migratory ungulate species, e.g. of the Asiatic wild ass and goitered gazelle, are fragmented by linear infrastructure developments, e.g. the construction of roads and railways. Fenced railroads have similar effects to a border fence, dividing and isolating wildlife populations and preventing their migrations. Road network development increases pressures on remote regions, facilitating access to areas attractive for tourism, hunting and poaching. On the other hand, the absence of paved roads (in particular in the western and eastern regions) results in

uncontrolled penetration, causing wildlife disturbance, and the "multitracking" phenomenon specific to Mongolia: the spontaneous multiplication of new tracks carved by vehicles travelling off road, which, between 1991 and 2001, resulted in the degradation or loss of some 300,000 ha of pastures. Another major threat is the massive deterioration and loss of natural habitats due to pasture overgrazing, as a result of the rapid growth of livestock numbers and the altered species structure of herds. In 2015, the number of livestock in Mongolia reached 56.0 million (24.9 million sheep, 23.6 million goats, 3.8 million cattle, 3.3 million horses and 0.4 million camels). The high proportion of goats (42.1 per cent), which are not traditional in Mongolia, results from the growing demand for cashmere products, and has an adverse impact on steppe ecosystems, as goats eat a wider range of plant species than other livestock, and not only forage more aggressively (often destroying root parts) but also damage the upper soil layer with their sharp hooves, which enhances soil erosion and desertification.

Climate change poses serious threats to the biodiversity of Mongolia, resulting in desertification, habitat degradation, increased threat of steppe and forest fires fatal to ungulate, rodent and bird populations, and increasing scarcity of water sources, which are critically important for the survival of both resident and migratory wildlife populations, leading to competition for water between local people and livestock. Wildlife populations are also affected by the dzud winter weather anomaly, preceded by summer droughts which limit the amount of fodder. The dzud winter weather anomaly may have various different specific characteristics: the "black dzud" results in extreme frost (down to  $-50^{\circ}\text{C}$ ), the "white dzud" results in extreme snowfall, the "cold dzud" means prolonged frosty periods, the "iron/ice dzud" turns rain or melting snow into hard ice cover over the last remains of grass, the "storm dzud" threatens herds by rapid blizzards, while a khavsarsan dzud means the combination of at least two of the above types. The fatal dzud consequence is mass animal starvation, resulting in the rapid decline of both wildlife and domestic livestock populations. In the past, a dzud occurred every 10 years, but recently its frequency has increased; in the last three decades, Mongolia suffered a dzud in less than every four years. A dzud can also repeat itself in subsequent winter seasons, as in the period 1999–2002, when the cumulated loss in livestock was estimated at 11 million head. In 2009/2010, the dzud killed more than 8 million livestock (17 per cent of all livestock) and, in 2015/2016, approximately 1.1 million livestock. Neither data nor estimates on dzud-caused wildlife population declines are available.

Desertification is a major threat in a country where desert and sand dune ecosystems encompass 20.7 per cent of the territory, while a further 66.56 per cent is covered by steppe ecosystems (including high mountain steppe). Decreased precipitation has an adverse impact on environmental conditions in habitats of rare and endangered plant species and on the potential for regeneration of the vegetation, resulting in the reduction of the nutrition base for both livestock and wild ungulates (which are prey for wild carnivorous mammal and bird species). The drying of surface water points and small glacial lakes and the drainage of marshes destroys amphibian habitats.

The development of energy installations and infrastructure does not pose major threats to the biodiversity. However, a few existing small dams and HPPs do impair the upstream migration of fish species, while the planned development of wind farms can increase the mortality rate among bird populations.

Although hunting is relatively well regulated, it should still be considered a threat to several wildlife populations, as hunting or fishing quota for game species (and argali sheep for trophy hunting) are determined in the absence of data on their current population trends acquired through nationwide assessments (last carried out in 2010). Therefore, data on the number of rare animals made available for "special purpose hunting" (published in official statistics) has little value for this report, as proper assessment of whether the given quota provides for sustainable species management is not possible. However, a real threat to wildlife is poaching, for either subsistence purposes or highly profitable illegal trade, including in rare and endangered species, such as the wild Bactrian camel, snow leopard and saiga antelope.

The illegal logging and timber trade (in particular in firewood) is still a problem; however, it has recently been mitigated by the application of the community-based forest management approach (contracting and licensing forest user groups). The collection of NTFPs, e.g. edible, medicinal and aromatic plant species for own purposes or local trade, is regulated, and not yet a real threat on a national scale, although some particular species can sometimes be overharvested in particular regions.

Acidification of rivers, underground water and soil occurs mostly in regions where there are illegal gold mining operations, while the eutrophication of aquatic ecosystems, in particular of smaller lakes, is ongoing on a much larger scale, mostly due to uncontrolled livestock husbandry waste discharge into

watercourses. Water pollution of rivers and lakes threatens the viability of fish, amphibian and reptile populations. The use of pesticides and rodenticides in agriculture, rangeland and pasture management adversely affects bird populations. The increased penetration of wildlife habitats by livestock largely facilitated recent outbreaks of livestock-transmittable diseases, including the Ovine rinderpest disease that recently affected the Mongolian population of saiga antelope. The influence of invasive alien species or GMOs is indeterminate, due to the lack of research, but most probably is not yet significant.

Tourism is not yet a threat. According to the statistical data for 2007–2016, the number of visitors to state SPAs varied between 156,510 in 2009 and 331,583 in 2015 (Mongolian visitors accounted for 274,075 or 82.7 per cent, foreign visitors for 57,508 or 17.3 per cent). Despite the fact that tourist traffic accumulates in a few of the most popular and accessible protected areas, visitors rarely enter core zones. Destinations such as Gorkhi-Terelj NP, Hustai Nuruu NP and Khuvsgul NP are tourist traps, while other protected areas remain deserted. However, the negative effects are the growing amount of solid waste and wastewater at these sites, and the aesthetic pollution of landscapes in NP "limited use zones" by tourism infrastructure. In some NPs, such as Khuvsgul and Gorkhi-Terelj, the impact from tourist vehicles, in particular on land and habitat disturbances, are clearly felt.

#### *Assessment*

The natural conditions of Mongolia are sufficiently challenging for wild species of plants and animals, which fight for survival every year. Not all species are resilient to rapid climatic changes, which increase the pace or frequency of other negative phenomena, such as ongoing desertification or the cyclical winter dzud disasters. However, the vast majority of threats to biodiversity result from anthropogenic pressures, including a wide range of commercial and subsistence activities (in particular, mining and animal husbandry) and leisure activities (tourism and leisure hunting), in particular, illegal activities (illegal logging, artisanal mining, poaching and illegal trade in animal species).

### **11.6 Legal, policy and institutional framework**

#### *Legal framework*

Mongolia has a long tradition in developing the legal framework for biodiversity conservation, dating back to the times of Chinggis Khan. For example, in 1206, "Ikh Zasag Khuuli" (the Law of Great Assembly) was adopted, inter alia regulating hunting rights and practices, and protection of wildlife and sacred sites.

In 1972, the Government passed the Decree on the Rational Utilization of Natural Resources and the Protection of the Natural Environment, soon followed by the Procedure on Strictly Protected Areas, adopted in 1975. During the socialist era, all land, forest and waters were nationalized, which largely facilitated the establishment of Great Gobi A and B StrPAs (5.3 million ha) in 1975.

The 1994 Law on Special Protected Areas defines four categories of the state-designated protected areas and provides a legal basis for the designation of LPAs by the aimag or soum authorities, and for the designation of external buffer zones. It defines the internal functional zoning pattern for StrPAs and NPs, and protective regimes in each SPA category, and their internal zones.

The 1995 Law on Environmental Protection (substantially revised in 2012) guides overall natural resource use and conservation. According to this Law, the land, its underground resources, forests, water, animals, plants and other natural resources shall be protected by the State. The Law confirms the power of the local authorities to designate LPAs. Amendments made in 2012 incorporate principles of co-management of natural resources, including community-based natural resources management, assigning to herder communities rights to use natural resources sustainably and benefit from nature conservation measures. Pursuant to the Law, environmental research shall be funded by the state and local budgets, and carried out by appropriate certified organizations, on request of the central state administrative bodies and governors, while citizens, business entities and organizations are encouraged to conduct research at their own expense. However, implementation of these provisions represents a big challenge.

The revised 2002 Law on Land establishes a special category of land, called "Land for special needs", which is the property of the State and may not be subject to private ownership. Land of protected areas is one of the subcategories of "Land for special needs". This Law also establishes the legal requirement for the adoption of land use plans (territorial land organization plans). It also contains obligations for land possessors and users to undertake measures preventing the deterioration of land characteristics and quality, as well as to "preserve and protect lands with forests, rare and endangered animals and plants, historical and cultural memorials".

The 1995 Law on Natural Flora regulates the protection, proper use and restoration of wild plants (other than forest or cultivated plants). It classifies

plant species as "extremely rare", "rare" or "common" (based on their degree of rarity, conservation status and restorative capacity), and is followed by an appendix listing "extremely rare" plant species in danger of extinction, automatically granting them legal protection. It defines areas important for maintaining environmental and ecological balance, where the use of all flora species for commercial purposes is prohibited (such areas include green zones in cities, villages, and other settled areas; areas within 2 km of the source of a river or stream and the bank of a lake or pond, extremely rare animal habitats, oases, areas with degraded plant cover, areas important for protection from sand movement, and soil erosion protection strips). Although relevant provisions concerning invasive alien species have already been added to this Law, due to the current budgetary shortages, no research on such species has been undertaken to date, and thus no data are available.

The 2012 Law on Fees for Use of Natural Resources regulates, among other matters, the charges for use of forest resources, wild plants and animals (chapter 3).

The 1997 Law on Buffer Zones of Special Protected Areas provides a legal basis for the designation of SPA buffer zones. The establishment of such buffer zones is obligatory for StrPAs and NPs, voluntary in the case of NRs and NMs, and not regulated in the case of LPAs. The Law contains a well-elaborated list of criteria for the establishment of buffer zones, including ecological and socioeconomic criteria, which are absent in the 1994 Law on Special Protected Areas in respect of their designation. What is particularly important for fauna species conservation is that, according to the ecological criteria, the buffer zones should not only preserve the current habitats of "very rare" and "rare" animal species, but also their range and migration routes as well as their potential distribution ranges, "even if they are not currently present" there.

Furthermore, the 1997 Law on Buffer Zones of Special Protected Areas enhances participation of local stakeholders in the management of buffer zones, providing the legal basis for the establishment of a voluntary advisory "buffer zone council", to be involved (together with the local governors and PAA) in the development and implementation of a "buffer zone management plan". It defines the obligatory contents of such a management plan. It allows the establishment of "buffer zone funds" for buffer zone management, which can gather funds from different sources, including "a certain amount of revenue from projects, activities and services conducted within the Buffer Zone" (which includes tourist services and fees), and use such funds for various purposes,

including support for the livelihoods of local people. Last, but not least, the Law requires carrying out a detailed EIA for a number of commercial activities conducted in the buffer zone: commercial logging, hunting, establishment of hunters' camps, exploration and mining of minerals, establishment of water reservoirs, and construction of floodwalls or dams. The Law does not require the same procedure for activities planned in the buffer zone and does not list tourist infrastructure and residential housing development among potentially harmful commercial activities.

The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof establishes two special bodies for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Administrative Council (including representatives of the central government responsible for nature and environment, industry, trade, food and agriculture, the state administrative organizations responsible for customs and professional inspections, and environmental NGOs) is responsible for the implementation of the Convention, and has the mandate to issue export and import licenses. The Scientific Council is responsible for producing assessments and submitting recommendations to the Administrative Council.

The 2006 Law on Minerals regulates the process for licensing large-scale exploration and mining activities, and prohibits such activities within the "Land for special needs" (which includes state and local protected areas). However, its current provisions impair effective public consultations during the licensing process, by not including a requirement to consult on planned licences with potentially affected local communities, and by establishing a 30-day deadline for comments, after which exploration licences are automatically granted. Moreover, although the Ministry of Environment and Tourism is part of a special commission that approves the permit to start mining operations, at that stage, the opportunities to include the results of the EIA are limited (chapter 1). The lack of a clear picture on the exact boundaries of LPAs further impedes the opportunities available to the Ministry of Environment and Tourism to react where an exploration area overlaps a protected area.

The 2012 Law on Fauna regulates the protection, management (also reintroduction), possession, breeding and use of wild animals, including provisions on hunting and trapping, hunting seasons, issuance of permits and export of animals. It defines 11 types of activities aimed at the protection of fauna and assigns



responsibilities for their implementation to either the State or citizens and legal entities. It regulates the protection of fauna species classified either as "very rare" or "rare", provides the revised list of 32 "very rare" species, including 22 mammal, 8 bird and 2 fish species (substantially extended in the case of mammals, compared with the list in the 2000 Law on Fauna, where only 12 mammal species were listed), and regulates hunting of the "rare" species. Despite the fact that the Law includes provisions concerning invasive alien species, due to the current budgetary shortages, no research on such species has been undertaken to date, and no data are available.

There are numerous by-laws and officially adopted procedures related to protected area management resulting from and supporting enforcement of the Law on Special Protected Areas and the Law on Buffer Zones of Special Protected Areas. These include procedures on regulation of tourist activities in protected areas (1996/2002), on the protected area Buffer Zone Councils (1998), on taking land under local protection (2000), on the use of mineral waters and water bodies in protected areas (2000), on issuance of permits for land use in protected areas (2001), on service tariffs in protected areas (2002), on forestry activities in protected areas (2003) and on community-managed protected areas (2011). In 2013, the Methodology and Guideline on Development of Protected Area Management Plan and Guideline to Develop Protected Area Business Plan were adopted.

#### Revision of protected area legislation

The 1994 Law on Special Protected Areas has numerous shortcomings and inconsistencies. For instance, it does not define criteria for the designation of protected areas (by either the state or local authorities), does not require the development and implementation of management plans, and neither does it regulate or provide guidance on the expected format, structure, contents and procedure for drafting and approval of such important documents. Moreover, it does not require the integration of the provisions of management plans for the protected area or its buffer zone into the land use plans (territorial land organization plans) required by the revised 2002 Law on Land. It does not require clear marking on the ground of the boundaries of protected areas and of their internal functional zones, entailing different protective regimes, and the range of prohibited activities. It does not specify the management structure for PAAs, which establishment is obligatory in the case of StrPAs and NPs. It assigns the powers to decide on SPA management-related issues to the central government organization (Ministry of Environment and Tourism) and, at the same time, it

delegates responsibility for the management of NRs and monuments to the regional and local authorities (governors). The Law does not specify which authority has the power to declassify protected areas, if such declassification is allowed at all. Moreover, the Law does not establish a moratorium on the issuance of exploration or mining licences concerning areas officially considered for inclusion in the protected area network.

An inconsistency resulting from the Law on Buffer Zones of Special Protected Areas is that governors are legally obliged to develop and implement the "buffer zone management plans", which could imply that, in the case of NPs (where such buffer zones may overlap with the NP "limited use zone"), such locally developed plans (although with the participation of the PAA) would constitute the management plan for some part of the NP and be implemented by the local authorities, at their expense.

Due to a considerable number of gaps and shortcomings, and several contradictions, the Law on Special Protected Areas is currently under revision, together with the Law on Buffer Zones of Special Protected Areas. The revision process has continued for more than a decade, as the first amendments proposed in 2006 were reviewed by IUCN in 2007 and, upon consideration of that review, the Ministry decided to prepare a new revised version, in order to eliminate shortcomings and merge the two above laws.

#### Assessment

The legislation concerning biodiversity protection is generally quite complex, and it meets international standards. The 1995 Law on Natural Flora and the 2012 Law on Fauna are favourable for species conservation, but continue the tradition of classifying wild flora and fauna species as "extremely/very rare", "rare" or "common", which do not correspond to the IUCN Red List categories and criteria. The Law on Minerals contains provisions preventing proper consultation with local communities and coordination with the Ministry of Environment and Tourism. The 1994 Law on Special Protected Areas has numerous shortcomings and does not adequately regulate the legal framework for the designation, management planning and management of protected areas, whether state or locally designated. The relationships between, and responsibilities of, central, regional and local authorities responsible for biodiversity conservation and protected area designation and management are not clear. Moreover, management planning for the protected area network (which already encompasses a considerable share of the country's territory, and is

still expanding) is not integrated with the spatial land-use planning regulated by the revised 2002 Law on Land.

### *Policy framework*

#### 1996 National Biodiversity Action Plan

The 1996 National Biodiversity Action Plan for Mongolia defined 17 objectives, which were translated into a number of actions. Of the 17 objectives, three were directly related to biodiversity conservation: to establish a complete protected area system representative of all ecosystems and protecting endangered species, including joint actions with the People's Republic of China and the Russian Federation; to control hunting and fishing; and to improve ex situ management for species conservation and conserving genetic resources. One objective concerned the establishment of a research programme to improve knowledge on biodiversity and threats, while another assumed the establishment of a nationwide information and monitoring system (on biodiversity). The assessment carried out in 2010 concluded that "96 per cent of the goals had been implemented, indicating that full implementation had been achieved". However, several objectives of this Plan reappear in the 2015 National Biodiversity Programme 2015–2025.

#### 1998 National Programme on Special Protected Areas

The 1998 National Programme on Special Protected Areas (corresponding to the CBD Programme of Work on Protected Areas) assumed the establishment of the ecologically representative network of protected areas, to cover 30 per cent of Mongolia by 2015, and raising the effectiveness of protected area management. It also assumed "extending the protection of the special protected areas and their buffer zones into local planning and protection activities". Furthermore, it included provisions on collecting research findings, data and information on protected areas in a unified database, establishing a monitoring network on the state of protected areas, and the requirement for the development of protected area management plans and involvement of local communities in their implementation. In 1999, the Government adopted the Action Plan for the Implementation of the National Programme on Special Protected Areas for 1998–2005. As of 2017, a new programme on SPAs is to be developed (chapter 1).

#### 2015 National Biodiversity Programme for the period 2015–2025

The 2015 National Biodiversity Programme for the period 2015–2025, largely based on and inspired by the CBD Strategic Plan for Biodiversity 2011–2020 and its Aichi Biodiversity Targets (adopted in 2010 at the CBD COP 10), determines 14 goals under four strategies (translated into 29 objectives and 74 outputs):

- Strategy 1: Increase awareness and knowledge on biodiversity conservation and sustainable use among both decision makers and the general public;
- Strategy 2: Develop and implement science-based policy on conservation and sustainable use of biological resources;
- Strategy 3: Sustainable use of biodiversity;
- Strategy 4: Improve policies and legal environment for conservation and use of biological diversity and ecological services.

Again, 3 of the 14 goals are directly related to biodiversity conservation. Goal 4 relates to the full implementation of national programmes on conservation of rare and endangered animal and plant species, and undertaking research on invasive alien species. The Programme does not reiterate commitments to extend the protected area network to reach 30 per cent of the country. Instead, Goal 5 assumes including "at least 30 per cent of each representative of the main ecosystems, all patch and vulnerable to climate change ecosystems" into the national protected area network, and improving their management. Goal 7 aims at increasing forest cover to 9 per cent by 2025 through the improvement of forest management, "thereby protecting forest biodiversity".

Furthermore, Goal 9 aims at reducing and preventing pasture overgrazing and degradation (seriously affecting wildlife habitats), and Goal 10 relates to undertaking detailed EIA, in order to release the land important for biological diversity from mining and agriculture use and take it under protection. Goal 8 assumes handing over the responsibility for hunting reserve management to local community partnerships and private enterprises, and creating the legal environment for the imposition of customs tax on game species and natural plant exports. Goal 2 calls for establishment of the "biodiversity subdatabase" through improving the content of and access to the National Environmental Information Database (which resembles Objective 3.2.5 of the previous 1996 National Biodiversity Action Plan).

The mid-term evaluation of the implementation of the Programme is planned for 2020. However, there are serious concerns that the currently available level of funding would not be sufficient for the full implementation of the Programme. It is estimated that the implementation cost (solely between 2017 and 2021) would account for some US\$123.9 million (of which more than 64 per cent is necessary for achieving the three main objectives, including the increase of forest cover, expansion of the protected area network and prevention of soil and water resources pollution), while the state budget can provide only some US\$40.4 million, and seven organizations can contribute a further US\$38.4 million for 26 planned projects. Thus, the gap in funding necessary for the implementation of the Programme would be US\$45.2 million, only between 2017 and 2021.

#### Other

Several national programmes and action plans on protection of rare and endangered animal and plant species were adopted in Mongolia, e.g. concerning the conservation of the argali sheep, red deer, Saker falcon, snow leopard, saiga antelope, taimen and Gobi bear.

#### Assessment

The policy framework for biodiversity conservation is very complex and contains a considerable number of strategic documents, reflecting the commitment of Mongolia to effectively implement the provisions of the CBD, as well as its globally adopted programmes of work and strategic plans. However, actual implementation is undermined by the general absence of sufficient funding; thus, it is not fully feasible, especially when confronting the extensive range of ambitious tasks listed in strategic documents (some of which resemble well-justified wish lists) with the current capacities. Several important objectives of the 1996 National Biodiversity Action Plan have not been fully achieved as at 2017.

Therefore, in the light of the rapid decline of wildlife species populations and the level of threats to ecosystems, the effective implementation of two goals of the current National Biodiversity Programme 2015–2025 is of particular importance for Mongolia: Goal 4 assuming the full implementation of national programmes on conservation of rare and endangered animal and plant species, and Goal 5 assuming the inclusion of all main ecosystems into the national protected area network.

#### *Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis selected targets under Goal 15 is described in box 11.1.

#### *Institutional framework*

##### Ministry of Environment and Tourism

The Ministry of Environment and Tourism is the main central administrative body responsible for the environment, nature conservation and green development. Its tasks include management of protected areas, water and forest resources and hunting, as well as biodiversity conservation and monitoring. Its Environment and Natural Resources Management Department and Protected Areas Management Department have specific tasks related to biodiversity and protected areas management.

The Protected Areas Management Department is directly responsible for the management of the entire protected area system. As of 2017, it has seven staff members, including the director, two senior officers (on protected area management and on land use) and four officers – one is in charge of zoning, buffer zones and LPA management, one is in charge of tourism, training, advocacy, monitoring and evaluation, one is in charge of research and data management, and one is in charge of international cooperation and legal issues.

The Department provides policy, legal and technical guidance on protected area planning and management, and supervises the activities of 33 regional protected area administrations (PAAs), each of them directly responsible for managing one or more state-protected areas (StrPAs and NPs) within their respective operational ranges. All regional PAAs have a common organizational structure, consisting of a PAA director, administration, specialists, rangers and non-technical support staff. The number of PAA personnel largely depends on the size of the total territory and specific landscape characteristics of the managed protected areas. In 2017, there were 607 staff (including 337 field rangers) in 33 PAAs (including three administrations managed by NGOs), compared with 625 staff in 2013–2014. Field rangers are responsible for patrolling, surveillance, law enforcement and recording nature observations. Pursuant to 2006 Government Resolution No. 87, their operational ranges vary depending on the area topography, e.g. a patrolling district assigned to one ranger would be 40,000 ha in mountainous areas, 50,000 ha in high mountains and 200,000 ha in the Gobi Desert area.



**Box 11.1: Selected targets under Goal 15  
of the 2030 Agenda for Sustainable Development**

**Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

Overall, Targets 15.1 and 15.5 and related indicators are adequately addressed by the current National Biodiversity Programme for the period 2015–2025 (respectively under that Programme's Goal 5 concerning the sufficient coverage of ecosystems by the protected area network, and Goal 4 concerning the implementation of programmes on conservation of rare and endangered animal and plant species). However, the achievement of SDG Goal 15 and corresponding goals of the National Biodiversity Programme for the period 2015–2025 may not be feasible, due to insufficient capacities for implementation (in particular, the lack of financial and human resources). Without external financial and expert assistance, Mongolia would not be able to implement the Programme and achieve the targets of SDG Goal 15.

**Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements**

The proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, calculated separately for each of 19 natural ecosystem types (Indicator 15.1.2) has already been assessed in Mongolia. In 2010, these proportions were (by percentage, listed in indicator value descending order) as follows: glacier 79.39, lake 79.02, extreme arid desert 74.18, alpine tundra 40.73, alpine meadow 34.80, boreal coniferous forest 31.42, true desert 27.25, intermittent rivers and ephemeral channels 26.67, sub-alpine woodland 15.62, perennial rivers and floodplains 13.94, semi-desert 13.91, sand dunes 13.08, high mountain steppe 11.14, sub-boreal mixed forest 9.96, closed depressions and salt banks 9.03, meadow steppe 7.62, desert steppe 6.59, moderate dry steppe 5.39 and dry steppe 4.24. Thus, the last four steppe ecosystems, which together cover 55.42 per cent of the country and are thus the most representative of Mongolia, had the smallest protected area coverage in 2010. Since then, the above values must have changed, due to the extension of the protected area network. But, according to the 2015 National Biodiversity Programme for the period 2015–2020, not all representative ecosystems have been sufficiently included in the protected area network, which remains the task to be accomplished under its Goal 5.

**Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development**

Mongolia is a highly elevated country (averaging 1,580 m above sea level); mountain ranges cover a large part of its territory. No assessments indicating areas most important for mountain diversity in Mongolia are available; thus, Indicator 15.4.1 (Coverage by protected areas of important sites for mountain biodiversity) cannot be calculated. In 2010, the prevailing parts of mountain ecosystems, such as sub-alpine woodland, high mountain steppe and sub-boreal mixed forest, remained outside protected areas, which should be taken into consideration when planning the extension of the protected area network. Moreover, mountain ranges such as the Mongol Altai and Gobi Altai, extending across the south of the country and encompassing steppe and desert ecosystems, are also important habitats of threatened mountain species, other than the boreal zone.

The value of the Mountain Green Cover Index (Indicator 15.4.2) would naturally be very different for the Mongol Altai and Gobi Altai than for the more afforested westernmost part of the Altai range, the Khangai Mountains and Khentii Mountains. Goal 7 of the 2015 National Biodiversity Programme for the period 2015–2020 aims at increasing forest cover to 9 per cent by 2025, which would then influence the value of the Mountain Green Cover Index for the country.

**Target 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species**

The IUCN Red List Index (Indicator 15.5.1), which aggregates change in extinction risk across groups of species, cannot be calculated for Mongolia as the assessments following the IUCN methodology have been carried out only in 2006 for mammals, fishes, reptiles and amphibians and only in 2011 for birds and for "very rare" plant species, while, in order to calculate the Red List Index, all species in a group must have been assessed for the IUCN Red List at least twice. Hence, the Red List Index calculation requires the elaboration of the next edition of national Red Lists, with the use of IUCN criteria.

The current status of most species is not known, partly due to discontinuation of research and nationwide wildlife censuses, which were periodically conducted in different biomes until 2010. However, it is obvious which species urgently require special attention.

According to IUCN global assessments, as many as 41 animal species native to Mongolia (11 mammal, 25 bird, 2 fish and 3 invertebrate species) were considered by the IUCN in 2017 as globally threatened. Furthermore, according to the last Red List edition, 110 vascular plant, 11 fish, 2 reptile, 4 amphibian, 20 bird and 21 mammal species were regionally threatened in

Mongolia. Thus, scientific field research and biodiversity monitoring should first and foremost focus on the above species, to allow updating of the Red Lists and development of national species conservation programmes.

**Target 15.7: Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products**

As data on the current size of wildlife populations are not available, Indicator 15.7.1 (Proportion of traded wildlife that was poached or illicitly trafficked) cannot be calculated. Nevertheless, the Mongolian Government can further decrease the supply of illegal wildlife products and suppress poaching by enhancing law enforcement, in particular by raising the operational capacities of ranger services, particularly by providing them with modern communication and navigation equipment, and off-road vehicles. Furthermore, enhanced customs controls at the state border crossings can further reduce the trade in illegal wildlife products.

**Target 15.8: By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species**

With regard to Indicator 15.8.1 (Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species), Mongolia has already adopted relevant legislation. The provisions concerning invasive alien species are present in the 1995 Law on Natural Flora and 2012 Law on Fauna. However, implementation is hampered by the lack of data on the import channels and distribution of such species, as, due to the current budgetary shortages, no research on invasive alien species has been undertaken to date. Hence, Indicator 15.8.1 has not yet been achieved.

**Target 15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts**

Indicator 15.9.1 refers to progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020. There is no effective mechanism for the integration of protected area management plans with the local land use plans (territorial land organization plans), in particular since the mechanism of SEA is not used in practice (chapter 1).

**Target 15.a: Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems**

Indicator 15.a.1 is official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems. Unfortunately, public funding available for the conservation and sustainable use of biodiversity and ecosystems in Mongolia has recently diminished, which may impede the implementation of the 2015 National Biodiversity Programme for the period 2015–2020. Therefore, mobilizing external financial assistance is indispensable.

**Target 15.c: Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities**

Progress under Target 15.c, measured by Indicator 15.c.1 (Proportion of traded wildlife that was poached or illicitly trafficked), would require similar measures as under Target 15.7. However, Mongolia has achieved much in terms of increasing the capacity of local communities to pursue sustainable livelihood opportunities, through the application of the community-based protected area management and forest management approaches, which substantially reduce illegal practices such as poaching and illegal logging.

The operational capacities of both the Protected Areas Management Department and 33 PAAs are quite limited, in terms of both human resources and technical capacity. It is estimated that, in the current conditions, the effective management of 52 protected areas entrusted to PAAs would require an additional 80 rangers. However, younger and physically fit rangers tend to quit jobs in the nature conservation sector.

Budgetary constraints are common in State-funded PAAs, which cannot retain and use revenues from entrance fees, even though they manage areas commonly perceived to be major tourist attractions. When an NP's base budget is allocated, an estimated entrance fee amount is deducted. If the park collects

more than an estimated amount, the difference will be deposited in the general treasury. There is no legal requirement for land fees to be allocated for the maintenance and management of protected areas.

Moreover, the budget of the Ministry of Environment and Tourism declined in recent years; the 2017 budget accounted for 52 per cent of the 2011 value in tugriks (only 30.4 per cent if expressed in US dollars). Expenditures on protected area network management account for only some 3 per cent of the budget, and the vast majority (some 80–90 per cent) is spent on staff salaries and basic operational costs, while not much remains for active biodiversity conservation measures in the field. The level of funding by the Environment and Climate Change Fund (chapter 3) for the

implementation of different national biodiversity conservation programmes decreased recently, e.g. the amount allocated for SPAs in 2016 was equivalent to 69.4 per cent of the funding available in 2014, for the protection of natural plants, equivalent to 14.4 per cent, and for the protection of rare and endangered species, equivalent to 58.7 per cent of the 2014 value (table 3.14).

NAMEM's Information and Research Institute of Meteorology, Hydrology and Environment hosts the EIC, which runs databases on biodiversity and protected areas.

#### Other ministries

The Ministry of Construction and Urban Development, through its Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) oversees land use planning.

The Ministry of Food, Agriculture and Light Industry regulates agricultural development, pasture and livestock management.

The Ministry of Mining and Heavy Industry retains authority over mineral resources extraction and licensing.

#### Local level

Governors at the aimag and soum levels are responsible for the management of state NRs and monuments, LPAs and buffer zones of protected areas. Other important stakeholders are the local communities and community-based organizations, as well as more than 500 national and local environmental NGOs.

Despite the fact that NRs and NMs are part of the state SPA network, the state budget does not finance their management. Aimag and soum budgets can neither afford the establishment and maintenance of management structures with comparable capacities to those of the State-funded PAAs, nor employ qualified specialists and an adequate number of field staff, much less implement active protective measures. Hence, LPAs and buffer zones are often subject to contracts, delegating management rights to community-based organizations, herders' associations and environmental NGOs (the latter often dependent on external funding support). As a result, LPAs are often criticized for their limited conservation impact and called "paper parks" (existing on the map, but not well established and functioning on the ground). Consequently, with few exceptions, they receive much

less attention and support than StrPAs and NPs, in particular those that also hold international designations (Ramsar sites, IBAs, UNESCO BRs and World Heritage sites), despite the fact that they often cover ecosystems and habitats critically underrepresented in the current State-managed network.

#### Assessment

The current institutional set-up, the distribution of responsibilities across central government, aimag and soum authorities, and human, technical, operational and financial capacities are not sufficient for the tasks determined by the current policy framework. Thus, the risk of failure in achieving the biodiversity conservation objectives is obvious. A perfect justification for the above statement is the example of having just seven officers of the Ministry of Environment and Tourism's Protected Areas Management Department responsible for effective management of the state SPA system, or 337 rangers responsible for surveillance and law enforcement over 24 million ha of territory. The recent budget reductions seriously affect the capacities of the Ministry of Environment and Tourism, including its field services responsible for protected area management and the implementation of biodiversity conservation measures, national programmes and action plans.

#### *Regulatory, economic and information measures*

The 1994 Law on Special Protected Areas regulates the use of land in limited use zones of StrPAs and NPs, and in NRs and NMs, by Mongolian citizens, business entities and organizations, and provides the legal basis for land use contracts, the duration of which cannot exceed five years. It also regulates research activities in SPAs. The payment of fees is required for both the land use and carrying out research activities. This Law imposes the obligation to compensate for damage, and determines fines for the violation of SPA regulations (which includes damage caused by research activities), where the amount of the fine depends on the type of violation, category of protected area, extent of the damage and whether the violator is a physical person, an organization or an economic entity.

The 1995 Law on Environmental Protection provides the legal basis for charging fees and payments for the use of natural resources, and the obligation to compensate for exceeding the permitted limits for their use or discharge of waste and pollutants. This Law established the Environmental Protection Fund (subsequently the Environment and Climate Change

Fund, (chapter 3)), which collects fees and payments for environmental pollution and adverse environmental impacts, licence fees for travel and tourism in state SPAs, donations and revenue from other sources. These funds are to be allocated for ecological education, environmental protection and natural resource restoration. This Law also determines fines for the breach of environmental protection legislation.

The 1995 Law on Natural Flora regulates the use of plants and also determines the level of penalties for any violation of this Law, while fees for the use of flora are regulated by the 2012 Law on Fees for Use of Natural Resources. The 2012 Law on Fauna provides the legal basis for charging fees for the use of animal species and determines the level of penalties for violations. The 2002 Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof determines fines for the breach of this Law, and establishes an economic incentive for citizens who have identified or reported parties infringing the legislation, by providing financial rewards of a value up to 20 per cent of the paid fine.

In 2017, biodiversity-related information available online via the Mongolian Statistical Information Service and in the Mongolian Statistical Yearbook 2015 is limited to data on forest land and harvest volume, the number of rare animals allowed to be hunted and caught for "special purpose hunting" and sport fishing, and the maximum limit on hunting wild animals for domestic purposes.

Pursuant to the legislation in force, environmental information shall be stored in soum, aimag and capital city databanks, and the central state databank, including reports, information and data on, for example, forests, animals and plants, in particular those acquired in the course of public-funded research (which are to be provided free of charge). The Ministry of Environment and Tourism is in charge of the harmonization of different databases.

The EIC database facilitates public access to 39 thematic databases, including databases on forests, flora, fauna, state SPAs and LPAs. Access to the wild animal and vegetation-monitoring databases, hosted by WWF, requires prior user registration.

#### Red Lists of flora and fauna species

Three editions of the Red Data Book of Mongolia were published, the first in 1987 and the second in 1997, listing endangered and threatened plant and

animal species present in the country. Of 100 plant species included in these books, most were endemic to Mongolia.

Assessments for the third edition have been conducted on the basis of the 2001 IUCN Red List Categories and Criteria Version 3.1, for the first time enabling comparisons of the conservation status of Mongolian species with other regions. In cooperation with the Zoological Society of London, several Red List volumes were published: the Red List of Mammals, of Fishes, and of Reptiles and Amphibians in 2006, and of Birds in 2011, each accompanied by a separate Summary Conservation Action Plan published in the same year as the corresponding volume of the Red List.

In 2011, the first part of the third edition of the Red List of Plants was published, with a focus on 148 plant species, including 131 plant species categorized as "very rare" and included in the appendix of the 1995 Law on Natural Flora, and 82 species listed in the 1997 edition of the Red Book (75 species were present in both documents), on request of the then Ministry of Nature, Environment and Tourism, in order to support the development of management policies for the conservation of these species. The second part of the third edition of the Mongolian Red List of Plants, expected to assess the status of "rare" and other important plant species, is not elaborated nor published, due to the lack of financial resources.

#### Assessment

The biodiversity information management system requires further improvement, in particular in terms of enhanced communication and data exchange among different ministries, institutions and agencies, and in particular between different administrative levels. The obvious success is that Mongolia elaborated the Red Lists of all native vertebrate species, following the IUCN methodology. However, the works on the second part of the Mongolian Red List of Plants are still pending, due to the lack of scientific field research and funding support.

### **11.7 Participation in international agreements and processes**

#### *International agreements*

Under the Convention Concerning the Protection of the World Cultural and Natural Heritage to which Mongolia has been party since 1990, five sites have so far been inscribed by UNESCO on the World Heritage List, including three cultural and two natural sites.

Mongolia is involved in the UNESCO Man and the Biosphere Programme (MaB), aiming at the reconciliation of biodiversity conservation and the sustainable use of natural resources. Mongolia is an active member of the East Asian Biosphere Reserve Network and contributes to the MaB Programme with its network (covering 16,078,072 ha, 10.28 per cent of the country's territory) including six BRs (table 11.4).

Since 1993, Mongolia has been party to the Convention on Biological Diversity (CBD) (chapter 7). Several strategic action plans and programmes directed towards CBD implementation at the national level were developed. Between 1998 and 2014, Mongolia submitted five national reports on the implementation of the CBD. Mongolia has also been a party to the Cartagena Protocol on Biosafety since 2000, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization since 2014.

Since 1996, Mongolia has been a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (chapter 6). However, in the first years, implementation of the Convention (other than regular submission of annual national reports) was limited, e.g. controls at the state borders were performed only occasionally. Most recently, WWF Mongolia prepared "Guidelines for identification of wildlife species", while the Wildlife Conservation Society is planning to launch in 2017 a new project on implementation of the Convention, targeted at customs officers.

In 1998, Mongolia became a party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and, between 1997 and 2004, designated 11 Ramsar sites, covering 1,439,530 ha in total (table 11.5). To date, only part of these Ramsar sites is included in the national system of protected areas.

Since 1999, Mongolia has been a party to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), a member of the Convention's Central Asian Mammals Initiative and a signatory to three instruments: since 2004, to the MoU concerning Conservation Measures for the Siberian crane; since 2008, to the MoU on the Conservation of Migratory Birds of Prey in Africa and Eurasia; and, since 2010, to the MoU concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope (chapter 6).

### *Bilateral agreements*

In 2000, the Ministry of Nature and Environment of Mongolia and the State Administration of Environmental Protection of the People's Republic of China signed an MoU on conservation of transboundary-migrating Bactrian camels.

In 2014, an intergovernmental agreement on transboundary cooperation between Onon Balj NP and Sokhondinsky Reserve in the Russian Federation was signed.

Several Mongolian protected areas are involved in bilateral international cooperation with protected areas in other countries, e.g. in the United States of America (Gorkhi-Terelj NP with Glacier NP; Khuvsgul NP with Yosemite NP; Ikh Nart NR with Anza-Borrego Desert State Park), and in the Republic of Korea (Khan Khentii StrPA with Seoraksan NP). In 2017, a partnership agreement was concluded between Otgontenger StrPA and Denali NP in the United States.

Mongolian protected areas are involved in field staff exchange training programmes with Japan and the People's Republic of China.

### *Transboundary ecological network*

Mongolia cooperates with neighbouring countries on the establishment of transboundary protected areas.

In 1994, the trilateral (Mongolia, the People's Republic of China and the Russian Federation) transboundary protected area "Dauria International Protected Area" (DIPA) was established, including Mongol Daguur StrPA (in Dornod Aimag, Mongolia), Daursky State Nature Reserve, Tsasucheisky Bor and Valley of Dzeren (two National Wildlife Refuges in Chita Province, the Russian Federation), and Lake Hulun (Dalai Nuur) Nature National Biosphere Reserve (in the Inner Mongolia Autonomous Region of the People's Republic of China).

In 2011, a bilateral (Mongolia and the Russian Federation) transboundary protected area was established in the Lake Uvs Basin, including Uvs Nuur StrPA (in Uvs Aimag, Mongolia) and Ubsunurskaya Kotlovina State Nature Biosphere Reserve (in Tuva, the Russian Federation).

The Ministry of Environment and Tourism plans to establish three further transboundary protected areas between 2017 and 2019 (e.g. including Khuvsgul NP in Mongolia and Tunkinsky National Park in the Russian Federation).



### *International projects*

In the period 1993–1997, the Governments of Australia and the Netherlands and the Foundation for the Preservation and Protection of the Przewalski Horse (the Netherlands) supported two projects on the reintroduction and acclimatization of this rare and almost extinct species in Hustai Nuruu NP (box 11.2).

In the period 1994–1998, the German Government supported the preservation and sustainable use of biodiversity in the East Mongolian steppes, and research and data gathering for the development of management plans of three StrPAs. In the period 1995–1998, the German Government focused on capacity-building for StrPAs, as well as environmental protection and sustainable development of areas adjacent to StrPAs, which paved the way for the GIZ-funded project Environmental Preservation and Buffer Zone Development Phase II (US\$21 million). In the period 2009–2011, GTZ supported the Climate Change and Biodiversity Programme (US\$8.5 million) on the conservation of biodiversity in forest and steppe areas, which is endangered by climate change in the Khangai and Khentii Aimags.

In the period 1998–2001, USAID, the United States Department of the Interior and Partnership for Biodiversity provided technical assistance under the

Strengthening the Lake Khuvsgul National Park Programme.

In the period 1993–1997, WWF Mongolia carried out the Preservation of Biodiversity of Mongolia project, the outcomes of which included the management plan for Lake Khuvsgul NP. In the period 1993–1999, in cooperation with the Ministry of Environment, WWF elaborated proposals for the designation of five NPs (Gorhi-Terelj, Gobi-Gurban Saihan, Khorgo-Terhiin Tsagaan Nuur, Khangai Range and Khar Us Nuur NP), which were approved by the Government and the State Great Khural. From 1997 to 2002, WWF provided assistance for the development and implementation of a management plan for Lake Khar-Us NP, and, from 1998 to 2002, it supported the protection of saiga antelopes in Sharga-Manhan NP, as well as the development and implementation of a management plan. In the period 1998–2003, WWF and UNDP joined forces to develop management plans for the Eastern Mongolian and Mongolia-Daurian StrPAs.

In the period 2004–2011, UNDP carried out the projects Community-based Conservation of Biological Diversity in the Mountain Landscapes of Mongolia's Altai Sayan Ecoregion (financed by GEF and the Netherlands, US\$4.8 million), and Preservation of Great Gobi Strictly Protected Area Ecosystem on the Example of the Wild Bactrian Camel (financed by GEF, US\$1.5 million).

#### **Box 11.2: Hustai Nuruu National Park, an emblematic example of international cooperation**

Hustai Nuruu was originally designated as a nature reserve in 1993, to protect takhi – Przewalski's horse (*Equus ferus ssp. przewalskii*), at that time listed by IUCN as Extinct in the Wild (EW). In the period 1992–2000, 84 horses were brought from Europe by the Foundation for the Preservation and Protection of the Przewalski Horse and the Mongolian Association for Conservation of Nature and the Environment (MACNE). Two projects on the reintroduction and acclimatization of this rare species were supported by the Governments of Australia and the Netherlands (the latter has also supported the conservation of the park ecosystems, capacity-building of the park management and development of sustainable livelihoods in the buffer zone of the park). Research programmes in Hustai Nuruu often involve foreign partners, including Japan's Kyoto University and Tokyo University, and Wageningen University of the Netherlands.

In 1998, in recognition of the successful reintroduction of takhi, and the implementation of other biodiversity conservation measures and scientific research programmes, Hustai Nuruu was designated a National Park (with an area of 50,600 ha and buffer zone of 350,000 ha) and, in 2002, was nominated a UNESCO Biosphere Reserve (with an additional external transition area of 378,000 ha). Hustai Nuruu was the first SPA in Mongolia to be managed on a contract basis by an NGO (by MACNE from 1993 to 2003, and by the local Hustai Nuruu NP Trust (HNPT) since 2003), and among the first to have a valid management plan (since 2002).

HNPT is the only NGO in Mongolia to have a scientific council (composed of biologists, botanists, ecologists and veterinarians, representing Mongolian universities and research institutes), which provides advice and oversees the Trust's management, research and training activities. HNPT has some 60 employees, including the protection unit (13 rangers) which patrols the park area and monitors wildlife populations daily, and a research and training unit (including biologists, a data manager and an eco-volunteer coordinator). In order to finance nature conservation programmes, HNPT has developed a wide range of ecotourism initiatives, some community based, that present the traditional nomadic lifestyle, encouraging tourists to visit local families inhabiting the park buffer zone. HNPT involves local people in conservation and research activities and provides them with viable income opportunities other than the traditional animal husbandry. HNPT initiatives include the establishment of the cheese factory in Altanbulag soum and the yoghurt factory in Bayankhangai soum; part of their dairy products are bought by the HNPT and offered to park visitors, together with other local products made by cooperating herder communities. As a result, the park is self-financing and its management does not require state budget subsidies.

**Photo 11.2: Przewalski's horses in Hustai Nuruu National Park**

The Nature Conservancy has been working since 2006 on the conservation of the Eastern Steppe, development of conservation plans with key stakeholders and on community-based management in Hustai Nuruu NP and Ikh Nart NR.

The Wildlife Conservation Society project Daurian Steppe SCAPES, Sustainable Conservation Approaches in Priority Ecosystems (2009–2014, financed by USAID, US\$1.2 million) supported community-based grasslands conservation, wildlife management planning, monitoring and enforcement, including support for Khavtagar LPA.

In 2010, a comprehensive report on the current gaps in the SPA system was published under the umbrella of the Protected Areas for a Living Planet project (financed by MAVA Foundation), Long-term Conservation of Argali and Snow Leopard in Transboundary Areas of the Altay-Sayan Ecoregion between Mongolia and the Russian Federation (financed by WWF Netherlands) and Supporting Country Action on the CBD Programme of Work on Protected Areas (financed by GEF/UNOPS), which summarized and consolidated outputs of several

research projects carried out from 2007 to 2009 by the Nature Conservancy (in the Mongolian Daurian ecoregion), GEF (in Hangay and Gobi ecoregions) and WWF Mongolia (in Altay-Sayan ecoregion).

Under the GEF-funded project Strengthening the Protected Area Network in Mongolia (SPAN), implemented by UNDP in the period 2010–2015 (US\$4.3 million), the revised Methodology and Guideline on Development of Protected Area Management Plan and Guideline to Develop Protected Area Business Plan were elaborated, tested in two pilot sites (Orkhon Valley NP and Ikh Nart NR) and officially approved by the Ministry of Environment and Tourism in 2013. Some 289 protected area managers were trained to use both these methodologies, which currently serve for updating existing management plans.

Mongolia's Network of Managed Resources Protected Areas (MRPA) project, implemented by UNDP in the period 2013–2018 (US\$6.2 million) focuses on LPAs, with the objective to supplement the state system with a network of community conservation areas covering underrepresented terrestrial ecosystems. The pilot

sites of the MRPA project are Gulzat LPA, Khavtgar LPA and the buffer zone of Toson Khulstai NR.

The ADB has launched the Country Partnership Strategy for Mongolia 2017–2020, within which one project (Integrated Livelihoods Improvement and Sustainable Tourism in Lake Khuvsgul National Park, 2016–2019, grant of US\$3.0 million) is currently ongoing, while another (Sustainable Tourism Development, 2019–2022, US\$38.0 million loan) is in preparation. Lake Khuvsgul is the largest freshwater lake in Mongolia and contains 70 per cent of Mongolia's fresh water. The lake is also of transboundary importance as it drains via Selenge River into Lake Baikal in the Russian Federation. In the past, the national park received few visitors, but once the road access improved, visitor numbers increased from 11,000 in 2010 to 60,000 in 2014, and more than 60 tourist camps were established, which immediately threatened the natural values, due to the lack of or insufficient infrastructure for waste treatment and tourism. The project has the ambition to implement an integrated approach for livelihoods, tourism, waste management and land use planning, and serve as a model for other protected areas in Mongolia.

In 2015, KfW Development Bank launched its first large biodiversity-related project, Biodiversity and Adaptation to Climate Change, with a €15.3 million budget, focused on capacity-building for PAAs, increasing their management effectiveness and cooperation with the local communities in buffer zones. In the first phase (apart from providing the selected 11 PAAs with equipment, infrastructure, vehicles and uniforms), the project supported, by a participatory process and with the involvement of the academic sector, the development of protected area and buffer zone management plans and resulting annual action plans. In its next phases, from 2018, the project will include support for the implementation of management plans of other, not previously involved, PAAs (having a management plan was the prerequisite for applying for the grants worth from 200 million tugriks to 1.5 billion tugriks), as well as establishment of data management system of and for PAAs.

#### *Assessment*

Mongolia cooperates on biodiversity conservation with other countries, both under the global MEAs and by developing regional, bilateral and multilateral cooperation, which includes the establishment of transboundary protected areas. The dialogue with neighbouring countries provides excellent opportunities for protecting shared natural ecosystems and habitats of endangered migratory wildlife species

and further extension of the transboundary protected area network.

The country contributes to the implementation of globally adopted work programmes and is active in various international cooperation networks. For this reason, Mongolia should be perceived as a sincere, reliable and very committed partner (sometimes committed well beyond its actual, far too limited capacities). Fortunately, acting in the common global interest, numerous supporters assist Mongolia in its efforts towards nature conservation, and these funds are wisely invested. Taking into account the beauty and wealth of globally important Mongolian landscapes, ecosystems and plant and animal species, it seems to be a good investment, yielding high profits for the present and future generations.

### **11.8 Assessment, conclusions and recommendations**

#### *Assessment*

Mongolia has managed to preserve its pristine natural ecosystems and is still one of the last wildlife species refuges of East Asia. This was possible not only due to the considerable size of the sparsely populated territory but also to the Mongolian culture and ethics, evolved throughout the centuries, of living in harmony with nature and using the scarce natural resources in a sustainable manner.

However, throughout the last three decades, Mongolia has experienced rapid declines of numerous species, including those globally threatened by extinction, as well as those abundant in other regions but recently becoming rare or almost extinct. Simultaneously, the integrity of almost all natural ecosystems in each of the four ecoregions of Mongolia is currently threatened, partly due to ongoing climatic changes, but mostly due to growing anthropogenic pressures.

The above means that the current legislation, institutional framework and protected area network do not provide for effective biodiversity conservation, and that undertaking additional efforts is urgently required.

The globally agreed SDGs indicate a number of targets that can serve as guidance in these endeavours (in particular, Targets 15.1, 15.4 and 15.5, but also 11.4). Moreover, as a party to the CBD, Mongolia committed to implement the CBD Strategic Plan for Biodiversity 2011–2020 and reach corresponding Aichi Targets, which are well incorporated into the country's current National Biodiversity Programme for the period 2015–2025.

*Conclusions and recommendations*Biodiversity monitoring and data availability

Information on biodiversity is neither regularly collected nor verified and updated, due to the absence of complex biodiversity monitoring and information systems. Lack of funding resulted in discontinuation (if not abandonment) of nationwide biodiversity research programmes. The few available data are dispersed among different authorities, agencies, research institutes and environmental organizations. Communication and data exchange among different data owners and different administrative levels is lacking.

Lack of access to reliable and updated information on biodiversity may lead to the duplication of research efforts, and impedes the development of national, regional or local policies, species conservation action plans, protected area management plans and the setting of hunting quotas. Ultimately, the lack of access to reliable and updated information on biodiversity is an impediment for progress in achieving SDG Target 15.5 (Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species).

Recommendation 11.1:

*The Ministry of Environment and Tourism should:*

- (a) *Support, in cooperation with the Ministry of Education, Culture, Science and Sports, nationwide biodiversity monitoring and research programmes, in particular those targeted at threatened ecosystems and endangered species of fauna and flora;*
- (b) *Update the Red Lists and elaborate the second part of the Red List of Plants;*
- (c) *Establish, in cooperation with the National Statistics Office, Mongolian Academy of Sciences, National University of Mongolia and other related institutions, an efficient biodiversity information system, utilizing contemporary techniques for digitalized data acquisition, storage, retrieval, processing and dataset harmonization, with the objective to gather, store and share results of biodiversity monitoring, research programmes and projects carried out with the support of public funding, and provide access to this system (with differentiated access and data administration levels) for all relevant stakeholders involved in nature conservation initiatives, and also promote retrieval of primary data, with*

*particular focus on retired scientists of the Mongolian Academy of Sciences and universities through dedicated programmes;*

- (d) *Establish and maintain a metadatabase on biodiversity.*

Rare and endangered species

The decline in numerous species populations and loss and degradation of their natural habitats are currently progressing at an alarming pace. The current scope of protective measures targeted at rare and/or endangered wild species of flora and fauna is not sufficient to mitigate the above processes and achieve progress under SDG Target 15.5. Furthermore, a considerable part of wildlife habitats and migration corridors of wide-ranging and globally significant species remains outside protected areas, in the "non-protected" 70 per cent of the country's territory.

Recommendation 11.2:

*The Ministry of Environment and Tourism should:*

- (a) *Evaluate the effectiveness of national action plans and programmes for the protection of rare and/or endangered species and, if necessary, consider their modification or adjustment;*
- (b) *Identify other rare and/or endangered species in urgent need of enhanced conservation and develop and implement relevant national action plans and programmes for their protection.*

Zoning of protected areas

Since the beginning of the 1990s, Mongolia has developed a national system of protected areas, which, in 2017, covers almost 30 per cent of the country's territory. However, the protected area network does not yet adequately safeguard the biodiversity values, as some natural ecosystems are underrepresented. Furthermore, the current zoning pattern in some protected areas does not provide for sufficient protection of important wildlife habitats. Addressing these challenges is important for Mongolia's progress in achieving SDG Targets 15.1 (By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements) and 15.4 (By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development).

Recommendation 11.3:

*The Ministry of Environment and Tourism should:*

- (a) *Evaluate the current internal zoning pattern of strictly protected areas and national parks, for the purpose of improving their conservation efficiency, in particular for the protection of mainstays, important habitats and migration routes of rare or endangered wild species;*
- (b) *Revise protected area zoning, prepare zoning maps based on GIS technology, make these available to protected area administrations and the public and modify the management plans of protected areas accordingly;*
- (c) *Extend the protected area network to include at least 30 per cent of each main ecosystem representative for Mongolia, and sites important for mountain biodiversity;*
- (d) *Introduce utilization of spatial planning tools in selection and expansion of the protected area network.*

Capacity for biodiversity conservation

The current human, technical and operational capacities for carrying out regular biodiversity monitoring, efficient protected area management and implementation of biodiversity conservation measures in the field are insufficient. Capacity-building becomes an urgent task in the light of both the planned extension of the protected area network and growing tourist pressures on protected areas. Through the provision of professional training and education on tourism facilities management, the negative impacts on biodiversity can be minimized and the quality of the visitor experience can be enhanced. Without enhancement of the current human, technical and operational capacities, the implementation of state policies and strategies related to biodiversity and protected areas, as well as the related achievement of SDG Targets 15.1, 15.4 and 15.5, might simply not be feasible.

Recommendation 11.4:

*The Ministry of Environment and Tourism, in cooperation with the Ministry of Education, Culture, Science and Sports, should support human and technical capacity-building of state agencies, research institutions and protected area administrations, in particular, but not limited to:*

- (a) *By provision of consistent professional training on, for example, population census of wildlife species, use of best practices and modern technology;*

- (b) *By provision of modern biodiversity-monitoring equipment, outdoor equipment and uniforms, off-road and specialized vehicles;*
- (c) *By increasing budgets and raising staff remunerations to a level attractive for skilled professionals, university graduates, young scientists and rangers, encouraging them to seek employment in the biodiversity conservation sector.*

Protected area management plans

Management plans for protected areas, based on scientific research and nature inventories, are indispensable tools for identifying and analysing threats to key species and ecosystems, defining conservation objectives and prescribing adequate protective measures to be applied in response to threats and pressures. In a situation where financial resources are limited or scarce, long-term planning is necessary for prioritizing the most urgent management challenges, and developing cost-effective annual conservation action plans and corresponding business plans, fundraising strategies and campaigns. Last, but not least, protected area management plans (especially if developed through a participatory process involving local stakeholders, and therefore supported by local communities) are a sound argument and convincing justification for requests for the allocation of budgetary resources and applications for financial support, from both available national and local funding sources and the international community and potential donors. The development of protected area management plans is also a tool contributing to achievement of SDG Targets 15.1, 15.4 and 15.5.

Recommendation 11.5:

*The Ministry of Environment and Tourism should support the development and/or revision of protected area management plans, in particular by involving the relevant international expertise, and ensure further implementation of protected area management plans.*

Policy framework and financing of protected areas

Due to a considerable number of gaps and shortcomings, and several contradictions, the 1994 Law on Special Protected Areas is currently under revision, together with the 1997 Law on Buffer Zones of Special Protected Areas. The revision process has continued for more than a decade, and the current thinking is to merge both Laws. Also, a new programme on special protected areas is to be developed in place of the 1998 National Programme on Special Protected Areas. Among other aspects, the new programme is to address the planned expansion

of the state network of protected areas and improve the management of protected areas.

Budgetary constraints are common in State-funded PAAs that cannot retain and use revenues from entrance fees. There is no legal requirement for land fees to be allocated for the maintenance and management of protected areas. In some NPs, the impact of vehicles that transport tourists are clearly felt.

Recommendation 11.6:

*The Government should:*

- (a) *Finalize the revision of the 1994 Law on Special Protected Areas to enable the Ministry of Environment and Tourism to address problems of the overlapped land use licenses, and adopt the revised Law;*
- (b) *Finalize and adopt the new programme on special protected areas foreseeing a roadmap on the planned increase of the special protected areas system, including the enhancement of its management capacity and budget;*
- (c) *Consider increasing entrance fees and provide that the revenues from entrance fees are returned to the collecting protected area, in order to enhance the management capacity of strictly protected areas and national parks;*
- (d) *Provide that land use fees from tourist facilities accrue to the protected area and are used to enhance the management capacity of strictly protected areas and national parks;*
- (e) *Provide that tourism facilities within the protected areas pay a percentage of gross income to the protected area in recognition of their privilege in being able to operate a private business in a strictly protected area or national park;*
- (f) *Ensure that tourism facilities within protected areas such as Khuvsgul and Gorkhi-Terelj National Parks provide their own transportation within the protected area in a sustainable way, to minimize the impact of driving on the land and habitat disturbance.*



## Chapter 12

# LAND MANAGEMENT

### 12.1 Current situation

The total area of the land territory of Mongolia is 156.412 million ha. Mongolia is the eighteenth largest country and the second largest landlocked country in the world. Northern Mongolia is covered by forest and mountain ranges, while desert, desert steppe and steppe areas cover the south. The western region is dominated by the Altai and Khangai Mountains and the east is covered by vast plains and wild heaths.

According to the revised 2002 Law on Land, land in Mongolia is classified into six categories: agricultural land; land of cities, villages and other urban settlements; land under roads and networks; land for special needs; land with forest resources (chapter 13); and land with water resources (chapter 9). In 2015, these six categories of land accounted for 73.5 per cent, 0.5 per cent, 0.3 per cent, 16.1 per cent, 9.2 per cent, and 0.4 per cent of the total land area, respectively (figure 12.1). Land for special needs encompasses multiple subcategories, including land of protected areas (chapter 11), land allocated for the purpose of ensuring national defence and land for scientific and technological tests and sites for regular environmental and climate monitoring.

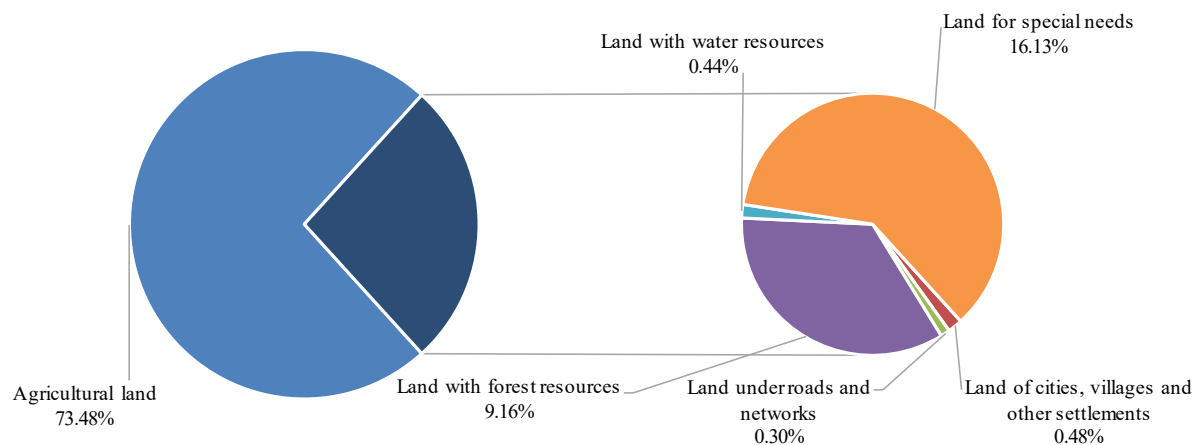
#### *Urban development*

Urbanization started in Mongolia in the 1950s, when only about 20 per cent of the population resided in urban areas. The urban population has increased from

1.053 million in 1987 to 2.096 million in 2015, accounting for 54.0 per cent and 68.6 per cent of the total population in 1987 and 2015, respectively. The annual growth rate of the urban population was 2.40 per cent between 1987 and 2015, 10 times of that of the rural population (0.24 per cent). Mongolians are increasingly abandoning the traditional nomadic way of life and moving into urban areas. From the historical predominance of nomadic and rural habitats, Mongolia is now overwhelmingly urban, with more than two thirds of its population living in cities and towns. Correspondingly, the area of land of cities, villages and other settlements, including lands under urban constructions and buildings, industrial and mining sites and urban common tenure land, has expanded from 523,600 ha in 1997 to 753,600 ha in 2016 (table 12.1).

Ulaanbaatar, the capital of Mongolia, dominates the urbanization of the whole country, accommodating nearly 46 per cent of the total population and 67 per cent of the nation's urban population. More than 60 per cent of Ulaanbaatar's population lives in peri-urban informal settlements, known as ger districts, which lack access to modern infrastructure such as piped water, sanitation, paved roads and public transportation. Unplanned expansion of the capital city and rapid migration from rural areas have brought many challenges, including unemployment, traffic congestion, air pollution, soil pollution and the extension of the ger districts.

**Figure 12.1: Categories of land, 2016**



Source: National Statistics Office, 2017.

Note: Of the category "Agricultural land", rangeland accounts for about 99 per cent. The category "Land with forest resources" is broader than the area actually covered by forests, which was 7.85 per cent of the country's territory in 2016.



*Agricultural practices*

Agricultural land, including rangeland, hayfields, cropland, lands for cultivation of fruits and berries, fallow lands, lands under agricultural constructions and other lands for agricultural production, occupies more than 70 per cent of the country's land area. It was

approximately 124.889 million ha in 1987 and decreased to 114.931 million ha in 2016 (figure 12.2), accounting for 79.8 per cent and 73.4 per cent of the total land area in 1987 and 2016, respectively. Agricultural land area dropped dramatically by 14.590 million ha from 2002 to 2003, as many areas were transformed into special protected areas.

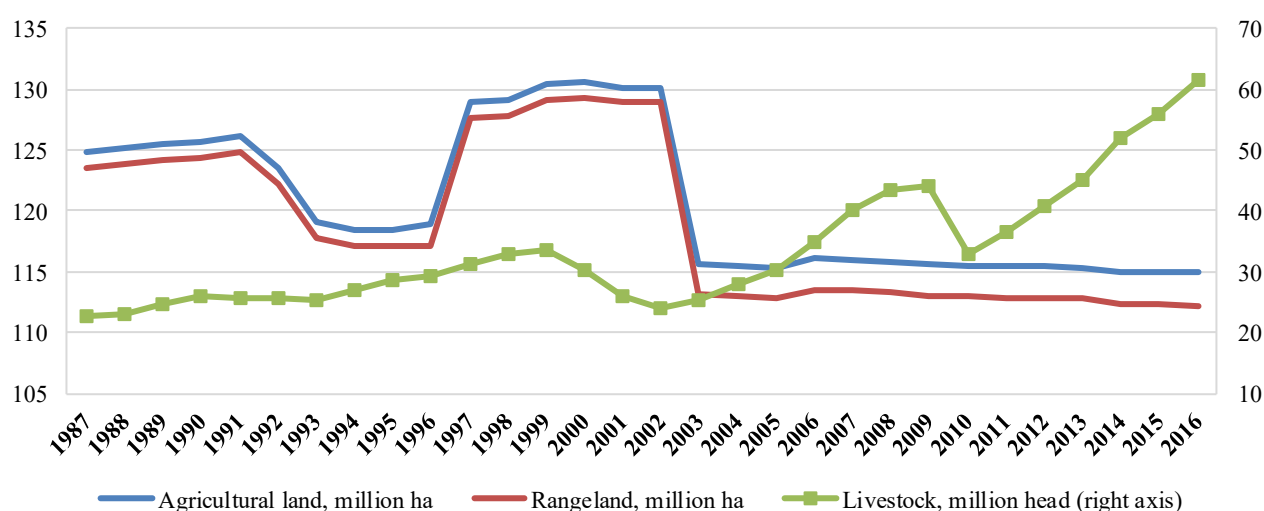
**Table 12.1: Areas of various categories of land, 1997–2016, million ha**

Period	Agricultural land	Land of cities, villages and other settlements	Land under roads and networks	Land with forest resources	Land with water resources	Land for special needs
1997	128.89	0.52	0.20	17.85	1.68	7.27
1998	129.13	0.38	0.33	17.85	1.67	7.06
1999	130.36	0.40	0.33	18.29	1.67	5.37
2000	130.54	0.42	0.34	18.29	1.67	5.16
2001	130.17	0.42	0.37	18.63	1.67	5.15
2002	130.17	0.43	0.36	18.63	1.67	5.15
2003	115.58	0.43	0.35	14.67	0.94	24.43
2004	115.46	0.44	0.35	14.69	0.97	24.50
2005	115.23	0.47	0.36	14.75	0.97	24.64
2006	116.04	0.49	0.36	14.30	0.67	24.56
2007	116.99	0.51	0.37	14.23	0.67	24.65
2008	115.82	0.53	0.37	14.23	0.67	24.79
2009	115.59	0.54	0.38	14.32	0.67	24.92
2010	115.53	0.62	0.41	14.30	0.68	24.88
2011	115.49	0.67	0.43	14.26	0.69	24.88
2012	115.40	0.70	0.44	14.26	0.69	24.93
2013	115.36	0.70	0.44	14.30	0.69	24.93
2014	115.01	0.71	0.45	14.32	0.69	25.23
2015	114.98	0.72	0.46	14.33	0.69	25.23
2016	114.93	0.75	0.47	14.33	0.69	25.23

Source: National Statistics Office, 2017.

Note: Total area: 156.41 million ha.

**Figure 12.2: Agricultural land, rangeland and livestock, 1987–2016**



Source: National Statistics Office, 2017.

### Rangeland and livestock

In 2016, rangeland accounts for around 97.7 per cent of the agricultural land. Whereas the term more commonly used in Mongolia is pastureland, this land should more accurately be described as rangeland because it grows primarily native vegetation and serves as a habitat for wildlife, including many grazers, predators and critically endangered birds, in addition to being used for nomadic livestock herding and haymaking.

The area of rangeland had decreased from 123.554 million ha in 1987 to 112.2 million ha in 2016, a decrease of 9.16 per cent. Meanwhile, the livestock population had increased by 2.7 times, from 22.741 million head in 1987 to 61.549 million head in 2016 (figure 12.2). Consequently, the density of livestock had increased from 18 head per hundred ha in 1987 to 54 head per hundred ha in 2016. This puts increasing pressure on the rangeland. In Mongolia, herds have free access to rangeland, which makes the overgrazing situation even worse. An assessment by the Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) indicates that the carrying capacity of rangeland was exceeded by more than 30 per cent. At the end of 2015, about 63 per cent of rangeland was severely overgrazed.

Along with the increase in the livestock population, the composition of livestock had changed substantially. In recent years, herders have paid more attention to goat breeding, due to increasing market demands for and the high price of cashmere. The proportion of goats in the total number of livestock had increased from 19.3 per cent in 1987 to 42.1 per cent in 2015, while that of other livestock, including sheep, cattle, horses and camels, continually declined.

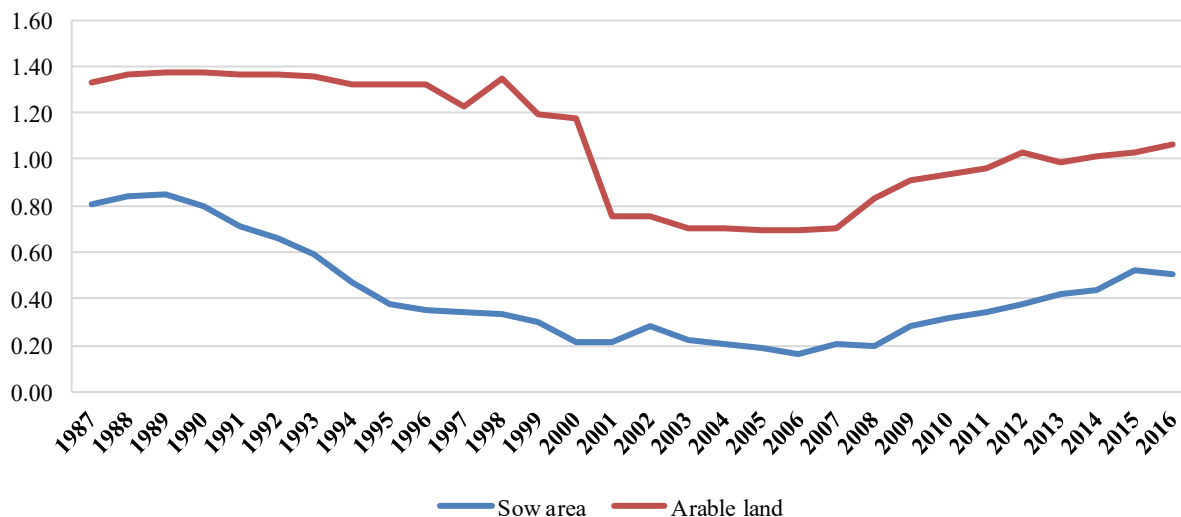
Goats are more harmful to rangeland compared with other livestock, due to their environmentally destructive grazing habits of not only eating grass leaves but also destroying grass roots.

### Arable land and crop production

Of the agricultural land, arable land accounts for less than 1 per cent. The arable land in Mongolia has declined from 1.334 million ha in 1987 to 1.067 million ha in 2016 (figure 12.3). Only part of the arable land is used for crop production. In the late 1980s and early 1990s, more than half of arable land was used for crop production. Since then the proportion of sow area in the total arable land has decreased, and was quite low between 1994 and 2008, with the lowest proportion, 18 per cent, in 2000. During this period, most of the arable lands were abandoned or left fallow. For this reason, in 2008, the Government of Mongolia launched the National Crop Rehabilitation Plan-III (2008 Government Resolution No. 70) to restore crop production.

The dry climate and the long winters limit the growing period to 80–100 days in the north and 120–140 days in the south, and make conditions for crop growing unfavourable. Cereals, including wheat, barley, oats, rye and buckwheat, are the most important crop, followed by potatoes and vegetables. In 2016, 377,800 ha is planted with cereals, 15,000 ha with potatoes and 9,050 ha with vegetables. Another 29,900 ha is used for forage growing. Following introduction of the National Crop Rehabilitation Plan-III, Mongolian agriculture produced sufficient wheat and potatoes for domestic demand. More than 60 per cent of the demand for vegetables was met by domestic production.

**Figure 12.3: Arable land and sow area, 1987–2016, million ha**



Source: National Statistics Office, 2017.

Unique climatic conditions and low precipitation require cultivating cold- and drought-resistant crops and the introduction of irrigation systems for crop production. Irrigation is mainly in the form of supplementary irrigation, when precipitation is insufficient to sustain the crop. In 1990, the irrigated area in Mongolia was 91,000 ha, of which more than 90 per cent was irrigated with surface water. The irrigated area decreased to 5,000 ha in 1998, and increased to 37,000 ha (about 10 per cent of the area under crops) in 2010. Currently, most crops are cultivated without irrigation, and crop yield largely depends on weather conditions.

In Mongolia, spring tilling coincides with intensive wind, and most cultivated areas are devoid of trees or other wind breaks. In the Gobi region, the average wind speed is 3–4 metres per second or even stronger, which can cause significant soil moisture loss and erosion. It is estimated that, over the past 30 years, an average of 35–50 tons of soil have been lost per hectare of cultivated land. Half of the cultivated land in Mongolia is considered to be degraded to some degree. New land brought under cultivation is mostly fodder pasture and a significant percentage of this area is marginal and environmentally unsuitable for crop production.

### *Forestry*

As of 2016, about 18.45 million ha are considered as forest land, representing 11.8 per cent of the country's total area. Of this, only 12.28 million ha, or 7.85 per cent of the country's territory, are actually covered by forests (figure 13.1). Unstocked forest areas make up 5.63 million ha; these are areas deforested due to forestry and/or non-forestry operations, overgrazing and repeated fires, and attacked by insects and diseases.

Forests in Mongolia can be divided into two broad types, i.e. the northern coniferous forests of the forest steppe, boreal forest and mountain zones, and the southern saxaul forests of the desert and desert steppe (annex IV, map 8). The northern boreal forests comprise 84.7 per cent of the total forested area. All forest resources are owned by the State.

The deforestation in Mongolia is mainly due to clearcutting for timber and fuelwood harvest, fire and insect infestations. According to the NSO, the annual

licensed forest harvest volume was 0.625 million m<sup>3</sup> from 1999 to 2015. Besides, each year about 1 million m<sup>3</sup> of timber and fuelwood are illegally cut – nearly twice the licensed figure. Unlicensed logging in Mongolia is mainly for three different purposes: securing basic subsistence needs, enhancing livelihoods and commercializing illegal logging. On average, there are 0.5 million ha of forest damaged by forest fires and 0.6 million ha of forest adversely affected by insects annually.

### *Transport*

The Mongolian road network has about 49,200 km of roads, of which 12,700 km are state roads and 36,500 km are local roads. State roads connect Ulaanbaatar and aimag centres. Although more and more paved roads were constructed, most vehicular mobility in Mongolia still relies on dirt tracks. More than 90 per cent of roads are dirt tracks, while paved and gravel roads account for less than 10 per cent. In 2009, the road network included only 2,680 km of paved roads, 2,100 km of gravel roads and an additional 1,730 km of improved earth roads. In 2013 and 2014, 2,656 km of paved roads were built and the length of paved roads increased to 5,300 km. In 2016, this increased to 7,500 km.

On the main national routes (total length, 12,700 km), more than 3 million ha of land is degraded due to dirt-track corridors with an average width of 164 metres. The remaining, less intensively used, routes (36,500 km) can predictably contribute to land degradation at least as much as national roads. Along the proposed two-lane Trans-Mongolian Highway, an average corridor width of 788 metres (equivalent to 225 lanes) is affected. This translates to 236,700 ha of land, whereas the construction of the paved 20-metre-wide Trans-Mongolian Highway takes only about 6,000 ha.

Off-road vehicles compact the ground and damage its ability to absorb and retain moisture and nutrients. Surface water flows are concentrated and accelerated, leading to soil erosion and increased sediment loads in watercourses. Full revegetation of damaged swathes takes 10–15 years after the track has ceased to be in use. Vegetation loss, erosion and degradation of such large swathes of land spur the ever-present threat of desertification. It is estimated that, in Mongolia, there are four times more vehicle tracks than necessary, causing 0.7 million ha of land degradation.

**Photo 12.1: Unpaved road**

### *Mining*

Mongolia is rich in mineral resources, having substantial deposits of coal, copper, gold, molybdenum, lead, nickel, aluminum, tin and bismuth. Mining is the largest industry and a major contributor to the economy. In 2016, the share of mining and quarrying in GDP stood at 20.1 per cent. In 2016, mineral commodities accounted for 70.86 per cent of Mongolia's exports.

The largest mining projects are the Oyu Tolgoi copper and gold mine and the Tavan Tolgoi coal mine, both located in the South Gobi Desert. Another prominent mining-based activity is Erdenet Mining Corporation. In 2013, there were 3,285 mining licences held by 1,753 companies, covering 17.5 million ha. In addition, there are a number of ASSM operations scattered throughout the country. The majority of

these (80–90 per cent) mine gold, while the rest exploit fluorspar and coal. They often occupy the sites of abandoned large-scale mining operations.

The growing mining sector poses new challenges to Mongolia's environment, including rangeland degradation, water pollution, soil pollution and wildlife habitat destruction. While exploration and mining activities by larger scale operations can be highly damaging, ASSM mining is also environmentally damaging as a result of uncontrolled use of chemicals. The top environmental issues related to mining include uncontrolled chemical waste from leachate and poor rehabilitation of abandoned mining sites. An estimated 100,000 ha of land have been degraded by coal and gold mining activities. Only a minimal amount of the land degraded by mining activities has been restored.

**Photo 12.2: Land degradation caused by mining**

#### *Waste management*

Data for all types of waste are estimated, and generation of MSW in urban areas is estimated from data provided by the authorities of Ulaanbaatar. Based on these estimates, citizens of Ulaanbaatar currently generate about 360 kg of household waste per person per year. In 2016, 1.7 million tons of MSW were collected in Mongolia, of which 40 per cent was in Ulaanbaatar. It is estimated that about 27,000–54,000 tons of hazardous waste is generated annually in Mongolia.

Currently, there is no proper solid waste management practice in Mongolia. Mongolia has about 400 central waste disposal sites in total, covering around 125,000 ha of land. The inadequate waste disposal system causes huge problems for the environment and human health. Domestic, industrial, construction and other forms of waste are currently deposited on the soil surface in large dumping sites on the outskirts of cities and towns, which causes soil pollution and land degradation. For instance, in Ulaanbaatar, there are only two waste disposal sites near the city and several open field areas.

#### *Soil degradation*

The impacts of wind on soil and vegetation cover are an integral part of land degradation. More than 60 per cent of the total territory of Mongolia is affected by wind erosion (annex IV, map 5). There is a high degree of wind erosion along the desert zone and in the Great Lakes Depression and the Valley of the Lakes. Soil erosion is most severe around the Baruun Khuurain Khotgor, Southern Altai Govi, Ulaan Nuur Lake and Mandal-Ovoo territories, because there is limited vegetation cover, little surface slope and limited barriers. It was estimated that 165.7 t/ha of soil is carried away by wind in these areas. Mongolia's steppe and desert steppe zones, especially the steppes of Dornod and areas of Zamyn Uud and Sainshand, belong to lands with a moderate degree of wind erosion. Soils of the mountain regions are not affected by wind erosion. Soil erosion due to wind has decreased on the west side of the Great Lakes Depression, along the Khar Us Lake and in the Buyant River basin.

Soil erosion by water has a slight impact on land degradation in Mongolia. Around 9 per cent of the

total territory is affected by such erosion (annex IV, map 6). It was estimated that approximately 300–400 tons of soil per annum are lost due to soil erosion by water. The intensity of soil erosion by water is mainly related to vegetation cover, surface slope, soil development and rainfall erosivity. The intensity of soil erosion by water is slight in the Great Lakes Depression, Valley of the Lakes and the eastern parts of Gobi with low mountains and depressions, which account for 92 per cent of the total areas affected by soil erosion by water. Severe soil erosion by water occurs in mountainous regions and along piedmont, especially in Mongol Altai, Gobi Altai and the Gobi-type piedmonts and southern parts of the Khangai and Khan Khukhii Mountains, which account for 4 per cent of the total areas affected by soil erosion by water. Soil erosion by water is moderate in the middle part of Mongolia, which is a vast area of grassland and major river basins. Soil erosion by water has increased in the northern parts of Mongolia, probably because of intensive rainfall and decreased vegetation cover.

## 12.2 Pressures from land degradation

Land degradation is one of the most serious environmental problems in Mongolia. Land degradation refers to reduction or loss of biological or economic productivity and complexity of land. A recent assessment of land degradation in Mongolia indicates that, in 2015, around 76.8 per cent of the total territory was degraded to some degree, with 24.1 per cent slightly degraded, 29.8 per cent moderately degraded, 16.8 per cent severely degraded and 6.1 per cent very severely degraded (table 12.2). The severely and extremely severely affected areas include dry and semi-desert lands of the Lake Uvs basin, the Great Lakes Depression and Dundgobi and Dornogobi Aimags (annex IV, map 7).

### *Forests and non-timber forest products*

Currently, timber and fuelwood may have an annual sale value of almost 200 billion tugriks, and over half of this value comes from unlicensed removals. Collected non-timber forest products (NTFPs) have a

total value of almost 16.5 billion tugriks annually, and more than 90 per cent of this value comes from unlicensed removals.

Degradation of forest land is expressed through a decline in the productivity of timber production and NTFPs. However, no assessment of the impacts of forest land degradation on productivity of timber production and NTFPs has been conducted in Mongolia to date.

### *Biodiversity and ecosystems*

The livestock herding pattern has changed from the former four-season pattern to the current two-season pattern, which leaves less time for rangeland to recover. This change has happened due to increased livestock numbers and the changes in the composition of livestock herds. The consequences of a changing livestock herding pattern and the overexploitation of land and plant resources, coupled with the effects of climate change, have led to a decline of animal and plant habitat areas and loss of resources, which has become the main contributing factor to the increase of species to be categorized as endangered.

### *Soil*

Land degradation leads to decreases in soil organic content and fertility. Soil fertility decreases and soil chemical properties change as a result of overgrazing and rangeland degradation. In Mongolia, soil organic matter content in overgrazed areas was 30–50 per cent lower and exchangeable calcium 40–60 per cent lower than in non-grazing areas. Land degradation was also found to affect physical soil water properties, increasing topsoil temperature and decreasing moisture content. Moreover, topsoil becomes denser and more compact as a result of livestock pressure on the soil surface, increasing bulk and particle density and making the soil more compact.

However, there is no assessment conducted in Mongolia on soil degradation.

**Table 12.2: Land degradation, 2006, 2010, 2015, per cent of total territory**

	Slightly degraded	Moderately degraded	Severely degraded	Very severely degraded	% of total territory
2006	23	26	18	5	72
2010	35.3	25.9	6.7	9.9	77.8
2015	24.1	29.8	16.8	6.1	76.8

Source: Desertification Atlas of Mongolia, 2017.

### *Vegetation*

The vegetation cover can be measured by using the normalized difference vegetation index (NDVI). The NDVI value in Mongolia differs from region to region. It is 0.05–0.18 in the Gobi Desert region, 0.2–0.35 in the steppe and forest steppe region and 0.4–0.5 in the forest steppe and forest region. During the last decade, the vegetation cover has been getting better in regions such as the Mongol-Daurian steppe, Eastern Gobi hollow, Southern Gobi undulating plains and along the Khangai Mountain chains, as the NDVI values in these regions increased. But the vegetation cover has a continuously decreasing trend in the Mongol Altai Mountains, Great Lakes Depression, Western parts of Khubsugul Mountain, Orkhon-Selenge River basin, Central Khalkha highlands and the Southern Gobi and Dariganga regions. Besides, the agricultural region is expanding to the north, and thus the arid steppe zone of eastern Mongolia is pushing the forest steppe zones to the north. As a result, the size of the high mountain and forest steppe zone is decreasing, and the size of the steppe and desert steppe zone is increasing.

### *Agronomic productivity*

The direct impacts of land degradation are experienced by land users mostly through declining agricultural productivity. Several principal processes are likely to lead to a decline in agricultural productivity as a result of land degradation. These include reduction in effective rooting depth, loss of plant nutrients and soil organic carbon, loss of plant-available water, loss of arable land area and damage to seedlings.

Almost 90 per cent of Mongolia's rangeland is vulnerable to land degradation and desertification. Pasture productivity has declined substantially in both desert and forest zones on winter and transitional pastures from 1997 to 2008, while it increased slightly on summer pastures, due to the increased presence of plant species that livestock did not eat and to there being less water in transitional pastures.<sup>15</sup> Specifically, total pasture productivity on the desert winter pasture declined by 78.8 per cent in 2008 compared with 1997, and forage standing crops on forest steppe pastures

averaged 544.6 kg/ha in 1997 and 443.1 kg/ha in 2008, a decline in forage productivity of 20 per cent.

### *Water resources*

Land degradation can lead to the siltation of rivers and lakes. Soil erosion releases fine particles of soil and nutrients into rivers and lakes after precipitation and floods. The accumulation of soil in rivers and lakes reduces the capacity of water basins to store water. In the Khomyn Tal area in the western part of the Mongolian sands, a large sandy desert land with brown soils was brought into cultivation, though it is not suitable for cropping. As a result, the productive soil was removed by wind erosion and some parts were lost to salinization. This further reduced groundwater tables in sandy desert land. Besides, land degradation may cause a rise in river water levels and increase the danger and risks of floods.

### *Development and well-being of local communities*

Though Mongolia is one of the most sparsely populated countries in the world, it has a high proportion of people living on degraded lands. Land degradation can have numerous impacts on local communities. These include the direct impacts of loss of income and employment, resulting in deterioration of the material standards of living, and diversion of time from education and social opportunities to production activities to increase labour input and compensate for deterioration in land productivity. There are also indirect impacts in terms of undermining the rural economic and social base, and health impacts from risks of exposure to degraded land, as well as changes to the way of life of local communities engaged in semi-nomadic pastoralism. Decrease in land productivity limits local residents' income sources and leads to poverty and increased migration to urban areas. Wind erosion has negative impacts on human health and causes damage to transport facilities. There are 145 settlements in the Gobi and steppe region that are experiencing sand burial and shifts. Compared with 1960, the number of days with dust and sand storm events has multiplied by 3–4 times, with 61–127 days of such events in the Gobi region and the Great Lakes Depression.

<sup>15</sup> Sheehy, D.P. and Damiran, D. Assessment of Mongolian rangeland condition and trend (1997-2009). Final report for

the World Bank and the Netherlands-Mongolia Trust Fund for Environmental Reform (NEMO), 2012.

**Photo 12.3: Salinization**

### 12.3 Impact from and adaptation to climate change

Climate change is pronounced in Mongolia, with an increase in annual mean temperature of 2.1°C between 1940 and 2014 and an accelerating trend in recent years. The 10 warmest of the past 70 years have occurred since 1997. While temperatures have been increasing, annual precipitation has been decreasing slightly in the southern and central areas of Mongolia. The seasonal rainfall pattern has changed, with gradually increasing winter precipitation but decreasing summer rain. In summer, the frequency of gentle and continuous rainfall covering large areas has decreased, and heavy and pouring rainfall covering small areas often occurs. Dryness has increased by 3–10 per cent in the deserts and by 10–15 per cent in the forest steppe and high mountain zones, due to a sharp increase in temperature and decrease in rainfall during the warm season.

#### *Impact of climate change*

Due to climate change in the last 20 years, net primary production on pasture declined by 5–13 per cent, more

than the average over the period 1961–1990 in the central and western parts of the eastern region. The reduction of the pasture biomass and the increase in heatwaves, which cause heat stress in animals, reduce the size of animals because they cannot gain sufficient weight through grazing.

Climate change has negative impacts on arable farming. The arable farming practised in Mongolia is characterized by high risk, as the crop yield can fluctuate up to 50 per cent depending on the weather, or it can even be lost altogether. The impact of climate change on arable farming is most visible in non-irrigated farming of food and fodder crops. Non-irrigated crop production is becoming more unstable. The yield of a non-irrigated field could decrease by 10–15 per cent with climate change. Wheat production might be decreased by 15 per cent by 2030 due to climate change.

The intensification of dry climatic conditions causes increased frequency of forest and steppe fires, and increased occurrence and intensity of forest insect and pest outbreaks. As a result, the forest area is reduced



by 0.46 per cent annually and forest resources have degraded significantly.

#### *Adaptation to climate change*

Some adaptation activities are already taking place. For example, every year, around US\$1 million is allocated from the state budget to facilitate scientific, environmentally sound measures against pest infestations and rodents. A monitoring system for rangeland and soil conditions has been established. In 2015, total cropland was accounted for 750,000 ha and 450,000 ha was reused cropland, which was once abandoned.

The vision for adaptation contained in the 2015 INDC is: to build livestock husbandry that maintains ecosystem balance through improving rangeland management; to achieve arable farming that meets the total national need in crops by reducing bare fallow and soil moisture loss, introducing medium- and long-term varieties of crops, increased irrigation with water-saving technologies, including snow and rainwater harvesting; and to reduce forest degradation and implement reforestation and sustainable forest management strategies.

### **12.4 Legal, policy and institutional framework**

#### *Legal framework*

The Law on Land was enacted by the State Great Khural in 1994. It was revised in 2002, and the new Law on Land went into effect in 2003. It regulates the possession and use of State-owned land by a citizen, entity and organization, and other related issues. It contains the basic principles of land resources management and allows for different forms of land tenure, i.e. land ownership, land possession and land use rights.

The revised 2002 Law on Land classifies land into six categories. Several laws were approved to regulate specific land uses of these categories of land. The 1994 Law on Special Protected Areas regulates the types and regime of protected areas and the 1997 Law on Buffer Zones of Special Protected Areas regulates the determination of buffer zones of SPAs and the activities therein (chapter 11). The 2012 Law on Forests regulates relations for the protection, restoration, forestation, tenure and use of forests and prevention of forest and steppe fires (chapter 13). The 2016 Law on Crop Production regulates cropland use and preservation of soils used in agriculture.

The 1997 Law on Land Fees regulates charges for use of land. The 1997 Government Resolution No. 152,

Annex 2, determines base fee rates and maximum and minimum rates for annual land fee payments (chapter 3). The 2002 Law on Allocation of Land to Mongolian Citizens for Ownership regulates the allocation procedure and the types and sizes of land to be owned. In addition, land cadastre establishment and operation is regulated by the 1999 Law on Cadastre Mapping and Land Cadastre.

Mongolia has a specific law for protecting soil and combating land degradation. The 2012 Law on Soil Protection and Desertification Prevention aims to facilitate measures to prevent soil damage and soil fertility decline from overgrazing and desertification. It includes measures to prevent desertification from intensification of agriculture, mining, road construction and urban use, as well as from climate change (chapter 1).

The work to develop a law on rangeland started in 2011; however, the drafting process is still ongoing. The idea behind this draft law is to move to a more regulated rangeland planning and management system. It is envisaged that the new law will regulate rangeland relations in line with the carrying capacity of rangeland and support the sustainable use of land used for pasturing through the introduction of fees for the use of rangeland and earmarking a certain amount of revenues for rehabilitation measures.

As of 2017, a process to revise the 2002 Law on Land is under way. Among other aspects, it is envisaged that the revision will: address land classification by revising it in accordance with international practice; revise planning of land management; introduce an integrated land registration system to include information on land ownership, planning and cadastral registration; and address issues on land taxation, fees, land rehabilitation and land dispute resolution. The revision would touch upon the entire package of land-related legislation, including the 2002 Law on Allocation of Land to Mongolian Citizens for Ownership, the 1999 Law on Cadastre Mapping and Land Cadastre, the 1997 Law on Geodesy and Cartography and the 2003 Law on State Registration of Property Ownership and Other Related Property Rights.

#### *Policy framework*

#### 2016 Mongolia Sustainable Development Vision 2030

The 2016 SDV 2030 (chapter 1) includes an important target to decrease the area of desertified land to 60 per cent of the territory by 2030, against the baseline of 78.2 per cent in 2014. Other relevant targets, to be

achieved by 2030, are to increase the area of SPAs to 30 per cent and raise the forest cover to 9 per cent of the country's total territory.

2014 Green Development Policy and 2016 Action Plan for the Implementation of Green Development Policy for the period 2016–2030

The 2014 Green Development Policy aims to reduce the impact of desertification, land degradation and drought (DLDD) by creating conditions to minimize and reduce the human impact on the environment in periods of rapid economic growth and climate change. It sets the objective to promote efforts aimed at reclaiming at least 70 per cent of degraded, polluted and abandoned land from industrial activities and reusing it for various economic purposes.

The relevant outcomes and indicators of the 2016 Action Plan for the Implementation of Green Development Policy for the period 2016–2030, to be achieved by 2030, include:

- At least 70 per cent of all degraded and eroded land is rehabilitated;
- Up to 10 per cent of the total lands used for pasture of each soum is rotated by relieving livestock grazing, rehabilitated, and then reserved as an otor zone;
- Abandoned croplands covering 450 thousand ha are rehabilitated and cultivated;
- The cropland irrigation area reaches 100 thousand ha;
- Forest zones are established in an area of at least 1,000 ha in deserted and degraded sites;
- The forest covered area is increased by 1.9 million ha by stopping forest degradation.

2016 Governmental Action Programme for the period 2016–2020

The 2016 Governmental Action Programme for the period 2016–2020 contains the following land-related policies:

- Create a general land policy framework and improve the legal regulation of land utilization, possession and ownership;
- Improve rangeland use and protection, decrease degradation and desertification and increase herders' involvement in the fight against rodents and insects by using eco-friendly, advanced methods;
- Develop comprehensive plant protection measures and prevent damage to cropland from soil erosion and degradation and gradually

introduce zero-tillage technology, crop rotation and measures to improve soil fertility;

- Construct new and renovate existing irrigation systems and promote the introduction of advanced irrigation techniques and technologies;
- Pursue policies to protect soil, to decrease its degradation and to carry out rehabilitation of areas that have degraded due to mining exploration and exploitation activities.

2010 National Action Programme to Combat Desertification 2010–2020

The overall objective of the 2010 National Action Programme to Combat Desertification (2010 Government Resolution No. 90), covering the period 2010–2020, is to prevent, cope with and revert desertification and land degradation in Mongolia to ensure environmental sustainability, improve livelihoods of the rural population and generate environmental services of global importance. In order to achieve the overall goal, the following priorities and associated measures have been determined:

- Strengthening institutional capacity: Improving the institutional framework of the National Committee on Combating Desertification; implementing government policy, objectives and actions with regard to coping with desertification effectively; generating financial resources from the state budget, local budget and special funds; and capacity-building;
- Improving the legal and policy framework: Developing an effective and favourable legal and policy framework for combating, coping with and preventing desertification;
- Enhancing science, technology and knowledge: Establishing an integrated monitoring network for assessing land degradation and desertification; developing a nationwide integrated database for desertification; and creating a database of approaches and technologies for coping with desertification and land degradation;
- Increasing advocacy, awareness-raising and education: Increasing the awareness of children and young people about the environment and desertification; improving knowledge on causes and consequences of desertification and providing information to increase public participation; and providing science-based information to policymakers and decision-makers.
- Intensifying concrete actions at the grassroots level, and increasing investment: Intensifying practical actions in support of the National

Action Programme to Combat Desertification and strengthening management of nature conservation and natural resources use; adopting a sustainable natural resources management plan; and increasing the participation of land users in restoration of degraded areas.

*Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Target 15.3 of the 2030 Agenda for Sustainable Development is described in box 12.1.

*Institutional framework*

The Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) is responsible for dealing with land-related matters. Under the revised 2002 Law on Land and within the land reform, ALAMGaC was established in 2002 by merging three governmental agencies, i.e. the Land Management Authority, the State Administration of Geodesy and Cartography and the Real Property Registration Agency. In 2006, the Real Property Registration Agency was separated from ALAMGaC and formed into the Administration of State Registration of Titles. ALAMGaC worked under the Prime Minister from 2000 to 2004, and has

been working under the Ministry of Construction and Urban Development since 2004. It has branch offices in the Ulaanbaatar City and all 21 aimags, with one land officer in each soum.

ALAMGaC is the regulatory agency of the Government for land issues. The activities of ALAMGaC mainly include land use planning and management, cadastral surveying and mapping, geodesy and cartography. ALAMGaC is in charge of implementing government policies on land-related issues, land management planning, conducting cadastral surveying and mapping, establishing a national land information system and national spatial data infrastructure, and providing land-related data and information to the public.

The Ministry of Food, Agriculture and Light Industry is responsible for pasture and cropland management. The Ministry of Environment and Tourism is responsible for managing protected areas, forest and water resources. The Ministry of Mining and Heavy Industry is responsible for the mining cadastre (chapter 2). The Ministry of Roads and Transport is responsible for roads, in particular for increasing the number and length of paved roads. There are no formal mechanisms for coordination on land management and land degradation prevention issues among these ministries.



**Box 12.1: Target 15.3 of the 2030 Agenda for Sustainable Development**

**Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

**Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world**

In Mongolia, around 76.8 per cent of the total territory experienced land degradation to some degree in 2015, with 24.1 per cent slightly degraded, 29.8 per cent moderately degraded, 16.8 per cent severely degraded and 6.1 per cent very severely degraded (table 12.2). Mongolia has already set a national target under SDG Target 15.3, measured by Indicator 15.3.1: Proportion of land that is degraded over total land area. The country aims to restore not less than 70 per cent of degraded land and decrease the area of desertified land to 60 per cent of total territory by 2030.

Mongolia has put in place the legal, policy and institutional mechanisms for working on combating land degradation. The 2012 Law on Soil Protection and Desertification Prevention provides guidance to prevent soil damage and soil fertility decline from desertification, and mechanisms to prevent soil erosion. The 2010 National Action Programme to Combat Desertification 2010–2020 outlines the priorities and associated measures for combating desertification. Mongolia has a network for monitoring land degradation and desertification under the Ministry of Environment and Tourism. However the Programme has not been effectively implemented, due to limited financial resources, limited technology, weak coordination among the relevant sectors and limited capacity.

To achieve Target 15.3, Mongolia needs to not only mobilize more domestic and international financial resources and foster capacity-building for combating land degradation, but also learn and transfer advanced knowledge and practical technologies of sustainable land management from other countries and international organizations. Additional measures include improving the national monitoring network for land degradation by including the three land degradation neutrality (LDN) indicators (i.e. land cover and land cover change, land productivity, and carbon stocks above and below ground).

Mongolia has a network for monitoring land degradation and desertification, which consists of 1,500 points throughout the country. NAMEM, under the Ministry of Environment and Tourism, is responsible for conducting land degradation and desertification monitoring.

#### *Regulatory and economic measures*

Only Mongolian citizens and economic entities can be long-term possessors of land. Land possession is not equivalent with land ownership; rather, it is the temporary lease of land in accordance with its purpose of use. The size of land to be allocated to families is up to 0.07 ha in Ulaanbaatar City, up to 0.35 ha in the cities of Darkhan and Erdenet, and up to 0.5 ha in aimag centres, soum centres and villages.

The tax base for the user fee is the value of the land, which is established by the Government. For cities, villages and other settlements, the tax rate is within a range of 0.01 to 1 per cent of the land value; it can be up to 3 per cent if the land is in an SPA. The annual fee rates range from 44 tugriks (US\$0.02) to 440 tugriks (US\$0.18) per m<sup>2</sup> (chapter 3). Herders are exempt from payment of annual land fees for the use of rangeland and hayfields.

In StrPAs and NPs, it is prohibited to conduct a number of activities related to land use, according to the 1994 Law on Special Protected Areas. Such activities include: changing natural features of the land by ploughing, digging, using explosives, mining, or quarrying sand or stone; harvesting and processing secondary natural resources or medicinal plants for commercial purposes; and conducting any activities that pollute the soil, water or air.

### **12.5 Participation in international agreements and processes**

#### *Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*

Mongolia has been a party to the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) since 1996. It regularly participates in the COP, the meetings of the Committee for the Review of the Implementation of the Convention (CRIC) and other relevant meetings.

With assistance from UNEP, UNDP and ESCAP, Mongolia developed its first National Action Plan to Combat Desertification in 1996 (1996 Government

Resolution No. 169) and renewed it in 2003 (2003 Government Resolution No. 141). According to Mongolia's Fourth National Report to the UNCCD in 2010, the implementation of the first National Action Plan to Combat Desertification did not meet the expected results, due to limited financial sources, limited sources of knowledge and technology, weak coordination among the relevant sectors and limited capacity. The current National Action Programme to Combat Desertification (2010 Government Resolution No. 90), covering the period 2010–2020, is in line with the COP 9 strategy of the UNCCD.

#### *Northeast Asia Desertification, Land Degradation and Drought Network*

Mongolia, the People's Republic of China and the Republic of Korea founded the North East Asia Desertification, Land Degradation and Drought Network (DLDD-NEAN) in 2011 by expanding the Northeast Asia Forest Network. The functions of DLDD-NEAN include to: (i) address issues relating to desertification and dust and sandstorms; (ii) cooperate in addressing other relevant forest issues that contribute to the prevention of desertification and land degradation; and (iii) contribute to sustainable forest management and sustainable land management.

The Steering Committee Meeting and Forum/Workshop are held annually. Mongolia actively participated in all meetings, and hosted the DLDD-NEAN meetings twice in Ulaanbaatar. A pilot project, Joint Demonstration Project for Prevention and Control of Dust and Sandstorms Originated in Erlinhot, China, and Zamiin Uud, Mongolia, Source Areas, was conducted between 2012 and 2016.

### **12.6 Assessment, conclusions and recommendations**

#### *Assessment*

Rangeland accounts for most of the total land area of Mongolia, followed by land for special needs and land with forest resources. In recent years, the areas of rangeland, land with forest resources and land with water resources have decreased, while the area of land for special needs has increased dramatically. This is mainly because more and more ecologically fragile land was transformed into SPAs. With rapid urbanization and road construction, more land was used for urban and transport construction.

The most important and obvious environmental problem relating to land resources is land degradation and desertification. Most land degradation occurs on rangeland, followed by forest resources land and

cultivated areas. Both climate change and human activities contribute to the degradation of rangeland. The pressures on rangeland from human activities include overgrazing, mining, unpaved multitrack roads and urbanization. The pressures on forest resources land are from illegal logging, forest fires and insect infestations. The degradation of arable land is mainly due to abandonment of cropland. Land degradation has adverse effects on soil and water resources, causes decline in land productivity and eventually impairs the development and well-being of local communities. However, there is still no systematic assessment on these negative externalities of land degradation in Mongolia.

Mongolia has set ambitious targets to restore not less than 70 per cent of degraded land and decrease the area of desertified land to 60 per cent of total territory by 2030. These targets represent the country's national commitments under Target 15.3 of the 2030 Agenda for Sustainable Development (By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world). Mongolia has taken steps to advance its legal and policymaking framework to prevent land degradation and combat desertification, through the adoption of the 2012 Law on Soil Protection and Desertification Prevention and the 2010 National Action Programme to Combat Desertification, covering the period 2010–2020. Nonetheless, practical implementation of the envisaged policies faces challenges in view of the limited financial resources and inadequate level of institutional coordination.

### *Conclusions and recommendations*

#### Legal framework and planning

The legal framework for land resources management is relatively complete in Mongolia, with the revised 2002 Law on Land as an overarching framework and the 2012 Law on Soil Protection and Desertification Prevention specifically targeted at prevention of desertification and land degradation. A process to revise the 2002 Law on Land is under way; it is expected to touch upon the entire package of land-related legislation.

The 1994 Law on Special Protected Areas and the 1997 Law on Buffer Zones of Special Protected Areas regulate land for special needs, the 2012 Law on Forests regulates land with forest resources and the 2016 Law on Crop Production regulates the use of agricultural land for crop production. However, Mongolia lacks a law for regulating the use of rangeland, which has remained in a draft version for a

number of years. The adoption of a law on rangeland is important, because rangeland accounts for more than 70 per cent of the total territory of the country and because most land degradation occurs on rangeland. Such a law would enable sustainable management of rangeland. Besides, some of the recently adopted laws, especially the Law on Crop Production, are not effectively implemented due to the lack of subsidiary legislation to guide their implementation.

More than 60 per cent of Ulaanbaatar's population lives in peri-urban informal settlements, known as ger districts, which lack access to modern infrastructure. Unplanned expansion of the capital city and rapid migration from rural areas have brought many challenges, including unemployment, traffic congestion, air pollution, soil pollution and the extension of the ger districts.

#### Recommendation 12.1:

*The Government should:*

- (a) *Finalize and adopt the law on rangeland;*
- (b) *Revise the package of land-related legislation, including by bringing it into line with the 2016 Law on Crop Production;*
- (c) *Improve the mechanism for development of land management plans to ensure cooperation between governmental agencies and organizations at different administrative levels;*
- (d) *Promote the upgrading of existing ger districts by providing their inhabitants with access to modern infrastructure such as piped water, sanitation, paved roads and public transportation;*
- (e) *Prevent unplanned extension of ger districts.*

#### Coordination and cooperation

The institutional framework for land resources management has improved since the early 1990s. ALAMGaC under the Ministry of Construction and Urban Development is responsible for dealing with most land-related issues. However, land planning and management issues are also regulated by and require close cooperation and coordination with several other ministries or agencies. The Ministry of Food, Agriculture and Light Industry is responsible for the management of agricultural land, including rangeland and cropland. The Ministry of Environment and Tourism is responsible for managing protected areas, forest and water resources. The Ministry of Mining and Heavy Industry is responsible for the mining licensing process and mining cadastre. The Ministry of Roads and Transport is responsible for roads, in particular for increasing the number and length of paved roads. There is a lack of overall cooperation and

coordination mechanisms for land management among the relevant bodies.

Recommendation 12.2:

*The Government should establish overall coordination mechanisms for integrated land management among the relevant ministries and agencies, to ensure effective cooperation and practical action on:*

- (a) *Sustainable management of rangeland and cropland;*
- (b) *Protection of land with forest and water resources, as well as land for special needs;*
- (c) *Mitigating land degradation from mining and from the use of unpaved roads, and supporting post-mining rehabilitation of degraded land;*
- (d) *Applying international standards, such as e.g. CORINE land cover, to update and maintain land cover information and database.*

See Recommendation 1.4(f).

Resources and international cooperation

As a party to the UNCCD, Mongolia developed its first National Plan of Action to Combat Desertification in 1996, updated it in 2003 and is currently implementing the National Action Programme to Combat Desertification, covering the period 2010–2020. However, the first Plan was not effectively implemented, due to limited financial resources, limited sources of knowledge and technology, weak coordination among the relevant sectors and limited capacity.

At the regional level, Mongolia, the People's Republic of China and the Republic of Korea co-founded the Northeast Asia Desertification, Land Degradation and Drought Network. Mongolia participates in all meetings and joint projects addressing regional issues related to land degradation, in order to contribute to achieving the goal of land degradation neutrality in northeastern Asia.

Recommendation 12.3:

*The Government should:*

- (a) *Mobilize additional domestic and international financial resources and foster capacity-building for effective implementation of the 2010 National Action Programme to Combat Desertification, covering the period 2010–2020;*

- (b) *Build capacity and benefit from learning and transfer of advanced knowledge and practical technologies of sustainable land management from its partner countries and by collaboration with international organizations.*

Land degradation neutrality indicators

Mongolia's network for monitoring land degradation and desertification consists of 1,500 points throughout the country. NAMEM, under the Ministry of Environment and Tourism, is responsible for conducting land degradation and desertification monitoring. The information on three land degradation neutrality (LDN) indicators (i.e. land cover and land cover change, land productivity, and carbon stocks above and below ground) is currently not collected. The operational capacity to produce information and data on these three subindicators, and thus to enable the country to effectively monitor its efforts and report under SDG Target 15.3, does not exist.

Recommendation 12.4:

*The Ministry of Environment and Tourism, in cooperation with the National Statistics Office, should initiate data collection for the three LDN indicators.*

Data

Apart from the lack of coordination mechanisms for integrated land management among the relevant ministries and agencies, the lack of a unified database on land and land use is an issue. The primary responsibility for maintaining a national information system on land and for providing land-related data to governmental institutions and the public lies with the Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC). However, to ensure the meaningful use of land-related information for policymaking and decision-making, a database on land and land use requires input from various governmental institutions at different levels.

Recommendation 12.5:

*The Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC), in collaboration with the Ministry of Food, Agriculture and Light Industry and the National Statistics Office, should establish a database on land and land use, including data on crop and hay yield production, which will be filled by relevant institutions while ensuring data quality, consistency, flow and interoperability.*



## FORESTRY AND ENVIRONMENT

### 13.1 Description of the current situation

#### *State of forests*

#### Classification

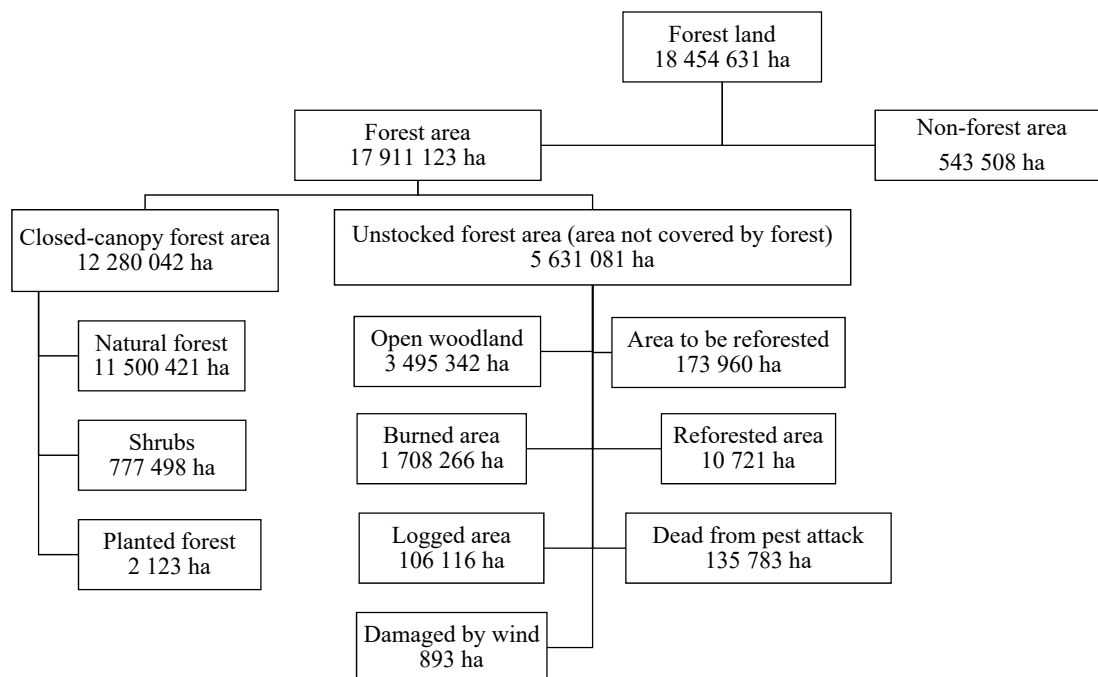
In Mongolia, the term "forest land" is used to refer to both forested areas and non-forest areas and the surrounding environment, including the area needed for forest growth. Forest land includes forested areas, planted forests, bush and shrub stands, logging areas, forests damaged by forest and steppe fire, insects and diseases, glades, and an area of 100 metres outside the forest edge, as well as seedlings and tree nursery areas. Non-forest areas include grasslands, shrub lands, wetlands and agricultural areas. Therefore, the revised 2012 Law on Forests defines forest land as a form of land use rather than forest cover and includes areas not covered by forests in addition to the forested areas.

As of 2016, about 18.45 million ha are considered to be forest land, representing 11.8 per cent of the country's total area. This includes 17.91 million ha of forest area, of which 12.28 million ha, or 66 per cent of the total forest land and 7.85 per cent of the

country's territory, are actually covered by forests. The forest area not covered by forests or unstocked forest area is 5.63 million ha. These unstocked forest areas are areas that have been deforested due to various disturbances, such as forestry and/or non-forestry operations, overgrazing, overexploitation for fuelwood and timber, repeated fires and attacks by insects and diseases (figure 13.1). These areas are expected to be regenerated. Non-forest areas (0.54 million ha) include areas within forest land, which include high mountain sub-alpine tundra vegetation, mountain slopes, rocky areas, meadows and tree nurseries.

With less than 10 per cent of the total land area under closed forest, Mongolia is considered to be a "low forest cover" country according to the FAO definition. However, due to its small population (3.12 million people) and vast territory, and thus its low population density (2 inhabitants/km<sup>2</sup>, one of the lowest in the world), Mongolia is not designated a "low forest cover" country on the basis of its ratio of forested area per capita, which is 4.09 ha/capita (the global ratio is 0.54 ha/capita).

**Figure 13.1: Classification and areas of forest land, 2016**



Source: Forest Research and Development Centre, Ministry of Environment and Tourism, 2017.



### Distribution

Forests are mainly located in the north-central parts of the country, forming a transition zone between the Great Siberian boreal forest and the Central Asian steppe desert. Forests in the northern part of the country represent the southern edge of the boreal forest.

The forested areas of Mongolia can be divided into two types: northern coniferous and deciduous forests and southern saxaul forests (annex IV, map 8). The northern boreal forests comprise 84.7 per cent of the total forested area. The most common tree species are Siberian larch (*Larix sibirica*), Siberian pine (*Pinus sibirica*), Scots pine (*Pinus sylvestris*), Siberian spruce (*Picea obovata*), Siberian fir (*Abies sibirica*) and a smaller, broad-leafed component composed of birch (*Betula platyphylla*), aspen (*Populus tremula*) and poplar (*Populus diversifolia*). The southern saxaul forests cover 15.3 per cent of the country's forested land and consist primarily of saxaul (*Haloxylon ammodendron*) and other species such as tamarix (*Tamarix spp.*) and *Caragana*. The saxaul vegetation is a unique feature of Mongolia's semi-desert and desert ecosystems and has important ecological, cultural and economic functions. These forests protect the land against erosion and desertification, and provide fodder for livestock and fuelwood.

### Composition and age

Forests consist of more than 140 tree and shrub species. Siberian larch is the dominant species in terms of both area (62.5 per cent) and volume (78.6 per cent).

The average age of coniferous trees is 133 years and of deciduous trees, 46 years. In terms of forest age structure, the recent Multi-Purpose National Forest Inventory has shown that the major part of the Mongolian boreal forest is overmature, with 74.07 per cent of forest stands classified as mature or overmature, 14.16 per cent classified as submature, 11.29 per cent classified as middle aged and 0.48 per cent classified as young. As for the saxaul forest, 34.95 per cent is overmature, 51.82 per cent is mature, 11.55 per cent is reaching maturity, 1.28 per cent is middle aged and 0.4 per cent is young. Consequently, forests are not only less productive but also more prone to fires and pest attacks and are less resilient to climate change. The result is forest degradation and, ultimately, deforestation.

The total growing stock of Mongolian forests equals 1.24 billion m<sup>3</sup>, of which Siberian larch represents 78.54 per cent, Siberian pine 9.39 per cent, Scots pine 4.99 per cent, spruce 0.22 per cent, fir 0.02 per cent, broadleaf trees 6.70 per cent and saxaul 0.14 per cent (table 13.1). The volume increment per hectare for coniferous forests is 1.14 m<sup>3</sup>/ha and for broadleaf forests, 0.98 m<sup>3</sup>/ha, and the annual increment is, on average, 1.036 billion m<sup>3</sup>.

### *Administrative zones*

According to the revised 2012 Law on Forests, Mongolia's forests are divided into two administrative zones for the purpose of forest resources management: protected and utilization forest zones. As of 2016, 79.5 per cent of the total forest land is classified under protected forest and 20.5 per cent under utilization forest zone.

**Table 13.1: Growing stock by species, 1997, 2007, 2008, 2010, 2012, 2014, 2016, million m<sup>3</sup>**

Tree species	1997	2007	2008	2010	2012	2014	2016	% total growing stock 2016
Siberian larch	1 017.10	1 033.00	1 074.90	1 058.50	1 035.10	977.10	978.10	78.54
Siberian pine	163.50	150.50	129.80	126.80	120.80	116.10	116.90	9.39
Scots pine	90.50	97.10	86.70	66.70	63.70	61.80	62.10	4.99
Siberian spruce	3.60	3.40	4.30	3.60	3.60	2.90	2.80	0.22
Siberian fir	0.38	0.30	0.30	0.20	0.20	0.20	0.20	0.02
Broadleaf species ( <i>birch, aspen, poplar and willow</i> )	86.25	93.50	97.80	92.20	91.90	83.17	83.45	6.70
Saxaul	1.40	1.40	1.50	1.50	1.80	1.80	1.80	0.14
Tamarix					0.01	0.03	0.03	0.00
<b>Total</b>	<b>1 362.73</b>	<b>1 379.20</b>	<b>1 395.30</b>	<b>1 349.50</b>	<b>1 317.10</b>	<b>1 243.07</b>	<b>1 245.35</b>	<b>100.00</b>

Source: Ministry of Environment and Tourism, 2017.

### Protected forests

Protected forest zone comprises sub-tundra forests, forests in SPAs, forest areas designated for training and research, green belts, saxaul forests, forest patches up to 100 ha and forests that are on meadow slopes of more than 30 degrees gradient. Furthermore, forests around water bodies such as rivers and lakes, or around cities, towns, roads and railways, are protected. Any activity other than construction of roads and bridges, electrical and telecommunication lines, forest maintenance work and use of NTFPs is not allowed in a protected forest zone.

The revised 2012 Law on Forests states that the Law on Special Protected Areas regulates the protection regimes for forests in SPAs. Limited forest exploitation is permitted in NPs, NRs and cultural monuments, mostly for local subsistence needs, such as collection of fuelwood and NTFPs.

### Utilization forests

According to the Multi-Purpose National Forest Inventory (2014–2016), about 1.9 million ha (20.5 per cent) of the forest area is designated for production (commercial) purposes, of which 1.5 million ha is through agreements with 915 officially registered forest user groups, and 0.4 million ha is through concession contracts with private enterprises. The remaining boreal forest area, 4.4 million ha, has not yet been designated for any exploitation.

### *Forests in special protected areas*

According to data from 2000, 17.3 per cent of the total forest fund was under the state SPA system, of which

67.2 per cent was in StrPAs, 32.1 per cent in NPs and 0.7 per cent in NRs. Furthermore, 34.2 per cent of saxaul forest was included in state SPAs in 2000.

There are no recent data available on the percentage of the forest fund that is inside SPAs, whether state or local. In 2017, the system of state SPAs encompasses 27,953,449.98 ha in total (17.87 per cent of the country's territory) (chapter 11).

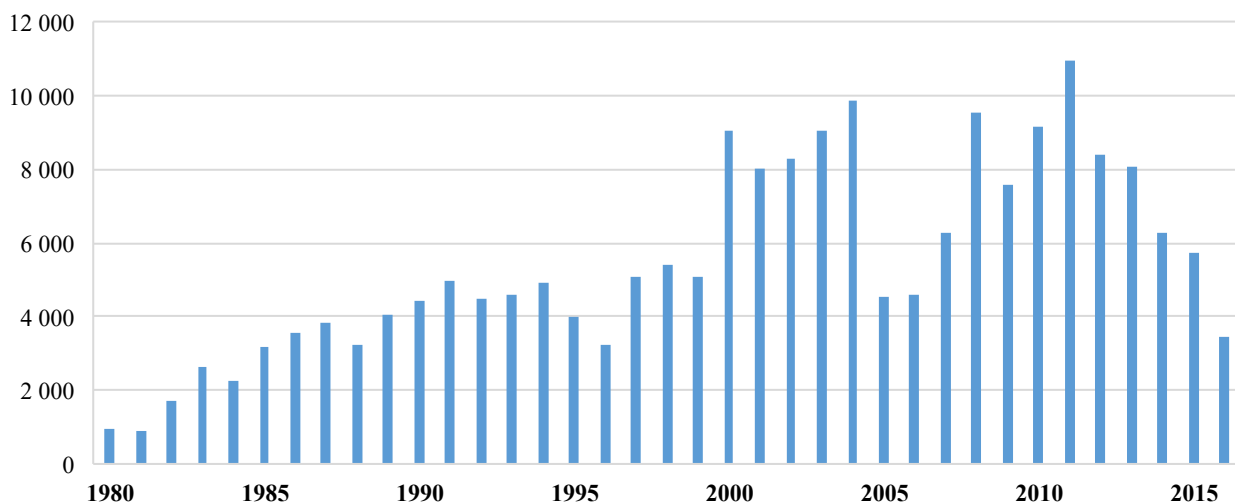
According to the Multi-Purpose National Forest Inventory (2014–2016) and ECE secretariat's estimates for saxaul forests, to date, 3.1 million ha of the forest area, including both boreal and saxaul forests, are located inside SPAs, which corresponds to nearly 25 per cent of the total forest area covered by forests, but just 1.98 per cent of the country's territory.

### *Reforestation and afforestation*

The practice of reforestation started in 1968 in Mongolia. Reforested areas have increased from 50 ha per year in the early 1970s to 1,000–2,000 ha between 1980 and 1984, and 4,000–5,000 ha between 1990 and 1994. Starting from 2000, 8,000–9,000 ha of land is reforested annually. Between 1980 and 2016, 201,145 ha of land were reforested (figure 13.2).

Reforestation activities include tree planting in areas where logging operations have been carried out or areas affected by fires, the creation of forest strips, and supporting natural regeneration in the forests and tree nurseries for the preparation of seeds and seedlings for plantation. Reforestation with seeds and seedlings is conducted in spring and autumn using 2–3-year-old seedlings.

**Figure 13.2: Reforested areas, 1980–2016, ha**



Source: State of the Environment Report 2015–2016, Ministry of Environment and Tourism, 2017.

The reforestation success rate seems rather low. The 2006 World Bank study, "Wood Supply in Mongolia: The Legal and Illegal Economies", assessed the success of 19 planting sites in the central and northern parts of the country and concluded that the mean survival rate was 12 per cent. In addition to the harsh climate, there are several factors that affect the low survival rate of trees, such as cattle grazing, forest fire and the quality of plantation operation. The survival rate could be increased by increasing nurturing and maintenance, i.e. watering after plantation, fencing planted areas and choosing northern slopes for planting.

Afforestation efforts have been undertaken as part of the large-scale Green Belt afforestation programme (2005 Government Resolution No. 44). These efforts aim to reduce soil erosion and halt desertification in the southern part of the country by building a green belt or green strips of vegetation cover that consists of trees, shrubs and herbal plants. The Programme has three stages (2005–2015, 2016–2025 and 2025–2035). As a result of the first stage, 5,302 ha have been afforested (table 13.2).

### Non-timber forest products

NTFPs include pine nuts, mushrooms, medicinal and aromatic herbs and berries, and are very important for local people for their consumption and for income generation. NTFPs also include wild animal furs, deer antlers for medicinal purposes and game meat (table 13.3).

## 13.2 Pressures on forests

### Forest fires

Forest fires have been responsible for widespread forest devastation in Mongolia. Surveys undertaken by FAO on wildfires indicate that a total of 4,609 forest and steppe fires occurred in Mongolia during the past 35 years. Between 1980 and 2014, 12 million ha of forest was affected by fire, an average of 343,770 ha per year (figure 13.3). Forests damaged by fire do not regenerate rapidly. After fire, coniferous forests are replaced by pioneer species, such as birch and poplar, and by low quality coniferous forests.

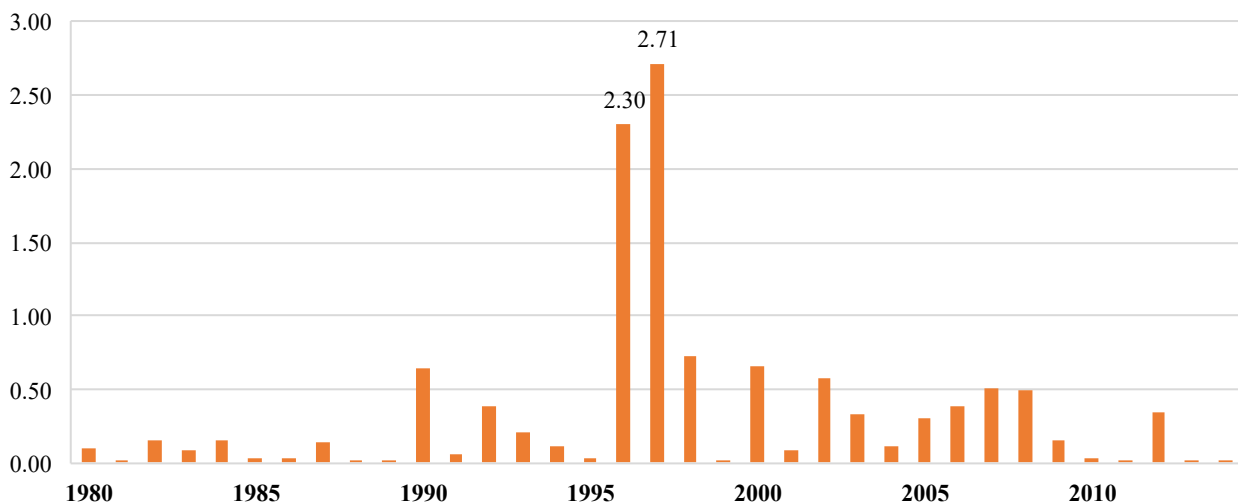
**Table 13.2: Afforestation efforts in the framework of the Green Belt programme, 2005–2017, ha**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Area planted through state budget	307	409	260	265	132.4	106	160	356	106	100	100	50	50	2 401.4
Area planted through foreign investment, of which:														
Green Asia NGO	-	10	-	6	39	47	95	56	-	-	-	-	-	253.0
Republic of Korea – Mongolia Green Belt project	-	-	-	150	100	100	110	200	300	430	500	600	-	2 490.0
Rotary Club	60	42	40	5	-	-	-	-	-	-	-	-	-	147.0
Area planted through other sources		11	-	-	-	-	-	-	-	-	-	-	-	11.0
<b>Total</b>	<b>367</b>	<b>472</b>	<b>300</b>	<b>426</b>	<b>271.4</b>	<b>253</b>	<b>365</b>	<b>612</b>	<b>406</b>	<b>530</b>	<b>600</b>	<b>650</b>	<b>50</b>	<b>5 302.4</b>

Source: Forest Research and Development Centre, Ministry of Environment and Tourism, 2017.

**Table 13.3: Non-timber forest products by type and use**

Type	Forest product	Purpose of use
Botanical NTFPs	Hay	Livestock fodder
	Pine nuts, pine mushrooms	Subsistence and commercial consumption
	Food plants (fruits, berries, herbs, bulbs, vegetables)	Subsistence
	Medicinal plants	Commercial
	Aromatic plants	Religious traditions (incense)
Faunal NTFPs	Furs (sable, martin, wolf, fox and lynx)	Commercial
	Deer antlers	Medicinal purposes, export to People's Republic of China and Republic of Korea
	Marmot oil	Medicinal purposes
	Wild meat	Subsistence

**Photo 13.1: Tree planting to prevent wind erosion****Figure 13.3: Forested areas affected by fire, 1980–2014, million ha**

Source: Ministry of Environment and Tourism, 2017.

Forest fires occur mostly from March to mid-June, immediately after the snowmelt and when the forest litter is drying. Intensive solar radiation rapidly removes moisture from the topsoil and the forest floor becomes very dry and prone to fire. Over 90 per cent

of spring wildfires in Mongolia are human induced and the result of carelessness or arson. Carelessness includes fires started by antler collectors who light fires to cope with the cold weather while collecting antlers in the early spring season, fires caused by the

sparks from vehicle exhaust pipes in remote forests (though very rarely) and, more recently, with the increased promotion of domestic tourism and recreational activities, fires started by people hiking in the forests near urban settlements. In recent years, there has been a notable increase in incidents of arson. Arson is mostly motivated by the current regulatory system, which puts high restrictions on wood harvesting and, in most cases, only allows the harvesting of dead trees. These restrictions have a perverse outcome and fires are used in a criminal way to kill trees with the intention of obtaining a permit to harvest them.

The peak number of forest fires occurred in 1997 (figure 13.3). Winters and springs from 1996 to 1998 were extremely dry and snow falls were very limited in most areas of the country. For two consecutive years, in 1996 and 1997, Mongolia suffered from large-scale forest fires that devastated large parts of the country. In 1996, 2.3 million ha of forest areas were affected by forest fires and in 1997, 2.71 million ha.

### Pests

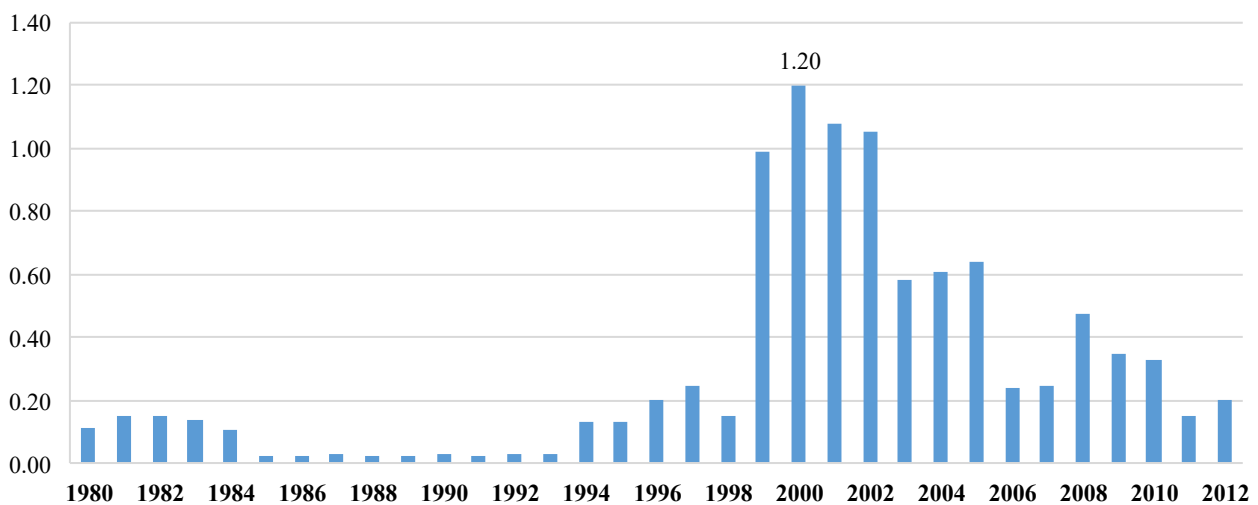
Wildfires, along with other factors such as logging, permafrost thawing and overall climatic conditions, weaken the trees and make them more susceptible to insect infestation. Between 1980 and 2012, 9.9 million ha of forests were affected by pests and insects, an average of 301 ha per year (figure 13.4). Pest outbreaks usually occur approximately every 10–12

years, with increasing intensity; however, in recent years, the drought conditions have contributed to a reduction in time between cyclic outbreaks. The main forest pests include *Dendrolimus sibiricus* (Siberian caterpillar), *Lymantria dispar* (gypsy moth) and *Erannis jacobsoni* (Jacobson's spanworm). Forest pests are not only destroying the trees but they also cause health problems for the local populations, particularly children, who live close to trees, who experience allergic reactions.

Continuous efforts have been applied by the Government to control pest outbreaks, but the vast areas, lack of trained personnel and facilities, financial constraints and poor and outdated equipment, coupled with inadequate coordination and management, make this very difficult to implement. For instance, in 2001, the minimum estimated area needing treatment was 400,000 ha but funds were only available to treat 10,000 ha.

Attempts to control the spread of insects are complex, due to the nature of the terrain and close proximity of some of the infested areas to local habitations. In the outskirts of urban areas, control measures must be tailored around settlements to avoid any spray drift. The high winds and extreme temperatures further complicate control strategies. In addition, the complex life cycle of forest pests makes them very difficult to control. To reduce and avoid the harmful effect of chemical substances use, the Government is making efforts to use environmentally friendly technologies, organic plant-based products and biological methods.

**Figure 13.4: Forested areas affected by pests and insects, 1980–2012, million ha**



Source: Ministry of Environment and Tourism, 2017.

### *Anthropogenic activities*

However, there are a number of factors that have a negative impact on forests. Certain areas of forests are cleared for infrastructure development projects, including road construction and electricity and communication lines, though these are minimal. In recent years, with mining expansion and widespread artisanal mining, some areas of forest have been degraded.

It can be argued that the most significant impact is caused by grazing in forest areas, especially by animals browsing on regenerating vegetation. The number of domestic livestock has significantly increased since the privatization process in the 1990s: rising from 22.6 million head in 1986 to 30 million in 2000, 40 million in 2012, more than 50 million in 2014 and 61.5 million in 2016. This is a dramatic increase that certainly affects forest regeneration, as livestock browse on young seedlings. No study has yet been carried out that looks at the impact of livestock – in particular, certain types of livestock – on different types of forests. Hence, no statistics are available that would allow any conclusion to be drawn on the

economic pressure of grazing on forests.

### *Acid rain*

No data are available on the impact of acid rain on forests. In early 2000, the subject was discussed extensively within the forestry community. Mongolia participates in the Acid Deposition Monitoring Network in East Asia (EANET) (2016 Government Resolution No. 237). In this framework, equipment was installed to measure metal toxicity, and sulphuric and nitrous acid in dry and wet depositions (table 8.1).

### *Logging and illegal logging*

The commercial use of forests in Mongolia started in the 1960s as a result of the country's overall industrialization process. Wood processing industries were established to produce construction materials and domestic products such as gers, furniture and saddles. Timber products were also exported to the People's Republic of China. From the 1960s to the 1990s, the forestry industry was an important sector in the country's centrally planned economy, and contributed to 6 per cent of the GDP.

**Photo 13.2: Grazing in the forest**



In the early 1990s, all wood harvesting and processing enterprises were privatized. However, privatized enterprises were not able to fully operate due to the lack of investment, lack of trained professionals, poor management skills and poor quality standards of products for both domestic and international markets, and, consequently, some of them went into bankruptcy and closed down soon after privatization. As a result, the annual timber harvest fell from 1.8 million m<sup>3</sup> in the 1980s to about 620,000 m<sup>3</sup> in 2002. Another factor in the harvest decline was a government policy to reduce the annual allowable cut as a response to continued forest loss. Some of the forests were also classified as protected areas; thus, the commercial use of forests significantly declined during the last two decades.

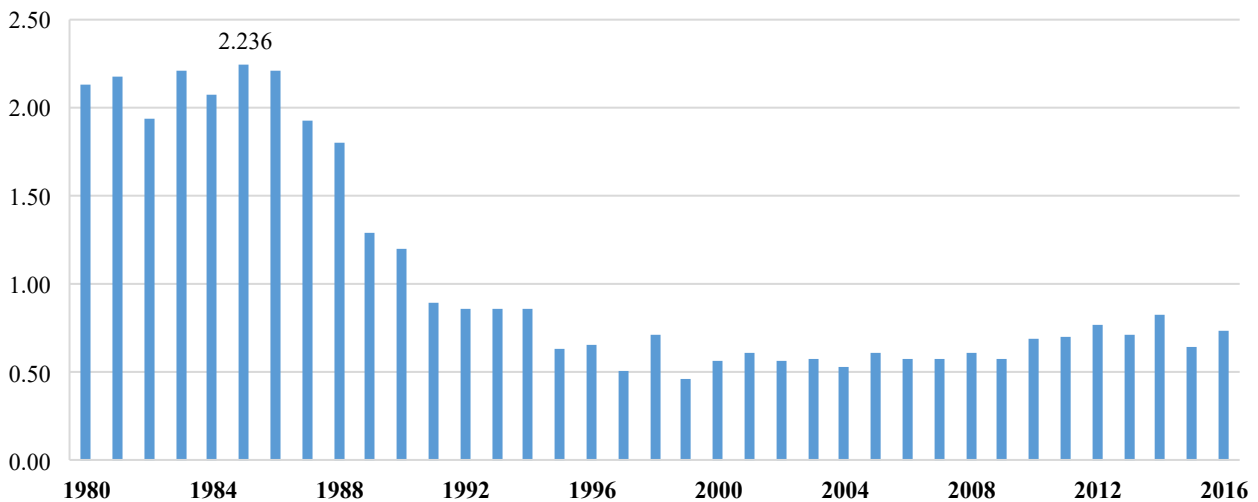
According to the NSO, between 1980 and 2003, in total, 29.2 million m<sup>3</sup> of timber were harvested. Between 1980 and 2016, the total harvested timber amounted to 38.496 million m<sup>3</sup>, an average of 1.040 million m<sup>3</sup> per year (figure 13.5). However, this average cannot be generalized as the trend in timber harvest was different between the decades 1980–1990 and 1991–2000. The average annual timber harvest between 1980 and 1990 was 1.924 million m<sup>3</sup>. However, starting from the early 1990s, the volume of harvested timber has fallen significantly, due to the government policy to reduce timber harvesting as a response to forest degradation. The average volume of harvested timber in the decade 1991–2000 was 0.701 million m<sup>3</sup> and, from 2001 to 2016, the average was 0.665 million m<sup>3</sup>.

Illegal logging remains one of the main problems of forest resource management in Mongolia. The 2003 World Bank report "Forestry Sector Review of Mongolia" estimated that domestic wood

consumption, including sawn wood and fuelwood, varies between 0.965 million m<sup>3</sup> and 3.0 million m<sup>3</sup> per year. The average of 0.663 million m<sup>3</sup> of timber harvested annually would imply that between 0.301 million m<sup>3</sup> and 2.336 million m<sup>3</sup> of timber is harvested illegally each year. This number might be underestimated since the demand and consumption has risen in recent decades, due to the significant expansion of the construction sector, population growth, privatization of land and migration to urban areas.

With the reduction of the annual harvest, rural and urban people suffer a shortage of firewood, which constitutes about 65 per cent of the total wood harvest. Firewood is the only source of fuel for heating and cooking in many parts of the country, due to the absence of electricity and unavailability of coal. In addition, timber is used for construction of fences and houses. Besides their need for timber for subsistence, many people also sell timber occasionally to earn additional income. Some of these people form groups and sell timber in an organized way. Illegal logging is the primary source of income for some of them. Some also possess certain forestry skills, as they are former workers of the wood processing factories. With the collapse of the system and the closure of the wood processing factories, local communities in these previously factory towns have lost opportunities to earn income legally. Furthermore, the Government has not offered any other alternative to timber harvesting for income generation. However, the total volume of illegal timber harvested by such groups is far lower than that harvested by "professional" illegal loggers. According to the World Bank report, such "professional" illegal loggers are companies, which obtain a permit for industrial and fuelwood logging but log in excess of the permitted amount.

**Figure 13.5: Harvested timber, 1980–2016, million m<sup>3</sup>**



Source: National Statistics Office, 2017.

Illegal logging is prominent among violations of environmental laws in terms of its frequency and scale. Between 2009 and 2016, 1,134 illegal logging violations were registered, the highest number among all violations of environmental laws (figure 2.5). In particular, in 2012 and 2013, 262 and 246 violations were recorded.

The Government attempted to respond to illegal logging by strengthening law enforcement. However, human and financial resources are insufficient to prevent illegal logging. On average, a single forest ranger is responsible for the protection and maintenance of up to 100,000 ha of forest. This makes it almost impossible to effectively control illegal activities in the forests. The creation of forest user groups has been effective in preventing illegal logging in forests managed by such groups.

### 13.3 Pressures from forestry activities

In Mongolia, there are no studies on the impact of forestry activities on forests, biodiversity, soils and the health and well-being of local communities.

#### *Unsustainable forest harvesting*

According to UN-REDD's preliminary assessment of the drivers of forest change in Mongolia, the most important drivers of forest degradation are forest fire, minor pest damage and logging. Unsustainable logging is estimated to result in an average of 34,000 ha of degradation per year in the period from 2004 to 2014. The effects of unsustainable logging are made worse by poor logging and post-logging management practices. Enterprises do not appropriately manage to minimize the impacts of fire and subsequent pest damage, nor to restrict accessibility for grazing and additional timber extraction.

#### *Biodiversity and ecosystems*

Poorly managed logging activities contribute to soil erosion and loss of habitat for wildlife and, if left unchecked, they are endangering Mongolia's limited but extremely valuable forest resources. The overall process of deforestation is causing negative impacts on biodiversity and ecosystems. Unsustainable forest harvesting practices can result in habitat fragmentation and the endangering of wildlife species. Therefore, as a preventive measure, clear-cutting is prohibited by the Law on Forests. However, there are neither statistics nor study findings available to enable estimation of the extent of the impact on biodiversity and ecosystems related to forestry activities.

#### *Soil*

Logging operations, such as timber felling and skidding, cause direct impact by reducing vegetation cover and, in many cases, create a precondition for soil erosion. The current technology of site preparation for reforestation by ploughing land may have a negative impact on soils by exposing the permafrost and thus inducing its melting. It is difficult to conclude what changes occur on soils as a result of forestry practices. Since forestry operations remain relatively small in scale, their impact will be rather localized. Sound baseline data are not available to draw any conclusion.

#### *Development and well-being of local communities*

About 40 per cent of the population of Mongolia lives in rural areas. For those who live in forested areas, forests serve as an important source of livelihood and income, subsistence needs, energy supply and employment. Forests also provide opportunities for recreation and tourism.

### 13.4 Types of forest management

All forests of Mongolia are the property of the State. The revised 2012 Law on Forests recognizes three types of forest management: by the Government, by community groups or forest user groups and by private sector entities. The State manages almost 80 per cent of the total forest area.

#### *Forest management by local communities*

Until 1990, the forestry industry developed rapidly and expansively and the forest sector was contributing 6 per cent to GDP. Following the collapse of the socialist system in the 1990s, State-owned wood processing factories have been privatized into small-scale sawmill entities. However, these enterprises soon ceased operations, due to the lack of investment and trained professional workers. Consequently, the domestic market for wooden products has significantly diminished and this has led to extensive illegal logging. The situation has been exacerbated by the overall economic situation in the country, with rampant unemployment caused by the system change. In that context, the main management objective of the State has shifted from utilization to conservation. This policy was also in line with the government objective to include/gazette 30 per cent of the territory under a protected area system (chapter 11). The primary objective was to protect biodiversity and forest landscape, promote recreational tourism and minimize commercial timber harvesting. Reforestation



programmes and forest rehabilitation work have been increased.

However, the Government soon realized that the State-driven, top-down law enforcement system to control illegal logging was ineffective, due to the lack of state finance to support sufficient staff and equipment. Consequently, and to tackle this problem, the Government's response was to engage local communities in forest management, primarily in forest conservation and rehabilitation work. This is based on the approach/understanding that forest-dependent communities that directly benefit from forest resources for their livelihoods and their needs for timber, fuelwood and NTFPs would be the most interested in managing forest resources sustainably and preventing outsiders from using them illegally. This approach required a reform of the forest legislation to allow local communities to obtain long-term forest tenure rights. The 1998 revision of the 1995 Law on Forests provided for the right of individuals, community groups, economic entities and organizations to enter into concession agreements to protect, sustainably use and rehabilitate forest land. Following this change in the policy and legislation, local people have started to create forest user groups. These efforts have been rather successful: in 2017, 18.7 per cent of the forest area in the country is managed by forest user groups (box 13.1).

### *Forest concessions*

The 2007 amendment to the 1995 Law on Forests and subsequent 2009 Government Resolution No. 227 provided a legal basis for private forest concessions. In 2016, 90 private entities are managing 681,400 ha of forests under the concession contracts, which equals to 4.7 per cent of the total forest area. The duration and conditions of the concession contracts for private entities are the same as for forest user groups. The contract is concluded for one year, with possible extension every 10 years up to a total of 60 years. The main objective of private concessions is to support local livelihoods through creation of job opportunities and income generation.

### *Professional forestry organizations*

In addition to the private companies, the Ministry of Environment and Tourism issues "Professional forestry organization" licences/permits to private companies and organizations, following the regulation approved by the 2013 Order of the Minister of Environment and Green Development No. A-223. These private entities are contracted to undertake forest inventories, develop forest management plans, conduct research on forest insects, and conduct pest control, thinning and reforestation activities and industrial logging. As of 2016, 814 private entities were awarded a professional forestry organization licence.

#### **Box 13.1: Forest user groups**

The concession rights are granted to forest user groups by soum or district citizen representative khurals (equivalent to the local parliament), based on a proposal from public meetings of bagh and khoroo citizens (revised 2012 Law on Forests). The concession contract is concluded for an initial period of one year, for the purpose of ensuring adequate preparations, and is subsequently extended every 10 years, for a total period of up to 60 years. However, the security of right holders and legitimacy of contracts are unclear. Only mining concessions enjoy real tenure security. The Law on Forests and other corresponding/relevant laws do not clearly prevent overlapping rights from being granted over a contracted forest area. This sometimes results in situations in which new concessions have been awarded to outsiders over forest areas that are already under the management of forest user groups on a contractual basis.

A forest user group develops a forest management plan, which is approved by the local citizen representative khural. The group reports annually on the implementation of its plan. Since 2015, it is a legal requirement that professional foresters (whether private or government) should assist forest user groups to prepare their forest management plans. For this service, forest user groups have to pay substantial fees, which, in some cases, they cannot afford. It has to be noted that recent and positive attempts have been made and practices have been established by donor-funded projects to simplify forest management plans for forest user groups, to make them workable and manageable for community members. The collection of NTFPs is allowed in the leased forests. However, the collection of fuelwood and harvesting of timber are only allowed through special permits.

As of 2017, 1,281 forest user groups, which include 6,742 households, are managing 3.345 million ha of forests under contract with local authorities. This equals 18.7 per cent of the forest area in the country. Since forest user groups have begun to operate, the number of forest fires has been significantly reduced in the areas managed by them. Forest user groups are initiating forest management activities, including the establishment of forest enterprises. Within a relatively short period, user-group-based forest management has proved itself to be very effective and it has created a sense of ownership among local communities. However, the regulatory framework remains very restrictive. Group members have more obligations on forest protection than they have benefits. Having the status of forest user group does not provide the right to access the financial market. Therefore, the potential of user-group-based forestry in respect of sustainable forest management for economic and ecological benefits is not fully considered.

However, these private companies are beset by many problems. It is a requirement that each professional forestry organization should have at least one professional forester and an adequate number of trained staff. Furthermore, it should possess adequate technical equipment to carry out all necessary operations. However, due to the seasonality of the work, these organizations cannot fully invest in modern technology and equipment and are often obliged to borrow equipment from each other. Some companies continue to hold a licence without having operated for years. Therefore, some companies exist only on paper. Some forest user groups also establish themselves as professional forestry organizations in order to be able to harvest timber.

Hence, the operations of these companies and the quality of their work are not regularly assessed by the Ministry or local governments. For these reasons, the operations of professional forestry organizations should be regularly evaluated with a view to awarding licences only to those companies that have the technical capacity to carry out the job and on the quality of the work that they have delivered. On the other hand, based on their possible future assessment, these companies should be offered training to build their capacities. Furthermore, the number of organizations, 814, is far too high in relation to the overall amount of work that is needed for the entire boreal forest area.

### 13.5 Impact of and adaptation to climate change

#### *Impact of climate change*

The calculations made by GIZ using Landsat satellite images in 2011 show that, between 1999 and 2011, the closed forest area was reduced by 533,100 ha (table 13.4) or 4.1 per cent, which is a forest loss intensity of

0.34 per cent. This reduction includes the loss of 944,300 ha (7.5 per cent) of natural forest area consisting of deciduous, coniferous and saxaul forest, or 73,000 ha (0.62 per cent) annually over that period; however, this is counterbalanced by the increase of 409,300 ha in shrubs and 2,050 ha in planted forests.

The closed forest area has further decreased by 272,900 ha between 2011 and 2016 (data from the forest taxation inventory of the Forest Research and Development Centre). Despite this decrease, the taxation inventory shows that the unstocked forest area has increased, especially areas affected by forest fires and pests. From 1999 to 2011, forest area declined with an increase in the area affected by forest fires by 768,500 ha, logged area by 96,900 ha and area affected by pests by 95,600 ha.

Between 1999 and 2016, the area of shrubs within the forest area increased by 368,300 ha or 87.08 per cent. This is related to permafrost thawing in the taiga, leading to an increase in upper soil moisture, which intensified shrub growth. Especially in narrow valleys characterized by temperature inversion, shrub areas are expanding.

#### *Mitigation measures*

In its 2015 INDC, Mongolia has outlined a series of policies and measures that the country commits to implement up to 2030, in the energy, industry, agriculture and waste sectors. The INDC does not include mitigation measures in the forestry sector. The expected mitigation impact of these policies and measures will be a 14 per cent reduction in total national GHG emissions excluding LULUCF by 2030, compared with the projected emissions under a BAU scenario.

**Table 13.4: Forest area change, 1999, 2011, 2014, 2016, thousand ha**

Type of area	1999	2011	2014	2016	Change 1999-2011 (%)
Closed forest area, of which:	13 086.00	12 552.90	12 174.80	12 280.00	- 4.07
Natural forest	12 670.30	11 726.00	11 388.00	11 500.42	- 7.45
Shrubs	415.60	824.90	784.70	777.49	98.48
Planted forest	0.05	2.10	2.10	2.10	4 100.00
Unstocked forest area, of which:	3 951.30	5 124.70	5 603.00	5 631.08	29.70
Open stand	2 900.40	3 476.70	3 469.30	3 495.34	19.87
Burned out	417.80	1 186.30	1 713.90	1 708.27	183.94
Clearcut area	193.70	124.10	108.60	106.12	- 35.93
Area to be reforested	438.80	221.30	163.70	173.96	- 49.57
Reforested	0.50	9.20	10.80	10.70	1 740.00
Dead from pest attack	-	95.70	135.70	135.78	
Damaged by wind	-	0.90	0.90	0.89	

Source: GIZ, 2011, Forest monitoring in the North Taiga of Mongolia, in Mongolia Second Assessment Report on Climate Change – 2014, 2014. Ministry of Environment and Tourism for 2016 data.

The 2015 State Forest Policy mentions actions for mitigation measures related to the forestry sector that would reduce GHG emissions from deforestation and forest degradation by 2 per cent by 2020 and by 5 per cent by 2030.

#### *Adaptation measures*

The annual mean air temperature over Mongolia has increased by 2.07°C in the period from 1940 to 2014. The 10 warmest of the last 70 years have occurred since 1997. The key impacts on forests were the increased frequency of forest and steppe fires, and the occurrence and intensity of forest insect and pest outbreaks. As a result, the forest area has been reduced by 0.46 per cent annually, and forest resources have been degraded significantly.

As adaptation measures, the INDC suggests to reduce forest degradation by implementing reforestation and sustainable forest management approaches, such as the promotion of community-based forest management practices.

For adaptation needs, INDC suggests to increase the forest area by up to 9 per cent by 2030 through reforestation activities, to reduce forest degradation caused by human activities, and to make forests resilient to climate change by improving their productivity and changing their composition and structure. The same target is included in the SDV 2030. Between 2000 and 2016, the average reforested area has been increased by 7,429 ha annually. Currently, the closed forest area accounts for 12,280,042 ha, or 7.85 per cent of the country's territory. If an increase of 9 per cent of the closed forest area were achieved by 2030, the area would extend to 14,071,950 ha. This means that, in the 14 years from 2017 to 2030, 1,791,908 ha of forest area in total, or 128,000 ha annually, need to be reforested to meet this ambitious objective. Certainly, reforestation is not the only measure to increase the closed forest area – other silviculture measures could be taken to support the natural regeneration. Nevertheless, an annual increase of 128,000 ha of closed forest seems to be unrealistic.

### **13.6 Legal, policy and institutional framework**

#### *Legal framework*

The 1995 Law on Forests provided a basic framework for protection and proper use of forests and promoted regeneration of Mongolia's forests. All forest resources are owned by the State, but the State may grant possession of any part of the forest to aimag (largest administrative unit), soum (smaller

administrative unit within the aimag), and capital city administrations. Citizen representative khurals, which are local parliaments, have the power to grant citizens, economic entities and organizations the right to use forests and NTFPs for certain periods, on the basis of a contract or licence.

The 2007 amendment to the 1995 Law on Forests provided a basis for decentralization of forest management to local governments, making aimag and soum governors responsible for forest management at the local levels. Further, to reduce the burden on local governments, the Law diverts management of forests to public and private entities. It thus provides for granting forest tenure rights to private enterprises and forest user groups. Devolution of forest management to forest user groups is expected to improve the overall quality of many forests, by reducing instances of illegal logging and through improved forest management regulated by formal forest management plans. It was anticipated that forest management activities such as systematic thinning and pruning ("forest cleaning") would enable increased harvests and reduce forest fires and insect infestations.

In 2012, the revised Law on Forests was issued as part of a comprehensive revision of environmental legislation (chapter 1). This allowed the removal of inconsistencies and duplications with other laws. Also in 2012, the 1995 Law on Fees for the Harvesting of Timber and Fuelwood was integrated, along with several other laws regulating various user fees, into the 2012 Law on Fees for Use of Natural Resources.

The purpose of this Law is to regulate relations pertaining to the levying of fees for use of natural resources with citizens, business entities and organizations in relation to the collection and reporting of natural resources, and the amount of funds to be spent on environmental protection and restoration of natural resources from revenues from natural resource use fees. According to the Law, fees are imposed on all types of timber use, i.e. commercial timber and fuelwood and NTFPs. Furthermore, the Law defines that 85 per cent of income from fees for use of forest resources should be allocated for nature conservation and restoration activities (table 13.5).

The 1994 Law on Special Protected Areas specifies forestry-related activities in the different zones of SPAs. For instance, in the StrPAs, only forest maintenance and tending work is allowed in the limited zone. The 1995 Law on Environmental Protection was amended in 2005 to allow citizens to own trees that they have planted on land that is owned by them or under a possession agreement.

**Table 13.5: Minimum mean percentage of fees to be dedicated to environmental protection and natural resource restoration**

Natural resource use fee revenue	%
Natural plant use fee revenues	30
Game resource use payments	50
Land fee revenues	30
Timber and fuelwood harvesting fee revenues	85
Water and springs use fee revenues	35

Source: 2012 Law on Fees for Use of Natural Resources.

The objective of the 2009 Government Resolution No. 227 is to promote collaborative management of forest resources through allocating certain parts of the forest fund to forest user groups, economic entities and organizations, based on the concession/possession agreements. The regulation on possession (annex to the government resolution) specifies procedures for an application for possession and the size of the forest fund to be covered by the agreement.

### *Policy framework*

#### Forest and forestry policy documents

In the forestry sector of Mongolia, the first attempt to develop a long-term policy was made in the 1950s. The policy was mostly concerned with forest production. In 1975, a "general scheme of Mongolian forest utilization management" was prepared with support of experts from the Union of Soviet Socialist Republics (USSR), and remained in place until 1990. The government policy for the period from the 1950s until the 1990s directed the use of forest resources to supply domestic demand and export to the USSR. For that purpose, state forestry enterprises were established, including settlements for workers ("forestry villages"). The volume of timber production, marketing of products and establishment of settlements were strictly planned by the Government.

However, the Government's utilization policy gave little or no consideration to conservation and sustainable forest management during the period 1950–1990. The forestry industry was strongly import dependent for technology, industrial consumables and chemicals, and it was heavily subsidized by the central Government. Techniques and technology used for timber harvesting were unsustainable. Forests were cleared without any restoration and that eventually became a basis for forest deterioration.

In contrast, the 1990s coincided with the recognition of the impact of development on the environment by the international community. After the 1992 Rio

Conference on Environment and Development, the Mongolian Government developed its 1997 State Policy on Ecology, which had considerable influence on forestry. To reflect the need for ecologically sound development, the National Forest Policy (1998 Government Resolution No. 122) was approved in 1998. Of its seven main objectives, three were related to forest utilization and exploitation, three to conservation and protection and one to social welfare. Forest conservation became a more central issue of government policy.

The 1998 National Forest Policy was revised in 2001 as the National Forest Programme (2001 Government Resolution No. 248). This Programme is evidence of the Government's shift from a utilization to a conservation policy. Priority was given to resource management, protection from forest fires and insects, reforestation, institutional restructuring and enhancing the quality of timber processing. Measures to address forest deterioration included the gazetting of more forest areas as SPAs and reduction of the annual allowable cut. This set of measures reflects the strong emphasis placed upon technical solutions, while institutional and social aspects still received little attention.

In May 2015, the State Great Khural adopted the new State Policy on Forests (2015 Resolution of the State Great Khural No. 49), designed for the period until 2030. The new policy takes a comprehensive approach in integrating the country's socioeconomic and environmental issues consistent with the national policies on green development. The State Policy on Forests provides guidance for decision-making on the conservation, use and restoration of forest resources. In terms of main principles, its goals and objectives are very similar to those of previous policy documents on conservation, sustainable use and restoration of resources. Four of the eight objectives deal with forest conservation and the others deal with forest governance, sustainable forest management including use, capacity-building for the prevention of forest fires, pest and diseases, and the promotion of the principle that "users and owners of forest resources are responsible for forest protection and sustainable forest management".

The 2015 State Policy on Forests reinforced approaches such as ensuring multi-stakeholder participation in forest management, creating good forest governance and promoting science/evidence-based forest management. Among the objectives of the policy implementation are some new elements. In particular, the document states that the number of permits for logging will be gradually decreased and the State will favour wood-substitution products.

Furthermore, the Policy states that the country will follow the strategy to meet demand for timber products for industrial purposes from imported sources, while the demand for domestic consumption of wood for individual citizens will be supplied from wood harvested from thinning, cleaning and selective cutting.

The 2015 State Policy on Forests further promotes the creation of agroforestry, expansion of forest infrastructure, establishment of forest plantations with fast-growing species, production of biofuels and pellets, establishment of a national standard for certification of forest organizations by 2020 in line with international standards and enforcement of a system of payment for ecosystem services.

Following the adoption of the 2015 State Policy on Forests, in 2016, the Government approved a medium-term programme for implementing the Policy's objectives for the period 2016–2020. The Policy will be implemented in two phases. The document sets up targets, such as increasing the area of closed forest to 8.3 per cent of total Mongolian territory by 2020 and to 9 per cent by 2030.

#### Other policy documents related to forests and forestry

In 2005, the Government approved the Green Belt National Programme (2005 Government Resolution No. 44), which is still being implemented. The main goal of the Programme is to establish a green belt/forest strip along the Gobi Desert and steppe region in the southern part of the country to slow down the desertification and sand movement. The programme has three stages (2005–2015, 2016–2025 and 2025–2035). The Government has evaluated the results of the first stage. The Ministry and the local governments allocate budget to support the implementation of the Programme. The unit that has been established at the Ministry to organize implementation of the Green Belt National Programme has been dissolved, due to budget constraints in 2012. At the moment, the Forest Policy Coordination Department is responsible for the Programme's implementation. The survival rate of tree plantations is too low, due to insufficient maintenance and remoteness of the areas from settlements, which impedes their regular watering and maintenance. For the next stage, the Government is pursuing a policy to conduct research on the feasibility of developing agroforestry alongside the planted areas and also to link forest strips with the greening efforts of settlements.

The 2014 National Programme on Forest Tending (2014 Government Resolution No. 30) aims to ensure the supply of part of the demand for fuelwood and timber for household purposes by carrying out silvicultural operations. These operations include forest cleaning (removal of dead trees and trees affected by fire and insects) and thinning. In addition, these silvicultural activities are expected to help to protect forests from forest fire and forest infestation. The National Programme does not include the concept of the rational use of residues from forest thinning and tending activities.

#### Forests in the national policy documents on green economy and sustainable development

The forest-related objectives of the 2014 Green Development Policy are:

- Enhance the carbon sequestration in forests by intensifying reforestation efforts and expanding forest cover areas to 9 per cent of the country's territory by 2030;
- Advance community-based natural resource management for the protection and rational use of forests, NTFPs, wildlife and plant resources, and create sustainable financing systems.

The 2016 Action Plan for the Implementation of the Green Development Policy for the period 2016–2030 lists further specific activities through which the above objectives are expected to be met. These include undertaking forest inventory; intensifying afforestation and reforestation; promoting highly productive tree nurseries; limiting the use of timber for household purposes, such as for construction, roads and fences; and improving the legal framework for community-based natural resource management.

The 2016 Mongolia Sustainable Development Vision 2030 includes the target of increasing the forest cover to 8.5 per cent of the country's total territory by 2020, to 8.7 per cent by 2025 and to 9.0 per cent by 2030.

The 2016 Action Plan of the Government of Mongolia for 2016–2020 lists a number of measures that the Government will pursue in forest management for the next four years. One of the five policy pillars, the Policy on Environment and Green Growth, indicates the main directions for forest management, such as promoting sustainable use of forests and NTFPs, production of ecologically friendly products, improvement of forest management for forest rehabilitation and creation of a legal framework for providing financial incentives for individuals, forest user groups, economic entities and organizations for forest plantations.

*Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Targets 15.2 and 15.b is described in box 13.2.



**Box 13.2: Targets 15.2 and 15.b of the 2030 Agenda for Sustainable Development**

**Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

**Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally**

The main principles of the 2015 State Policy on Forests are aligned with the seven thematic elements of sustainable forest management, and include: increase the extent of forest resources; protect biological diversity; improve forest health and vitality; increase productivity; enhance ecological and socioeconomic functions of forest resources; improve the legal, policy and institutional framework; create "good forest governance"; promote evidence-based sustainable use of forest resources; strengthen capacity for forest fire and pest control; and promote the principle of "users should be responsible for conservation".

Mongolia has an ambitious goal to increase the area of closed forest from the current 7.85 per cent of total Mongolian territory to 8.3 per cent by 2020 and 9.0 per cent by 2030. This goal is expected to be achieved through sustainable forest management, in particular, expansive reforestation and afforestation efforts. The Government places priority on reforestation and afforestation activities. Between 1980 and 2016, in total, 195,400 ha were reforested. The Government has been implementing the Green Belt National Programme with the aim of establishing forest strips in the Gobi Desert areas as part of afforestation, and to slow down desertification and sand movement.

The Government has also set the target of establishing a national standard for certification of forest organizations aligned with international standards by 2020. By applying the standard, only certified companies and organizations will be authorized to use forest resources. The Council of Sustainable Forest Management is providing capacity-building training to forestry professional organizations and, upon the successful completion of the training, a national certificate is awarded to the organizations. The Council of Sustainable Forest Management is working closely with the Programme for the Endorsement of Forest Certification (PEFC), to introduce the requirements of the programme as an independent third-party certification.

In order to achieve Target 15.2, which is measured by Indicator 15.2.1 (Progress towards sustainable forest management), Mongolia should consider developing national criteria and indicators of sustainable forest management. The findings and results of the recent Multi-Purpose National Forest Inventory (2014–2016) should serve as a basis for elaboration of future policy directions for sustainable forest management. In addition, Mongolia should consider further refining the system of national certification for sustainable forest management and bring it close to international certification systems, which are appropriate to the Mongolian context and particularly suitable for forest user groups.

**Target 15.b: Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation**

Indicator 15.b.1 is official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems.

Each year, the Ministry of Environment and Tourism approves the budget and plan of afforestation, reforestation and other silvicultural activities. A total of 5.656 billion tugriks were allocated to finance forest management activities in 2015. In 2016, this dropped to 2.828 billion tugriks, due to the overall financial crisis/situation in the country. Table 13.6 shows some of the expenditures dedicated to support reforestation and other forest restoration and silvicultural activities.

Income from fees for utilization of natural resources has increased steadily over the last 10 years. This should be allocated for financing activities for environmental protection and natural resource management. However, the Minister's package for environmental expenditure has been reduced gradually in recent years.

The Government should make efforts to further increase funding for financing forestry activities. The forestry sector's contributions are highly relevant in supporting rural livelihoods, through informal employment and subsistence income from NTFPs and widespread distribution of such benefits. In addition to generating income, forests in Mongolia provide essential ecosystem services that support agriculture by regulating water flows, stabilizing soils, maintaining soil fertility and regulating the climate. Therefore, the financing for forest conservation and management should not be regarded as solely "forestry" activities but, rather, considered in a much wider context, and has to be seen as an important contribution to socioeconomic development.

**Table 13.6: National expenditures to support reforestation and other forest restoration and silvicultural activities, 2015–2016, billion tugriks**

Activities	2015	2016
Reforestation	0.626	0.330 for 440 ha
Afforestation	0.200	0.100 for 50 ha
Support seed production	0.085	0.053
Forest management plan	0.302	0.218
Forest fire prevention	0.221	0.130
Forest pest prevention	3.076	0.420
Support capacity-building for forest user groups	0.08	0.220
Forest tending, combating illegal logging	0.508	0.544
Others	3.634	0.813
<b>Total</b>	<b>5.656</b>	<b>2.828</b>

Source: Ministry of Environment and Tourism, 2017.

### *Institutional framework*

#### Governmental institutions responsible for forests and forestry management

The Ministry of Forestry and Wood Industry was established in 1972 with the overall responsibility for forest resource management, implementation of forest legislation, estimation of the annual allowable cut, allocation of forest land for timber harvesting, controlling and monitoring of wood processing industries, planning of reforestation work and silviculture activities. The formation of a ministry to administer forestry-related issues was a responsive measure by the Government, as the wood industry employed over 20,000 people, accounted for 18 per cent of industrial production and contributed 6 per cent of GDP. All aimags and the capital city had forest offices with hunting units. Timber harvesting and processing enterprises were affiliated to the Ministry. From the 1970s, the forestry sector had started benefiting from trained professional foresters and engineers.

In 1987, a major change occurred in the forestry sector. The areas of work on forest harvesting and wood processing moved to the Ministry of Industry and, in 1992, to the Ministry of Trade, following the government restructuring. Simultaneously, the functions of forest protection, reforestation and forest resource management shifted to the Department of Forests and Wildlife of the Ministry of Nature and Environmental Protection, which was established in 1987. In 1990, the Ministry was merged with other agencies to form a new State Committee for Environmental Protection. In 1992, the Committee was reorganized into a new Ministry of Nature and Environment. Until 2004, forestry-related management and administration was dealt with by a department in the Ministry, either as a stand-alone

forestry department or merged with other natural resources issues.

In 2004, the department in charge of forestry became a Nature, Forest and Water Resources Agency, which was established with the responsibility to undertake policy implementation on forest conservation, rehabilitation (reforestation and afforestation) and use of NTFPs. This reorganization was a good attempt by the Government to prioritize forestry issues on the national agenda. However, due to the budget deficit, the Agency was dissolved in 2010 and forestry was integrated back into the Ministry's structure. As of 2017, the Forest Policy Coordination Department is one of the nine departments in the Ministry of Environment and Tourism (figure 1.2).

The main responsibilities of the Forest Policy Coordination Department include the formulation and implementation of forest policy, programmes and legislation, coordination of the implementation work, provision of technical and methodological guidance and advisory services and development of proposals to improve forest management. More specifically, the Department is in charge of coordination of the forest inventory and research, reforestation and afforestation, forest insect and pest control, combating illegal logging, forest maintenance, sustainable forest management, forest products and strengthening "forest governance".

The Forest Research and Development Centre is a national body that operates directly under the Ministry of Environment and Tourism and is responsible for forest inventory and research.

There are several institutions managing forest resources at the subnational level. The Ministry of Environment and Tourism establishes the annual allowable cut based on a forest resources inventory,

but the issue of permits and licences for use is the responsibility of aimag and soum governors.

#### Other institutions

With regard to the implementation and enforcement of the forest legislation, the responsibility was initially under the Forest and Wildlife Department (1987–1990), then under the Agency of Forest and Plant Resources (1991–1996), and subsequently under the Forest and Wildlife Bureau of the Agency of Environmental Protection and Department of Natural Resources of the Ministry of Nature and Environment (1997–2003).

In 2003, GASI was established and environmental law enforcement functions, including the enforcement of forest legislation, was transferred to it (chapter 2). GASI has environmental inspectors at the aimag level. At the soum level, environmental enforcement is the responsibility of environmental inspectors appointed by the soum governors, and of rangers.

NEMA mobilizes its resources in the event of forest fire. In total, 3,200 emergency personnel (rescuers and firefighters) nationwide working in local emergency management divisions or departments are deployed for firefighting.

#### Coordination among institutions responsible for forest management at national and subnational levels

The multilevel government institutions and their forestry-related responsibilities are depicted in table 13.7. The Ministry of Environment and Tourism provides technical and methodological guidance to forest units in aimags, which are part of the environment and tourism departments of the aimag administrations. However, forest units at the aimag level receive funding for their operational activities from the environmental fund of the aimag governor. This fund is generated from revenues from fees for use of natural resources. Following the 2000 Law on Reinvestment of Natural Resource Use Fees for the Protection of the Environment and the Restoration of Natural Resources (no longer valid) and in accordance with the amended 2012 Law on Fees for Use of Natural Resources and the 2014 Government Resolution No. 43 on regulation on revenue generation, expenditures and reporting on nature protection and rehabilitation measures, the part of fee revenues for using natural resources such as water and mineral water, timber and fuelwood harvesting, game

resources and flora serves as a source of budgetary funding for protection of the environment and sustainable management of natural resources. The minimum amount to be spent on an annual basis is established by the Law. Fee revenue from timber and fuelwood harvesting should constitute a major portion of the total funding for environmental protection (table 13.5).

The forest industry (including technological aspects of wood harvesting) is the responsibility of the Ministry of Food, Agriculture and Light Industry.

Forest units at the aimag level report to the aimag governor and the Ministry of Environment and Tourism. Intersoum forest units were established following the 2012 Government Resolution No. 255; 36 intersoum forest units are currently operating in six forested aimags. Aimag forest units provide technical guidance to the intersoum forest units. However, intersoum units report to the soum governor (figure 13.6). Intersoum forest units monitor the implementation of forest management plans of forest user groups and of forest professional organizations. Intersoum forest units are responsible for large forest areas. According to Government Resolution No. 255 and its Annex on Approval of Norms, Standards and Location of Forested Areas under the Responsibility of Intersoum Forest Units, some of the intersoum units are responsible for more than 1 million ha of forest. Assessments done by FAO and GIZ have revealed that the units are understaffed, and their staff do not possess the required qualifications or undertake regular capacity-building training. Furthermore, the units do not have the necessary equipment to carry out their everyday work.

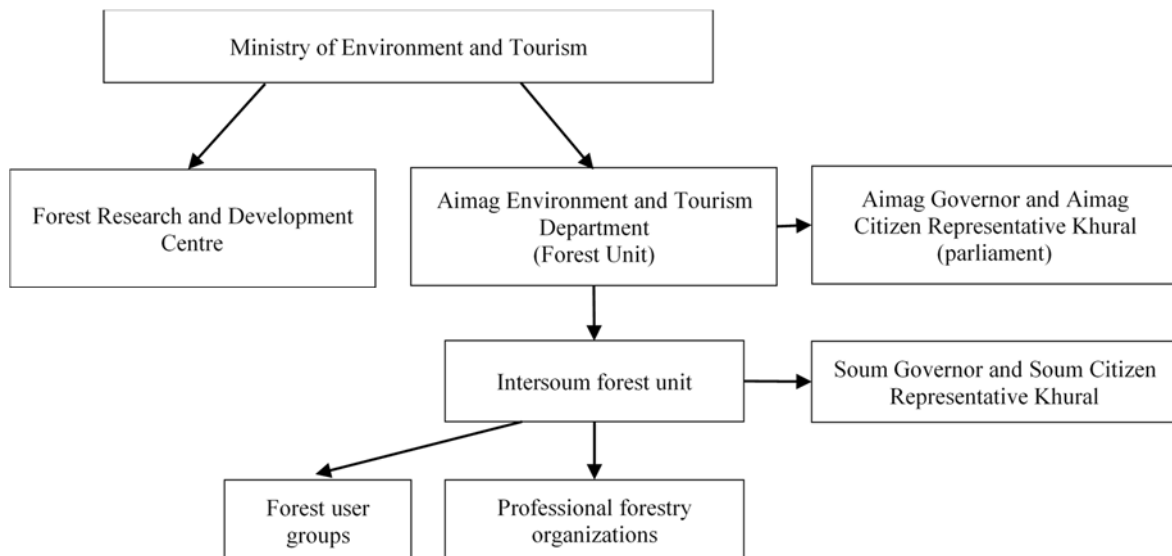
#### *Economic and information measures*

In 2010, the Government passed Regulation No. 59 with the aim to provide financial incentives to legal entities (citizens, economic entities, forest user groups and organizations) for action that reduces harmful impact on forests, for the introduction of new technologies to prevent harmful forestry practices, and for the protection, sustainable use and rehabilitation of forest resources. The eligibility criteria for accessing these incentives apply to three areas: technology aimed at improving forest health, stock and production; technology aimed at improving forest products processing; and environmental awareness and education. However, there is no data on the amount that was paid by the Government in incentives.



**Table 13.7: Institutional framework for forest management**

Level	Government institution	Responsibilities
National	Ministry of Environment and Tourism	Provide strategic direction, policies and principles and develop regulations for forest resource management; Establish technical limits of annual allowable cut based on proposals from aimags; Allocate fund for reforestation to the aimags' environment and tourism departments, and fund for seed and seedlings preparation, forest research activities, forest fire and insect control, control of illegal logging, capacity-building for forest user groups and intersoum forest units and monitoring activities through the Forest Research and Development Centre; Approve aimags and capital city forest management plans; Define the size of area and allocate fund for thinning work to the intersoum forestry units.
	Forest Research and Development Centre	Carry out national forest inventory; Conduct forestry research; Identify seed trees and shrubs to develop a seed bank; Maintain forest information database; Designate forest areas for logging, tending and thinning; Develop and revise norms and standards for reforestation; Provide professional guidance and methodological support to forestry units, forest user groups and forest enterprises; Monitor pest management (prevention and control measures).
Aimag	Citizen representative khural	Approve programme, action plan and budget for forest protection, sustainable use, rehabilitation, tree nurseries and forest fire prevention.
	Governor's Office	Organize tenders to select private entities to undertake reforestation and rehabilitation work; Distribute annual harvesting quotas to soums; Report to the Ministry of Environment and Tourism on the status of the forest land; Submit proposals from the aimag on the volume of annual harvesting to the Ministry of Environment and Tourism; Approve soum forest management plans.
	Environment and tourism departments (forest units)	Collect proposals for annual cut from soums and present them to the aimag governor; Provide technical and methodological support to intersoum forest units; Make agreements with intersoum forest units; Report to the Ministry of Environment and Tourism and aimag governor.
Soum	Citizen representative khural and governor	Approve budget for forest protection, sustainable use, rehabilitation, tree nurseries and forest fire prevention at soum level; Estimate volume for annual cut.
	Intersoum forest unit	Designate areas for logging and thinning; Monitor implementation of forest management plans developed by forest user groups and forest enterprises; Undertake forest fire prevention measures and mobilize local population in forest fire suppression.

**Figure 13.6: Institutions and organizations in the forestry sector**

In recent years, the Government has increasingly sought the involvement of communities, citizens and the private sector in the establishment of tree plantations, and is using direct and indirect incentives to that effect. Incentive systems for tree planting are an important instrument to encourage landowners<sup>16</sup> to engage in the tree planting business. The 2014 Joint Order of the Minister of Environment, Green Development and Tourism and the Minister of Finance No. A-140/63 provides a framework for incentives for tree planting by citizens, forest user groups, economic entities and other organizations. The main objective of the regulation is to award cash incentives to these legal entities for the preparation of good quality seedlings and saplings in their nurseries at their own cost.

In addition, this regulation has provisions to provide incentives for legal entities to be awarded cash for having prevented the spread of forest fire and insect infestation at their own cost. These actions may include the construction of firebreaks and forest fire detection and suppression measures. Legal entities are rewarded with cash when the number of fire occurrences has been decreased and the damage from forest fires on human life, properties and the ecosystem has been reduced. Cash rewards are also awarded to those entities that have combatted forest insect infestation at their own cost and using environmentally friendly technologies and methods.

To encourage reforestation and tree planting in the country beyond the reforestation requirements, the revised 2012 Law on Forests also provides an incentive for persons to "own" trees they have planted on land leased by them. This is an innovative approach, which should promote the sense of ownership among citizens and motivate them to plant trees. However, the legal basis for this approach is not clear. Forests are State owned and, therefore, privately planted trees, constituting a forest, are state property and the granting of ownership over them requires some clarification.

#### Forest inventories

The first assessment of forest area and forest resources was done in the 1950s. The first and second national forest inventories were carried out over the periods 1956–1958 and 1974–1975 respectively. The former resulted in the development of the Mongolian extension map and the corresponding comprehensive dataset of forest characteristics. The latter updated the

previous assessment and was elaborated based on the outcomes of the first Master Plan (1975–1990) for Utilization of Forest Resources in Mongolia. Between 1976 and 1988, further assessment was carried out on potential timber resources in the production forests for 16 wood-harvesting enterprises, established in accordance with the Master Plan.

Since the 1990s, subnational forest inventories are carried out at aimag level on a continuing basis at 10-year intervals, pursuant to the Law on Forests. Taxation inventories collect information on forest resources, such as forest area, volume, quality, condition, average tree height, diameter and age, regeneration and logging, which serve as the basis for forest management planning.

#### Multi-Purpose National Forest Inventory

The Multi-Purpose National Forest Inventory (NFI) 2014–2016 is the first national-level forest inventory, which was conducted by the Forest Research and Development Centre in collaboration with the main forestry institutions, university and research organizations, as well as international organizations. It is called multi-purpose since it covers multiple characteristics and functions of boreal forest, as well as being compatible with the international reporting requirements for REDD+.

The main objective of the NFI was to produce reliable and accurate information on Mongolia's forest resources, develop silvicultural guidelines and improve forest planning procedures in order to support evidence-based national forest policy development. The first phase, covering stocked boreal forests, was implemented from 2014 to 2016. The geographic distribution and extent of Mongolia's stocked boreal forests were assessed through modern remote sensing surveys. The findings from the NFI are based on measurements of 251,890 trees and 166,830 young trees in the regeneration category and other field inventory data from 4,211 sampling units. The main findings of the NFI are that forests in Mongolia are overaged, underutilized and understocked.

#### National Tree Planting Day

In 2010, National Tree Planting Day was introduced (2010 Decree of the President No. 63) to encourage every citizen to participate in tree planting. About 2.21 million trees were planted by the population in 2012

<sup>16</sup> Citizens who own 0.07 ha of land (in Mongolia, every citizen can own 0.07 ha of land for household purposes only).

as a result of this initiative, followed by 1.17 million trees in 2013 and 1.43 million trees in 2014.

#### *Participation in international agreements and processes*

Mongolia is a party to the Convention on Biological Diversity (CBD) (chapter 7), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (chapter 6) and Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) (chapter 7).

Mongolia has submitted forest resource assessment reports in 2005, 2010 and 2015 under the FAO's Global Forest Resource Assessment.

Since its establishment in 2000, Mongolia has been a member of the United Nations Forum on Forests (UNFF), which has the objective to promote the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end. Mongolia has designated its focal point to this process. Mongolia would have the opportunity to review the State Policy on Forests and the results of the situation assessments as a pilot country on implementing the United Nations Forest Instrument, formally known as the Non-Legally Binding Instrument on All Types of Forests. The pilot project is expected to help Mongolia identify weaknesses and areas to be strengthened in the State Policy on Forests.

#### *International projects*

The main international donors in the forestry sector have been Germany, Japan, the Netherlands and the Republic of Korea. Technical assistance has been provided by such international organizations as FAO, UNDP, the World Bank and the ADB. Foreign assistance started in mid-1990 with small-scale projects on reforestation and forest fire prevention, and the outcomes of these projects provided a good basis on which to formulate technical cooperation projects. In early 2000, projects on forest fire management have been implemented by FAO and GIZ. Following these projects, foreign assistance has shifted to support community-based forest management.

### **13.7 Assessment, conclusions and recommendations**

#### *Assessment*

Until 1990, the forest industry developed rapidly and expansively and the forest sector was contributing 6 per cent of GDP. With the collapse of the system in the 1990s, State-owned wood processing factories were privatized and subsequently ceased their operations, due to a lack of investment and trained professional workers. Consequently, the domestic market for wood products has declined significantly and this has led to extensive illegal logging. The situation has been exacerbated by the overall economic situation in the country, with rampant unemployment caused by the system change. In that context, the main management objective of the State has shifted from forest utilization to conservation.

Starting from the early 1990s, the Government has developed a comprehensive legal, policy and institutional framework for forest resource management. More recently, the 2015 State Policy on Forests has set the main objectives. Four of its eight objectives deal with forest conservation. Therefore, forest conservation remains the priority for the country, aiming to reduce timber harvesting, include as many forest areas as possible in protected areas and conduct reforestation. However, this policy fails to reflect the forest condition, as recently revealed by the Multi-Purpose National Forest Inventory (2014–2016), and the domestic need for timber and fuelwood. The results of the Inventory require a policy response to develop active forest management in the country.

Another priority area in forest policy is afforestation and reforestation. Most of the government funding in the forestry sector is allocated for tree planting and pest control. The government-funded Green Belt National Programme is the main example of major funding from the state budget to promote afforestation. However, the success and survival rate of the reforestation and afforestation practices are not carefully evaluated and reflected in long-term policy.

Mongolia has made significant progress towards developing participatory forest management. The promotion of this concept is a government response to tackle the problem of illegal logging and provide better control of forest fires. The rationale behind this concept is that forest-dependent communities that directly benefit from forest resources for their livelihood, needs for timber, fuelwood and NTFPs would be the most interested in managing forest resources sustainably and preventing outsiders from using them illegally. However, despite recent positive

developments with the adoption of the 2015 State Policy on Forests, forest user groups are still not regarded as key players in the sustainable management of the country's forests. Currently, the focus of involvement of the local population is more on protection than on actual management and resource use. The absence of legal status and security of tenure rights may lead to community demotivation and is likely to undermine community participation in forest management in the long run. Unless local people see tangible and significant benefits in improvement of their livelihoods, their participation and further engagement will be difficult to sustain.

### *Conclusions and recommendations*

#### Sustainable forest management

The findings and results of the recently released Multi-Purpose National Forest Inventory (2014–2016) are a good basis for elaboration of future policy directions to achieve sustainable forest management in line with Target 15.2 of the 2030 Agenda for Sustainable Development. The Multi-Purpose National Forest Inventory has revealed that Mongolian boreal forests are largely overmature. Consequently, forests are not only less productive but also more prone to fires and pest attacks and less resilient to climate change. The result is forest degradation and, ultimately, deforestation. More active forest management of mature and overmature stands, which would not only improve overall forest condition but also create jobs and income in rural areas, is lacking. Mongolia also lacks national criteria and indicators of sustainable forest management, which are important for it to be able to measure progress towards Target 15.2. The country is working on the system of national certification, which is another tool for advancing sustainable forest management.

#### Recommendation 13.1:

*The Ministry of Environment and Tourism should:*

- (a) *Revise the 2015 State Policy on Forests in light of the findings of the Multi-Purpose National Forest Inventory (2014–2016) to reflect the need for increasing the management and sustainable use of forest resources and to ensure evidence-based policy development;*
- (b) *Develop national criteria and indicators of sustainable forest management;*
- (c) *Develop a system of national certification for sustainable forest management and bring it closer to international certification systems such as the Programme for the Endorsement of Forest Certification (PEFC).*

#### Forestry institutions

Mongolia has a comprehensive legal and policy framework for forest management. However, the institutional set-up that would support the implementation of forest policy, in particular at the local level, is not sufficiently strong. The establishment of intersoum forest units, which started in 2012, is a good attempt to devolve considerable management responsibility to local levels. However, these units do not have the necessary equipment and resources to carry out their everyday work. They are understaffed and their staff do not possess the required qualifications. Forestry professional organizations also operate at the local level. As of 2016, 814 private entities were licensed as professional forestry organizations. However, these private companies are beset by many problems, such as a lack of trained staff, technical equipment and access to modern technologies. The quality of their work is not regularly assessed by the Ministry of Environment and Tourism or local governments.

#### Recommendation 13.2:

*In order to strengthen forestry institutions at the local level, the Ministry of Environment and Tourism should:*

- (a) *Strengthen operations of the intersoum forest units through provision of equipment and training;*
- (b) *Monitor the work of licensed professional forestry organizations and ensure that licences are issued/renewed to qualified organizations only.*

#### Participatory forest management

Mongolia has made a significant progress towards developing participatory forest management. However, the legal status of forest user groups is still unclear. Forest user groups cannot be awarded any logging permits. Therefore, they have to enter into partnerships with private enterprises and forestry professional organizations to obtain logging permits. Furthermore, due to their not having any legal status, they do not have access to financial services.

The revised 2012 Law on Forests provides concession rights to forest user groups for up to 60 years. Forest user groups enter into an agreement with the soum governor. However, the security of right holders and the legal status of their contracts are unclear and weak. Only mining concessions enjoy real tenure security. The Law on Forests and other relevant laws do not clearly prevent overlapping rights from being granted over a contracted forest area. This sometimes results

in situations in which new concessions have been awarded to outsiders over forest that is already under the management of forest user groups on a contractual basis.

Recommendation 13.3:

*The Ministry of Environment and Tourism should develop proposals to amend the legislation in order to:*

- (a) *Formalize the status of forest user groups to provide them with the legal rights to use forest resources sustainably;*
- (b) *Ensure that forests under the management of forest user groups are not affected by mining or petroleum licences.*

Information for future decision-making

Recent statistics and the State of the Environment Report for 2015–2016 demonstrate that the condition of forests managed by forest user groups has improved, in particular, by preventing the occurrence of forest fires. Local communities have developed a sense of ownership over their resources. However, there is no information on the extent to which the management of forests by forest user groups has impacted on deforestation and forest degradation, and management of NTFPs, wildlife and plant resources, and has enhanced carbon sequestration. Such information is important for further developing community-based forest management.

Recommendation 13.4:

*The Ministry of Environment and Tourism should conduct a study on the impact of active forest management and use by forest user groups to address its impact on deforestation and forest degradation and the resulting carbon benefits through increased stand increment and avoidance of forest fires and other causes of forest degradation, with the support of spatial tools.*

Biofuel production and local livelihoods

The natural forests of Mongolia are in great need of tending and thinning to ensure healthy forest stands, increased growth and resilience to climate change. However, there is no concept on the rational use of residues from forest thinning and tending activities that could meet the costs of these operations and generate income to support local livelihoods. Few innovative trials have been tested by forestry projects that also include activities carried out by forest user groups.

Recommendation 13.5:

*The Ministry of Environment and Tourism, with relevant stakeholders, should:*

- (a) *Conduct an economic and sustainability analysis on the possibility of using residues from thinning and tending operations to produce biofuels such as chips, briquettes, pellets and charcoal;*
- (b) *Develop a comprehensive approach to promote biofuel production, using wood residues, tending and thinning products, for power generation, by building efficient wood-fired power plants and boilers at soum centres and briquetting for the Ulaanbaatar fuel market;*
- (c) *Develop a concept for supporting small-scale forest enterprises based on forest user groups to create green jobs, provide sustainable wood supply for domestic consumption, heating and cooking and to improve local livelihoods.*

Funding

Currently, most of the government funding in the forestry sector is allocated to tree planting (reforestation and afforestation) and pest control. However, the success of tree planting activities is rather questionable. In addition to the harsh climate, several factors affect the low survival rate of trees, such as cattle grazing, forest fires and the quality of plantation operation. Ways to increase the effectiveness of tree planting efforts are to be explored in view of the Government's goal to increase the area of closed forest from the current 7.85 per cent to 8.3 per cent by 2020 and 9.0 per cent by 2030. The funding currently provided to the forestry sector is not sufficient to support more effective forest management with consideration of the potential of forestry to support rural livelihoods. Efforts to mobilize additional funding for these purposes would be in line with the Government's commitment under Target 15.b of the 2030 Agenda for Sustainable Development.

Recommendation 13.6:

*The Government should:*

- (a) *Conduct an analysis to evaluate the effectiveness of reforestation and afforestation efforts;*
- (b) *Make efforts to increase funding for more effective forest management with a consideration of the potential of forestry to support rural livelihoods and create green jobs.*

## Chapter 14

# RISK MANAGEMENT OF NATURAL AND TECHNOLOGICAL/ANTHROPOGENIC HAZARDS

### 14.1 Current situation

Combined social, economic and geophysical features define the disaster hazards and disaster risk management (DRM) landscape that Mongolia is facing today.

Mongolia is a landlocked country exhibiting considerable diversity in landscape and geophysical conditions, and frequent temperature extremes. Nearly 70 per cent of the population resides in urban areas, with about 1.2 million people, or 40 per cent of the population, in the capital area of Ulaanbaatar. There are nearly 1 million more people who are dependent on the natural environment as they move with their herds as pastoralists.

Due to the precariousness of climatic conditions and traditional economic structures, natural disasters, especially disasters of meteorological and hydrological origin, have substantial effects on socioeconomic conditions in the country. Heavy rains, snowfall, strong winds, sandstorms, snowstorms, hail and flooding often result in significant damage to life and property in Mongolia. Devastating weather hazards such as dzud and drought are a well-known affliction of the Mongolian nomadic herder. Dzud is the Mongolian term for an extraordinarily harsh winter that deprives livestock of grazing – a specific phenomenon – that takes its toll in the winter–spring season when high numbers of livestock die of starvation. Droughts, floods (in urban and rural areas), steppe and forest wildfire, storms and agricultural vermin are other hazards that combine climatic effects, changing environmental conditions and increasingly challenging economic conditions to characterize a perilous hazardscape in Mongolia. There is a clear indication that the frequency and magnitude of natural disasters are increasing, due to global climate change.

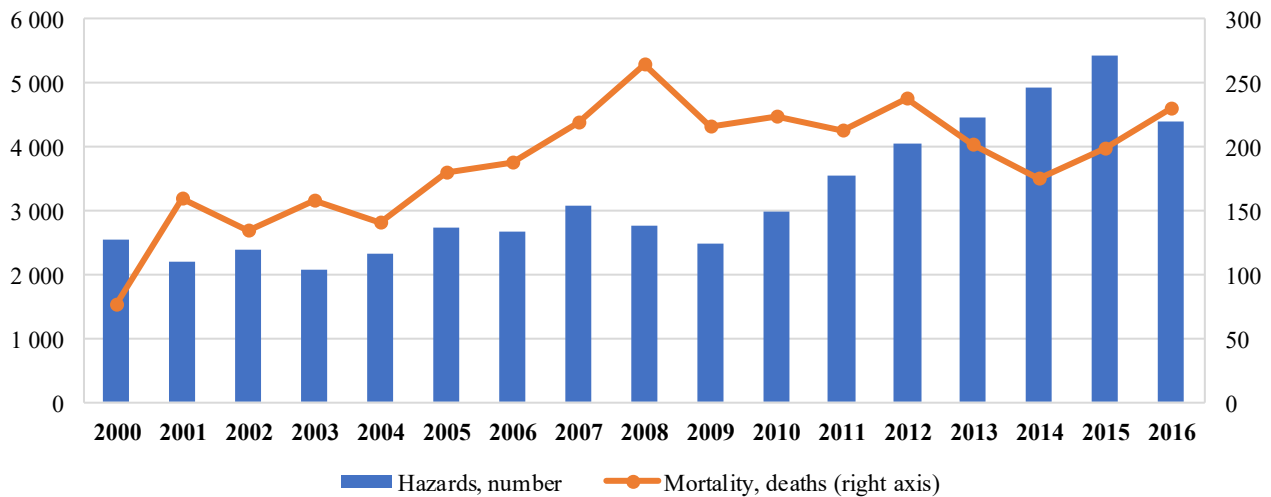
These natural hazards have different consequences that affect various parts of the country and different segments of the population. They all pose recurrent threats and represent potentially costly consequences, which are not likely to lessen in the coming years. Furthermore, much of the country's landscape and

natural resources of land and water are fragile and are particularly subject to progressive degradation or reduced availability.

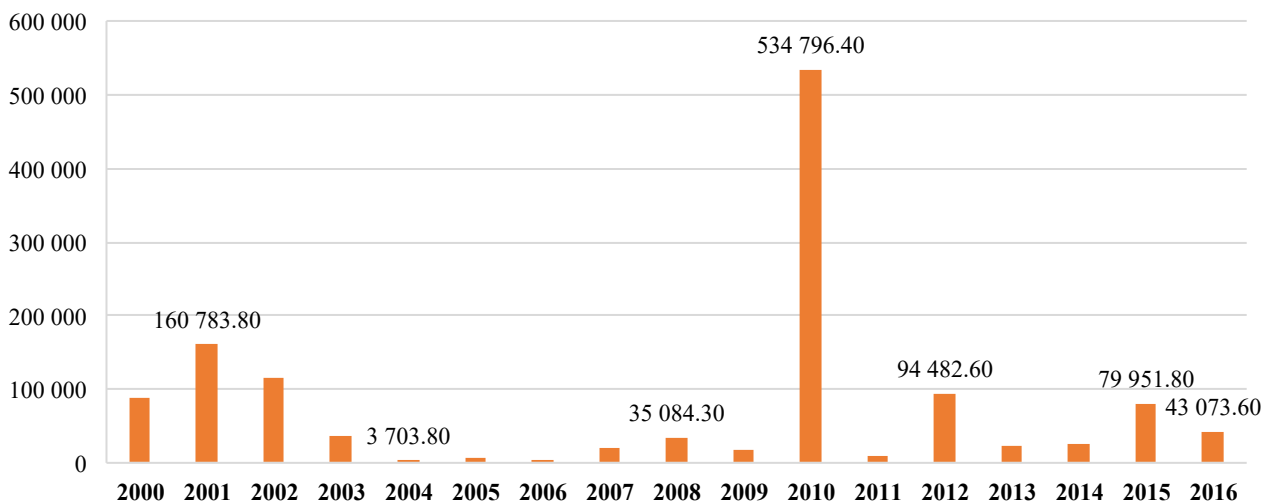
Much of the built environment of major urban areas is dated or of varying physical condition or seismic resilience. A rapid increase in urban migration and growth of the informal or underserved ger districts around the perimeter of Ulaanbaatar now account for 60 per cent of the city's population. Besides creating new and unmanaged risks, the ger districts also exert additional pressure on physical environments and require much more urban infrastructure, which remains unmet. The combination of the harsh and demanding physical environment, rapidly changing economic opportunities identified with urban or commercial activities and altered social conditions between rural and urban habitation will only intensify future drivers of risk in Mongolia.

There are additional emerging or "slow-onset" risks to people's livelihoods, which can affect the land and natural resources of the country. The recent increase of large mining operations, with their possible threat of depleting water resources in already arid or environmentally fragile areas of the country, has become a serious concern.

In the period 2000–2016, approximately 3,200 natural and human-induced hazards occurred each year, causing about 190 fatalities annually. Over 90 per cent of the total number of reported disaster events were building fires and forest and steppe fires, the remaining 10 per cent being caused by other natural and human-induced hazards. The number, occurrence, frequency and severity, as well as the impact, of natural and technological/ anthropogenic hazards in Mongolia in the period 2000–2016 increased (figure 14.1). The average economic loss caused from natural and technological hazards in that period amounted to 76.0 billion tugriks per year (figure 14.2). In 2010, the economic losses of 534,796.4 million tugriks amounted to 5.5 per cent of GDP, at 2010 constant prices.

**Figure 14.1: Natural and technological hazards and related mortality rate, 2000–2016**

Source: Disaster Research Institute, 2017.

**Figure 14.2: Economic losses from natural and technological hazards, 2000–2016, million tugriks**

Source: Disaster Research Institute, 2017.

### *Climate change and its impact*

Over the period 1940–2013, the average annual air temperature of Mongolia increased by 2.07°C, which is three times the global average increase. The number of warm days has increased by 16–25 days since 1961, the annual total precipitation level has decreased by 9.4 per cent and, in summer, heavy rains increased while drizzling rains decreased.

The permafrost layer has deteriorated and a number of rivers, brooks, springs, oases, lakes and ponds have dried up. The diversity of rangeland grasses has decreased by 2–3 times and 78.2 per cent of the grassland has been affected by moderate and high levels of desertification. In addition, the crop growth

rate has reduced by 20–30 per cent over the entire territory.

The numbers, types and frequencies of natural and climatic hazards, including droughts, dzuds, thunderstorms, heavy rains, dust and snowstorms, hails and flash floods, have increased during the last 20 years, doubling the extent of social and economic damage and losses compared with previous years. The annual mean air temperature is predicted to increase by a further 2.1–3°C by 2050. Therefore, it is anticipated that damage to human lives and health, animal and livestock loss, and damage to properties and the environment are likely to increase in the future.

### Natural disasters

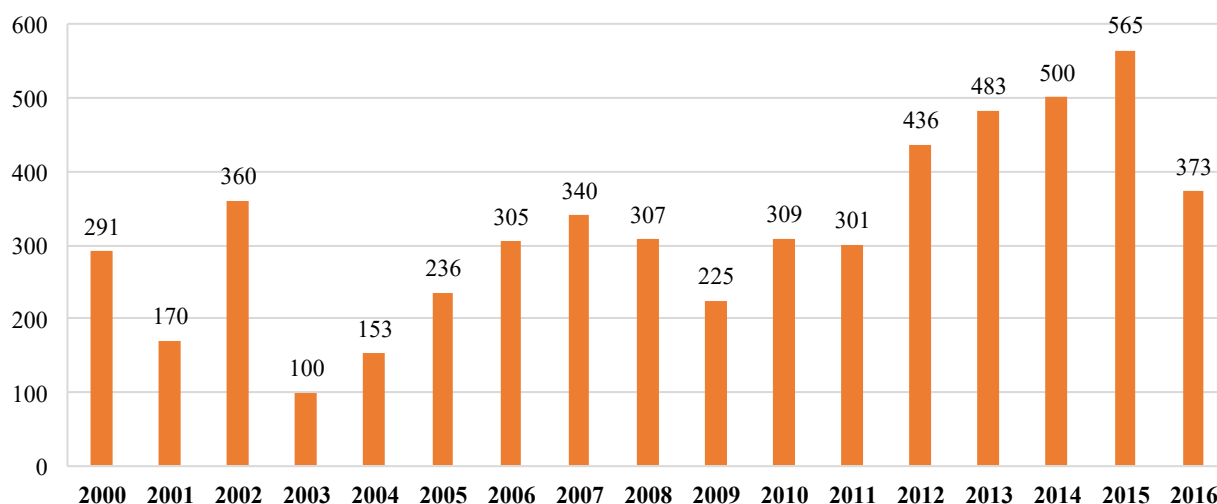
The most common and most devastating disasters derive from natural hazards (figure 14.3).

#### Dzud

A dzud is a complex meteorological natural disaster in which a dry summer is followed by a winter with abnormally low temperatures and high winds. The dry summer means that livestock have not grazed sufficiently, so they are underweight and less resilient to the harsh winter weather. Dzuds can lead to economic crisis and food security issues because of the overwhelming loss of livestock. Dzuds come in various forms and types (table 14.1).

With losses of about 25 per cent of the national herd in the 2009–2010 dzud, many herders' livelihoods were threatened. This led to increased migration off the land to the rapidly growing urban areas. The harsh winter of 2015–2016 severely affected 41 per cent of Mongolia's total herder population (225,788 people). Among these, 11,800 households with fewer than 100 animals were considered most vulnerable. Herders suffered from a range of factors, including lack of access to basic services, food insecurity, loss of livelihood and psychological trauma. According to the Mongolian Dzud Response and Preparedness Plan (April 2016), of the 55,975 million livestock in Mongolia, 858,153 camels, horses, cows, sheep and goats perished as a result of harsh conditions, 9,115 of them from disease. Stressed and failed crops further exacerbated livelihood hardship in the agricultural sector, and had an impact on the country's food basket.

**Figure 14.3: Natural disasters, 2000–2016, number**



Source: National Emergency Management Agency, 2017.

Note: Includes forest and steppe fires, floods, snow and dust storms, dzuds, thunderstorms, avalanches and earthquakes.

**Table 14.1: Types of dzuds**

Types	Conditions	Effects
White (tsagaan) dzud	A thick layer of snow covers rangeland (most common form of dzud)	Affects large areas; prevents animals from grazing
Black (har) dzud	No snow in the winter and temperatures are consistently colder than average	Causes a water shortage and often coincides with a lack of winter grass
Iron (tumor) dzud	Snow melts and freezes, creating a covering of ice over the rangeland	Blocks access to pasture, preventing livestock from grazing
Hoof dzud	Drought	Depletes grassland
Combined (khavsarsan) dzud	A combination of any of the above conditions	Above effects are compounded, exacerbating the strain on livestock

Source: Disaster Research Institute, 2017.



**Photo 14.1: Black dzud, Burt Soum, Uvurkhangai Aimag**

### Earthquakes

Mongolia is located in a seismically active zone; approximately 80 per cent of the country's territory is seismically active. Parts of the country, and particularly the densely populated capital area, are subject to potentially severe seismic activity. The occurrence of unfelt seismic activity has been increasing since 2005, and particularly since 2009. The capital area of Ulaanbaatar is surrounded by four faults able to produce earthquakes of Magnitude 7 (M7). Based on a 2000 simulation, the Earthquake Disaster Risk Reduction Commission under the Government estimated that between 22 and 50 per cent of buildings and 60,000 residents would be affected if an M7 earthquake were to strike Ulaanbaatar. With the rapid expansion of the city, the potential losses would be far greater at the present time. More than 45 earthquakes annually of magnitudes from 3.5 to more than 6 on the Richter scale are recorded during the last 10-year period. Earthquakes of a magnitude greater than 8 were recorded four times in the twentieth century. Approximately 70 per cent of the capital city's buildings are identified as vulnerable to earthquake, including major hospitals, power plants

and other essential infrastructures. Additionally, the population is unaware of basic preparedness measures and necessary survival steps in the event of earthquake.

### Floods

Urban flash floods are a significant contributor to disaster risks in Mongolia. The risk is increasing due to the competition for limited space in urban areas, especially in Ulaanbaatar. Even the flood plains of the Tuul River and parts of Bogd Khan National Park are facing encroachment. Unplanned settlement areas, especially the ger districts, are expanding due to internal migration from rural areas. Ger districts at the city outskirts are often situated in flood pathways, where the residents have no protection from flash floods. Most of the flood protection infrastructures in Ulaanbaatar were established after the flood in 1966, the highest recorded since the 1940s. Due to poor maintenance, the flood protection system in Ulaanbaatar can bear neither intense rainfalls nor spring snowmelt water. The frequency of flash floods and extent of damage are increasing every year. For example, intense rainfall on 17 and 21 July 2009, (17–

51.6 mm for 30–60 minutes), resulted in relocation of almost 2,000 households with total damage valued at 2.7 billion tugriks (US\$1.93 million). Projected changes in rainfall patterns will directly affect human settlements, especially when these are expanding onto dried-up river channels.

#### Snow and dust storms

Heavy snowstorms are the severest of all disasters in Mongolia and result in casualties of predominantly nomadic herders who get lost in a snowstorm with or in search of their livestock. The most severe impacts of snowstorms were felt in 2011; 12 people died in snowstorms in January 2011 and another 11 in April 2011. Strong winds can break trees, tear down electricity and telephone posts and destroy houses and gers.

Approximately 60 per cent of dust storms in Mongolia occur in spring. Severe dust and sand storms affect air quality and reduce visibility. The airborne particles of fine and dry soil that originate in the deserts of Mongolia and northern China are carried eastward by prevailing winds and pass over the Republic of Korea, Japan and the Russian Far East and are sometimes carried much further, affecting air quality as far east as the United States. This sand and dust storm problem

has a transboundary and multifaceted impact on the environment, health, industry, livelihoods, urban infrastructure and agriculture, for not only the country but the region as a whole.

#### Forest and steppe fires

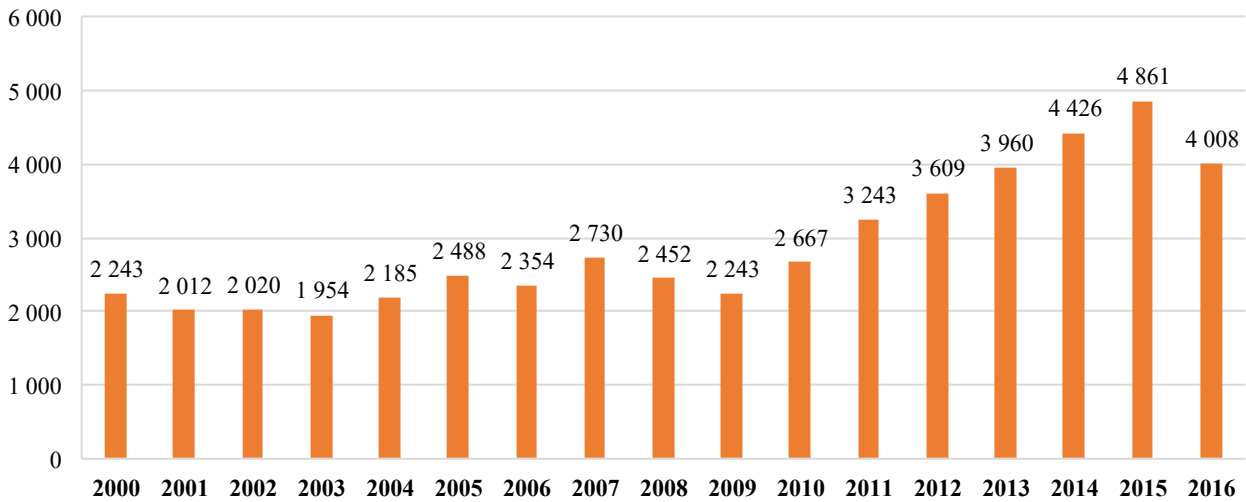
Numerous forest and steppe fires occur in Mongolia each year. Approximately 55.6 per cent of the country's territory is classified as vulnerable to forest and steppe fires. Although fire is a natural element of Mongolia's forest ecosystem regeneration, in many instances, forest fires are caused by human activities and result in numerous human casualties. The limited availability of personal protective gear and equipment for the professional fire fighters often results in casualties. Forest fire is the primary cause of forest degradation (figure 13.3), far ahead of any biotic hazard.

#### *Technological/anthropogenic hazards*

The country is also exposed to several types of serious technological/anthropogenic hazards (figure 14.4). These hazards cause immense damage to human life, health, properties, the environment, society and the economy.

**Photo 14.2: Icing in Bayanzurkh District, Ulaanbaatar, 2017**



**Figure 14.4: Technological/anthropogenic disasters, 2000–2016, number**

Source: National Emergency Management Agency, 2017.

Note: Includes building fires, industrial and traffic accidents, leakage of chemical and radioactive substances, and human and animal infectious diseases.

#### Building fires

More than 33,500 building fires occurred in the period 2005–2015 (compared with 2,132 forest and steppe fires in the same period).

#### Chemical spills and industrial accidents

Despite overall progress in chemicals management, Mongolia still faces challenges in this regard, due to the limited experience and knowledge of professional organizations and the general public. The country's preparedness for toxic chemical hazards has proven to be extremely weak, as evidenced by a notorious chemical spill at a gold mine in Khongor Soum, Darkhan-Uul Aimag, in 2007.

#### Animal diseases/epidemics

With Mongolia having approximately 61 million head of livestock, animal epidemics of viral and bacterial origins continue to cause substantial economic losses. Infectious animal diseases can be endemic with occasional human cases and pose serious public health risks, due to the fact that rural households are involved in raw meat processing. Common threats are foot and mouth disease, rabies, equine and camel influenza, avian and swine flu and anthrax. Foot and mouth disease outbreaks happen most frequently, affecting cloven-hoofed animals, including domestic sheep, goats, cattle and camels. As a fatal disease to young animals, it becomes extremely challenging to control when transmitted to wild herbivores, such as the Mongolian white-tailed gazelle. Large-scale

surveillance and appropriate preventive measures are required.

## 14.2 Disaster risk management

### *Disaster risk assessments*

The Ministry of Education, Culture, Science and Sports made a utilization safety evaluation of school and kindergarten buildings in 2012. The evaluation result shows that 97 buildings need to be retrofitted, and 120 buildings do not meet the standard of school building utilization. NEMA and the Education Department of the Ulaanbaatar City conducted detailed vulnerability assessments for 55 State-owned school and kindergarten buildings between 2015 and 2016 with technical support from the World Bank Project for Strengthening the Capacity of Disaster Risk Reduction in Mongolia. The flood hazard map of Ulaanbaatar City was developed in 2014 with support of the World Bank.

In addition, some district and soum disaster risk assessments have been made using the community-based risk assessment methodology. In 2014, the joint team of NEMA and World Vision Mongolia organized disaster risk assessments for two school buildings and three soums in western aimags in the framework of the Project of Disaster Risk Reduction in Western Provinces of Mongolia, funded by USAID. Eleven soums of five aimags, and two khoroos of Ulaanbaatar City, were assessed for their disaster risks with the support of the UNDP project Strengthening Local Level Capacities for Disaster Risk Reduction, Management and Coordination in Mongolia, between

2014 and 2016. Furthermore, the Red Cross Society of Mongolia organizes disaster vulnerability assessments with community participation.

#### *Early warning systems for disasters*

##### Broadband connections

In 2011 the Government of Mongolia started implementation of the National Broadband Programme (2011–2015), with the goal to provide access to inexpensive broadband connections for at least 50 per cent of all households in Mongolia, and wireless broadband service for 40 per cent of the households in remote areas.

##### Earthquake Disaster Warning System

The Earthquake Disaster Warning System project was implemented in the period 2012–2014. The project resulted in the Earthquake Disaster Warning System, which will help the Government to use advanced ICT systems to protect citizens from disasters such as earthquakes and floods (box 14.1).

#### *Instruments for disaster risk reduction, including land use zoning*

The 2014 Ulaanbaatar 2020 Master Plan and Development Approach for 2030 states that a new city land use zoning system will be introduced in Ulaanbaatar. The new zoning system proposed in the document will cover the entire area of Ulaanbaatar City and includes seven zones: residential, commercial, industrial, open space, mixed use, engineering infrastructure and special purpose. The city zoning will be the primary method of managing

and controlling new development in Ulaanbaatar. New land use zoning was designed to address current urban planning issues in Ulaanbaatar, including: i) the lack of an existing systematic city structure, organization and boundaries; ii) unplanned expansion of the city; iii) protecting public open space; iv) setting and reinforcing development and land use standards is challenging without a specific zoning system; v) enabling historic preservation; vi) establishing a system of land use, control and management.

### **14.3 Legal, policy and institutional framework**

#### *Legal framework*

The 2003 Law on Disaster Protection (no longer valid) built up the legal framework for disaster prevention, rescue, response and recovery measures, except for in circumstances involving war or weapons of mass destruction. The Law addressed the rights and responsibilities of the State, local authorities and other stakeholders, including citizens. The structure and management of disaster protection organizations were detailed for the state, aimag, capital city, soum, district, bagh and khoroo levels. The Law also designated budget sources to finance disaster protection activities. State activities are to be supported from the state budget. The local budgets are used for activities at the aimag, capital city, soum, district, bagh and khoroo levels.

The revised 2017 Law on Disaster Protection outlines the importance of conducting vulnerability and multi-hazard risk assessments. Legal entities with special licences issued by NEMA can perform disaster risk assessment, and NEMA should supervise these activities.

#### **Box 14.1: Earthquake Disaster Warning System**

The Earthquake Disaster Warning System project (2012–2014) was funded by the Government of Mongolia, with NEMA as the implementing agency. The South Korean telecommunications provider KT was chosen as the partner entity.

In 2013, Phase 1 of the project was completed, which included a control centre, 40 siren towers and three television and five radio systems. Phase 2, which included earthquake monitoring sensors, a mobile control centre and 20 more siren towers, was concluded successfully in 2014. This system will gather and analyse data being fed from sensors and broadcast information to respective stakeholders using wireless or wired networks in the event of a disaster.

The warning methods consist of siren towers, the emergency broadcasting system through television and radio, and the cell broadcasting service for mobile network operators. In the event of a disaster, those methods will broadcast disaster information to people within about 30 seconds. This system broadcasts warning messages to siren towers, the emergency broadcasting system through television and radio, and the cell broadcasting service, after getting disaster information from the Research Centre for Astronomy and Geophysics or NAMEM through special lines and controlling mechanisms of the Control Centre in NEMA.

*Source:* ESCAP, Building e-Resilience in Mongolia Enhancing the Role of Information and Communications Technology for Disaster Risk Management, 2016.

The Law has been strengthened in the following key areas: disaster risk reduction and prevention, humanitarian coordination, and recovery and reconstruction. A chapter on international cooperation and procedures for coordinating and facilitating foreign assistance in the event of a large-scale disaster response has also been introduced. The revised 2017 Law brings a number of positive changes into the disaster management system, including:

- Disaster terminology is newly defined to align with international DRM terminology;
- Phases of disaster protection are clearly defined;
- The legal environment to establish DRR national and local platforms was created;
- Coordination of domestic and international aid during disaster is emphasized;
- Roles, responsibilities and mandates of multiple stakeholders and agencies, including government agencies and NGOs, the private sector, volunteers and citizens, in DRR are clearly defined;
- Mandatory funds for DRR are required by the Law for state and local administrative bodies and legal entities.

The revised 2017 Law establishes national and local councils aimed at DRR, to ensure the participation and cooperation of state, private and intersectoral bodies and citizens and provide policy recommendations. In accordance with the Law, aimag and soum governors should also establish disaster protection units composed of 50–60 appointed professional personnel to be involved in disaster protection activities. The Law includes a chapter on the rights, roles and responsibilities of citizens and of public and private organizations and NGOs in DRM activities. Overall, the revised 2017 Law reflects four priority areas and seven global targets of the Sendai Framework and makes it clear that DRR is critical to development.

The implementation is guided by a number of acts of subsidiary legislation, such as the Regulation on Disaster Vulnerability and Risk Assessment (2006 Government Resolution No. 176); Regulation on Disaster Warning (2011 Government Resolution No. 339); Regulation on Mobilization of Resources and Evacuation during Disaster Situation (2011 Government Resolution No. 340); General Regulation on Fire Safety (2016 Government Resolution No. 339); Guidelines of Volunteer Activities for Disaster Protection (2016 Order of the Head of NEMA No. A/185); Regulation on the State Emergency Commission (2017 Government Resolution No. 152); and Regulation on Disaster Protection Specialized Professional Unit (2017 Order of the Deputy Prime Minister No. 75).

### *Policy framework*

#### 2016 Mongolia Sustainable Development Vision 2030

The 2016 Mongolia Sustainable Development Vision 2030 defines as the national priority "To strengthen the prevention system from climate hazards and natural disasters, and the national capacity to adapt to climate change".

#### 2010 National Security Concept

The 2010 National Security Concept (2010 Resolution of the State Great Khural No. 48) places strong emphasis on risk management of natural and technological/anthropogenic hazards.

#### 2011 State Policy and Programme on Disaster Protection

The 2011 State Policy and Programme on Disaster Protection (2011 Resolution of the State Great Khural No. 22) aims to strengthen the disaster management system. The document includes the State Policy on Disaster Protection and the National Programme on Strengthening Disaster Protection Capacity. This document is seen as a valid national strategy for disaster risk reduction.

The State Policy on Disaster Protection states the following strategic objectives:

- Strengthening the disaster management system and supporting the efficient involvement of national and local government agencies, professional organizations, the private sector and citizens in disaster protection activities;
- Conducting risk assessments of natural, human-made and technical disasters by each type and implement disaster vulnerability reduction activities at national level;
- Enhancing the legal and regulatory environment for coordination of humanitarian disaster relief operations, strengthening insurance coverage, empowering government and private sector commitment to disaster protection and promoting a common understanding of the terminologies used on this subject;
- Introducing the latest technologies and methodologies in the assessment and forecasting of potential disastrous and hazardous phenomena, and advancing the early warning system to establish efficient and effective information dissemination methods;
- Strengthening the capacity of human and technical resources for disaster response.

The National Programme on Strengthening Disaster Protection Capacity lists specific activities to reach the above strategic objectives. Two implementation phases are envisaged: 2011–2015 and 2015–2020.

In 2012, the Government adopted the Implementation Plan of the State Policy and Programme on Disaster Protection (2012 Government Resolution No. 30). The implementation is reviewed annually.

#### 2015 National Programme of Community Participatory Disaster Risk Reduction

The 2015 National Programme of Community Participatory Disaster Risk Reduction (2015 Government Resolution No. 303) covering the period 2015–2025 was adopted to guide the implementation of the State Policy on Disaster Protection with regard to building community resilience, with emphasis on women, children and vulnerable people, including low-income and poor people. The main purpose is to reduce disaster risks through involvement of communities and individuals in disaster prevention activities, enhancement of their knowledge and skills by organizing training and awareness, and strengthening safe living environments and culture, as well as resilience to climate change adaptation. The programme aims at:

- Building a legal environment and system for community-participatory DRR;
- Organizing community training and awareness in DRR at all levels;
- Planning and implementing DRR with community participation;
- Enhancing the emergency warning system for climatic and hydrometeorological hazard prevention information;
- Strengthening community resilience through climate change adaptation.

This Programme was followed by the 2016 Implementation Plan (2016 Order of the Deputy Prime Minister No. 50).

#### 2011 National Action Programme on Climate Change

The NAPCC was revised in 2011, for the period 2011–2021 (2011 Resolution of the State Great Khural No. 02). Among other matters, it considers systematic observation and monitoring of the climate, development of climatic scenarios, vulnerability and risk assessment and possible measures to adapt to climate change (chapter 7).

#### Other policy documents

Other relevant policy documents include the: 2015 National Plan for Prevention and Rescue of the Population, Animals and Properties from Disaster, Disaster Response and Early Recovery (2015 Government Resolution No. 416); 2016 Measures for Earthquake Prevention and Risk Reduction (2016 Resolution of the State Great Khural No. 34); 2016 Action Plan for Earthquake Prevention and Risk Reduction (2016 Government Resolution No. 282); 2016 General Procedure of State Disaster Protection Services (2016 Government Resolution No. 97); and 2016 General Procedure on Volunteerism in Disaster Management (2016 Order of the Deputy Prime Minister No. 34).

#### Draft strategy on disaster risk reduction for the period 2015–2030

The draft DRR strategy for the period 2015–2030 and a mid-term national action plan for disaster risk reduction for the period 2017–2020 were developed, based on the four priority areas and seven global targets of the Sendai Framework for Disaster Risk Reduction 2015–2030. The draft document was submitted in May 2017 for government approval.

#### *Integration of climate change into disaster risk reduction policies*

Three global frameworks approved in 2015 – the Sendai Framework for Disaster Risk Reduction 2015–2030, the 2030 Agenda for Sustainable Development and the Paris Agreement – are mutually dependent, with common targets and indicators. Both NEMA and the Ministry of Environment and Tourism have the same vision, that climate change and disaster risks must be addressed as one, as development can only be sustainable when it is risk informed. There is a good understanding of the interdependence of work on DRM, climate change adaptation and sustainable development. However, practical implementation of these linkages and institutional coordination encounter difficulties.

The Government is aware of the critical role of financing for DRM and climate change. It is considering increasing investments to strengthen the country's resilience. Key investment areas currently under discussion include health, education, social protection, agriculture, urban resilience, and emergency response and recovery.

*Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Targets 1.5, 11.5 and 11.b of the 2030 Agenda for Sustainable Development is described in box 14.2.



**Box 14.2: Targets 1.5, 11.5 and 11.b  
of the 2030 Agenda for Sustainable Development**



**Goal 1: End poverty in all its forms everywhere**

**Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.**

The indicators for this target are the number of deaths, missing persons and persons affected by disaster per 100,000 people (Indicator 1.5.1), direct disaster economic loss in relation to global gross domestic product (GDP) (Indicator 1.5.2) and number of countries with national and local disaster risk reduction strategies (Indicator 1.5.2).

According to the Data Book on Natural and Human-Induced Hazards in Mongolia (2014, 2015), the estimated average mortality rate from natural and human-induced hazards in Mongolia in the period 2000–2015 is 186 people per year. Over 51 per cent of the total deaths are due to human-induced hazards, 31.7 per cent of them from building fires. The average direct economic loss caused by natural and human-induced hazards in the period 2000–2015 amounted to 89.0 billion tugriks per year, which is equal to 3 per cent of GDP.

At national level, the country adopted the 2011 State Policy and Programme on Disaster Protection. It is now developing a new DRR strategy for the period 2015–2030, to be aligned with the Sendai Framework.

In order to achieve Target 1.5, which relates to building the resilience of the poor and further strengthens the position of DRR as a core development strategy, the Government should:

- Assess disaster risk, vulnerability, capacity, exposure, and hazard characteristics and their possible impacts (do risk profiling);
- Establish risk information systems and promote the collection, analysis, management, use and dissemination of the relevant data and information, using a geographic information system (GIS), and information and communication technologies and innovations;
- Incentivize businesses to conduct location-specific risk assessments of their operating environment and supply chain with a clear understanding of their hazard exposure, vulnerability and risks;
- Give additional emphasis to promoting policy coherence between DRM and development;
- Build capacity and leadership at the national and local levels.

**Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable**

**Target 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations**

The indicators for this target are the number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (Indicator 11.5.1) and direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters (Indicator 11.5.2).

In Mongolia, as a result of implementation of the 2011 State Policy and Programme on Disaster Protection and 2015 National Programme of Community Participatory Disaster Risk Reduction for the period 2015–2025, DRM activities are already designed to decrease the number of deaths and direct economic losses caused by hazardous events. To advance implementation of this Target, the Government should:

- Empower local authorities through regulatory and financial means to work and coordinate with civil society and communities in DRM at the local level;
- Establish direct and indirect incentives for incorporating DRR measures into public and private investment decisions;
- Strengthen the availability of financing for investments in resilience;
- Ensure that post-disaster relief, early recovery and reconstruction financing is provided in a sufficient and timely fashion, minimizing the indirect consequences of direct physical losses;
- Promote greater uptake and support to development of pre-disaster recovery plans, strengthening the links between disaster response efforts and long-term human development goals;
- Develop mechanisms to improve targeting of post-disaster assistance to the poor.

**Target 11.b: By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels**

The indicators for this target are the number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 (Indicator 11.b.1) and proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (Indicator 11.b.2).

Since the 1990s, Mongolia has been experiencing rapid rural-to-urban migration and urbanization. While a generation ago most Mongolians were nomadic herders, the majority of the population now resides in urban and mining centres. Migration from the countryside to urban settlements has been driven by the rapid conversion from a centrally planned to a market economy, creating greater economic opportunities in cities. The extent of international migration is also on the rise. This picture has been complicated by distress migration caused in general by the difficulty in sustaining a rural herding livelihood and fuelled by harsh winters (dzuds) and summer droughts. The rapid urbanization has largely been unplanned and has resulted in many development challenges, including a lack of access to basic services and high levels of air pollution in peri-urban settlements in the capital city during winter.

With respect to Indicator 11.b.1, the country is now developing a new national DRR strategy for the period 2015–2030, to be aligned with the Sendai Framework.

With respect to Indicator 11.b.2, in 2015, three Mongolian cities (Darkhan, Erdenet and Ulaanbaatar) officially joined the global campaign, "Making Cities Resilient: My City is Getting Ready", coordinated by the United Nations Office for Disaster Risk Reduction (UNISDR). These cities have integrated DRR into local development policy and urban action plans and work to ensure effective implementation. They are striving to increase public–private partnerships, strengthen community participation and explore opportunities to increase investment in DRR. A draft of the national DRR strategy for the period 2015–2030 includes specific activities to increase the number of Mongolian cities joining the global campaign.

There are no specific data addressing Indicator 11.b.2 at present. In the absence of such an indicator, Mongolia is not able to measure its progress towards Target 11.b. Creating a baseline for this indicator could be done through a questionnaire-based survey of local authorities.

In order to support the implementation of Target 11.b, the Government should:

- Raise awareness on the Sendai Framework through local campaigns and promoting local practices through development and adoption of local DRR, DRM and climate-change-adaptation strategies and plans by 2020. These strategies and plans should be based on improved local risk assessment and strengthened local government capacity to effectively monitor hazards, exposure and vulnerabilities;
- Allocate resources to local governments to implement DRM measures;
- Strengthen the leadership and capacity of local authorities, communities, civil society, volunteers, organized voluntary work organizations and community-based organizations;
- Encourage peer learning and cooperation between local governments.

### *Institutional framework*

Figure 14.5 shows the institutional framework for disaster protection in Mongolia.

At the highest political level, matters of disaster management are addressed through a State Security Council. In addition, the State Earthquake Council was established in 2016 and had its action plan approved by the Government (2016 Government Resolution No. 282).

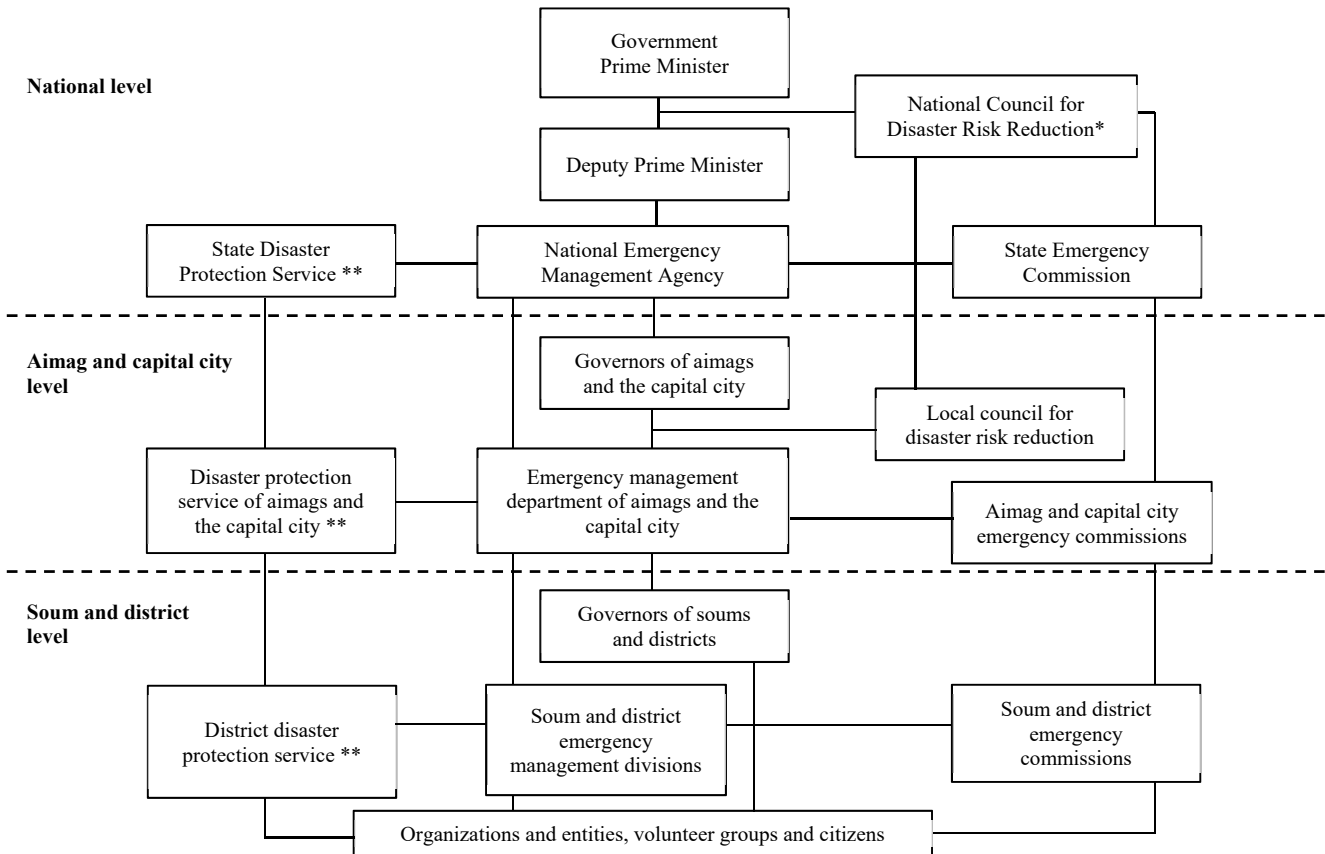
### National Emergency Management Agency

NEMA was established in 2004 through the unification of three entities: the State Board for Civil Defence, the Firefighting Department and the State Reserve Agency. NEMA is the lead agency for disaster mitigation, preparedness and emergency

management activities. It reports directly to the Deputy Prime Minister. NEMA develops DRR policies, which serve to protect and build the resilience of the population. NEMA's responsibilities are primarily defined by the revised 2017 Law on Disaster Protection, revised 2015 Law on Fire Safety, revised 2012 Law on Forests and the 2007 Law on State Reserve.

NEMA's capacity for emergency response has been improved at all levels in the last five years. In addition to conducting internal training, the organization's human resources capacity was strengthened through systematic training programmes implemented with the financial and technical support of international organizations, including UNDP, UNISDR, OCHA, JICA, the ADB, the World Bank and the Asian Disaster Preparedness Centre.



**Figure 14.5: Institutional framework for disaster protection**

Source: National Emergency Management Agency, 2017.

Note: \* The National Council for Disaster Risk Reduction is envisaged by the revised 2017 Law on Disaster Protection. As of mid-2017, the Council has not yet been set up as the necessary subsidiary legislation has not yet been adopted.

\*\* "Disaster protection service" at state, aimag, capital city, soum and district levels refers to all governmental bodies at the respective level identified by the legislation as responsible for disaster protection.

NEMA's operational capacity also increased, especially its search and rescue operations. Personnel protective equipment and a variety of Hazmat emergency response kits, firefighting and rescue tools were provided by partner United Nations agencies and humanitarian organizations.

The Disaster Research Institute under NEMA is responsible for carrying out multi-hazard risk assessments throughout the territory of Mongolia. However, risk assessment was eventually conducted only in a few sectors.

NEMA has approximately 3,900 emergency personnel, including officers, rescuers and firefighters disseminated across the country in the local emergency management divisions (at soum and district levels) or departments (at aimag level and in the capital city). In the event of a disaster, NEMA provides oversight, coordination and direct assistance. Overall, NEMA lacks sufficient disaster protection personnel and professional rescuers, and has a need for rescue equipment and other facilities.

The organization has a standardized, on-the-scene, all-hazards incident management approach. Effectively coordinating the activities of the various structures at national and local levels to optimize the use of available funds is among the recurrent challenges.

NEMA is working on capacity-building for emergency management and strengthening the equipment base for early warning. It is also working on creation of a disaster database.

#### National Agency for Meteorology and Environmental Monitoring

NAMEM is responsible for early warning of hazardous events with a short-, medium- and long-term perspective, and delivering the warnings to the public. Early warning work is being done in cooperation with NAMEM's departments within the aimags, which inform aimag and soum authorities on upcoming hazardous events. According to the 2015 Government Resolution No. 286 on early warning procedures, early warning information is communicated by NAMEM to NEMA, which

disseminates it to the public. NAMEM operates the radar system used for forecasting hazardous events. The radar system does not cover the entire country; it gives forecast information for an area within 200 km around Ulaanbaatar.

The activities of the Information and Research Institute of Meteorology, Hydrology and Environment under NAMEM include a research component, whereby the Institute utilizes weather satellite data required by NEMA and other institutions to provide information on natural disasters such as dzuds, droughts and forest/steppe fires.

The databases with information on natural disasters and forest and steppe fires are displayed on the website of the Environmental Information Centre (now downgraded to an Environmental Database Division (chapter 5)) ([http://eic.mn/index\\_disaster.php](http://eic.mn/index_disaster.php)).

#### State Emergency Commission

This commission was originally established by the Government in 1990 as the State Permanent Emergency Commission. Its four main functions included the national plan, coordination from the ministerial to the local government level, coordination of relief activities and oversight of reconstruction or rehabilitation measures in the cities and aimags.

The State Permanent Emergency Commission evolved into the current State Emergency Commission (SEC), which is the primary decision-making body for political and operational issues during a national emergency. The SEC is chaired by the Deputy Prime Minister and is responsible for elevating issues raised by NEMA and the humanitarian community to the Government. Funding requests and resource requirements are examples of the types of issues that are addressed by the SEC.

Several ministries are part of the SEC, including, among others, those responsible for agriculture, energy, the environment, health, foreign relations, finance, education, construction and urban development, and transport. Other members are GASI, the Mongolia Information Technology, Post and Telecommunication Authority, the National Police Agency, the Government Press Agency, the Nuclear Energy Commission, NAMEM, the Agency for Standardization and Metrology, the General Authority for Border Protection and the Customs General Administration. NEMA supports the SEC in overall crisis management, including planning at the interdepartmental and interagency levels.

#### Climate-change-related institutions

Since 2008, Mongolia has had Special Envoys for Climate Change. The National Climate Committee was active until December 2015. The Climate Change and International Relations Department of the Ministry of Environment and Tourism is responsible for policy issues and cooperation with the UNFCCC Secretariat (chapter 7).

#### Subnational level

While NEMA is the national-level operational disaster management entity, the aimags have their own administrative responsibilities. The emergency management departments under NEMA in all 21 aimags are responsible for disaster prevention, recovery, reduction of risks and vulnerabilities, and assessment of emergencies and disasters within the aimag. These units function as implementing agencies together with the aimag governor's office and are funded by the state budget. Aimag governors are responsible for leading the emergency response within the aimags.

#### *Involvement of communities*

Traditional early warning systems are present in communities that experience earthquakes and floods. In the most at-risk locations, people use their indigenous knowledge to prevent the adverse effects of hazards, and self-manage their relocation when disaster strikes.

Citizen participation is one of the principles of the revised 2017 Law on Disaster Protection.

Work is ongoing to establish DRR partnership councils and disaster prevention groups in many soums and districts. Members of such groups organize themselves to mitigate disaster risks and protect their sources of livelihood, such as livestock and crops. Such groups play an important role in local decision making, particularly in localities where DRR partnership councils have been established. Support for the establishment of such groups and DRR partnership councils has been provided by the UNDP project Strengthening the Disaster Mitigation and Management System in Mongolia, implemented in partnership with NEMA in the period 2002–2011.

In a few soums, by the special directive of the soum governor, disaster protection volunteer groups have been established to be involved in disaster protection activities.

Recently, Mongolia has launched a new partnership between the public and private sectors to prevent and reduce disaster risks, as the country looks to protect its economic growth and address its changing hazard profile. NEMA initiated the Public–Private Partnership Platform for Disaster Risk Reduction in Mongolia, with the two sectors agreeing to combine their efforts to strengthen the implementation of the Sendai Framework for Disaster Risk Reduction. In 2016, Mongolia’s Deputy Prime Minister signed an accord between NEMA and the Mongolian National Chamber of Commerce and Industry.

### *Financing*

DRM activities in Mongolia are mainly financed through the state and local budgets, as well as the budgets of various international projects and programmes aligned to support ongoing government DRM priority initiatives. Funding allocated for the implementation of the national and local DRR action plans are from the state and local budgets.

The State Reserve is administered by NEMA’s State Reserve Department, with funding used to procure stocks of food and goods, grains, fodder, fuel and industrial and security equipment for the purposes of economic security and disaster response. There are separate budget lines for each category of goods. The stocks are strategically dispersed across the country in locations referred to as reserve spots. Further reserves in kind are held by aimag and soum authorities. The size of each type of stock held in reserve at the state, aimag and soum levels is set out in the legislation. Stocks can only be released on the instruction of the SEC. The SEC also determines whether any stock releases will be sold or distributed free of charge, and whether any resulting revenue will be used for stock replenishment or will revert to the State Treasury. Additional financial resources for the State Reserve can sometimes be secured via budgetary reallocations and mid-year adjustments of the budget. Any remaining funding at the end of the fiscal year reverts to the general government coffers and is not rolled over.

The Government Reserve is held by the Ministry of Finance and is available for a wide range of unforeseen purposes, including natural and technological hazards and human and livestock epidemics. A portion of the Reserve is apparently ring-fenced each year for disaster events and epidemics.

In the event of urgent emergency situations (e.g. relating to fire), aimags provide immediate support to affected communities and then seek reimbursement

via the SEC from the Government Reserve and/or State Reserve.

Aimags have latterly been required to submit reports to NEMA on the use of resources provided from the Government Reserve, under what is referred to as the disaster relief account. NEMA compiles these reports into a single document for submission to the State Treasury. Expenditure reports relating to the use of the State Reserves budget are also compiled by NEMA.

Individual line agencies have no specific disaster contingency budget lines of their own. Some line ministries have disaster preparedness budgets which, in theory, could also be used for disaster response. In practice, however, these budgets are very small and there is no surplus for response purposes.

Thus, total funding for DRM and countering climate change measures has always been insufficient in the country, despite Mongolia implementing certain DRM and climate projects and programmes under bilateral agreements with donor countries (including Germany, Japan, the Republic of Korea, Switzerland and the United States) and international organizations (including the ADB, GEF, UNDP, UNEP and the World Bank) and having received project funding from the Adaptation Fund (with a project being implemented through the UNDP Country Office in Mongolia).

### *International cooperation*

Mongolia worked hard to enhance international cooperation on DRM. A number of DRM projects were developed in close partnership with the ADB, JICA, UNDP, the World Bank, World Vision Mongolia, Mercy Corp and Mongolian Red Cross Society, and successfully implemented in the country. The United Nations humanitarian agencies and international NGOs have played an important role in supporting the Government to promote DRM through implementation of several activities, such as the development of laws, policies and strategies for DRR, sector- and commodity-based resilience building and development of early warning systems. The response of humanitarian partners to the impact of successive dzuds that affected the entire country, as well as localized disasters such as floods, fires, droughts and epidemic diseases in various parts of the country, is widely acknowledged. However, overall DRR efforts need to move from largely reactive to preventive actions.

Mongolia has actively partnered and collaborated with UNISDR. In particular, Mongolia participated in and contributed to the UNISDR working group for the

development of the indicators for the Sendai Framework global targets to be used for measuring progress on implementation of the Sendai Framework. The ISDR Asia Partnership Meeting in 2017 in Ulaanbaatar was jointly organized by the Government and the UNISDR Regional Office for Asia and the Pacific. Three Mongolian cities have joined the UNISDR-coordinated global campaign, "Making Cities Resilient: My City is Getting Ready", with their senior staff having received training on implementing the campaign.

The Deputy Prime Minister of Mongolia was recognized as an Asian Champion for Disaster Risk Reduction at the Global Platform for Disaster Risk Reduction in Mexico in May 2017, for his consistent passion, commitment and achievements on the issue. In 2018, the Government, in cooperation with UNISDR, will host the Asian Ministerial Conference on Disaster Risk Reduction in Ulaanbaatar. NEMA and the National Chamber of Commerce and Industry have expressed preliminary interest in establishing a national branch of UNISDR's Private Sector Alliance for Disaster Resilient Societies (ARISE).

#### 14.4 Assessment, conclusions and recommendations

##### *Assessment*

Significant advances in DRR and DRM have been made over the last decade, largely driven by the lessons learned from droughts, dzuds, forest fires and other natural and human-induced disasters that occurred in the country. Response to the 2009–2010 dzud highlighted shortcomings in preparedness, communication and response that triggered stronger action to integrate DRR into national policies, including those on climate change adaptation and sustainable development.

Government officials are well aware of the importance and interdependence of key international documents such as the Sendai Framework for Disaster Risk Reduction 2015–2030, the 2030 Agenda for Sustainable Development, and the Paris Agreement, which are seen as the drivers of the national development agenda. The Government progressively developed policies and plans for DRR and DRM in partnership with, and with the assistance of, many international organizations and as a result of national-level projects designed to build the country's capacities.

In the past, many development decisions have been made with little regard to their consequences for the vulnerability of the population and infrastructure.

Some decisions have created risk internal to the development itself, such as through failure to consider seismic risk in building design or site selection. Some decisions have encouraged populations to move into hazard-sensitive areas by establishing public infrastructure and jobs in those locations. Many development actions currently under review by the Government may carry potential disaster risk, but they also provide opportunities to strengthen resilience. The integration of disaster risk concerns into Mongolia's national development actions should be at the heart of actions to strengthen the country's disaster resilience.

There is a wide range of measures that the Government, its development partners and civil society can take to strengthen disaster resilience. Significant resource constraints imply that available DRM resources need to be used as strategically and cost effectively as possible. By implication, there is an urgent need to focus more heavily on the root causes of disasters, seeking to tackle the issues that create disaster risk both through ex-ante risk reduction efforts and by building resilient communities in the aftermath of disasters.

##### *Conclusions and recommendations*

##### Policy framework for disaster risk management and climate change

Implementation of the 2011 State Policy and Programme on Disaster Protection is under way. The Government is now developing a new national strategy on disaster risk reduction for the period 2015–2030, to be aligned with the Sendai Framework and the relevant targets of the 2030 Agenda for Sustainable Development. At local level, three Mongolian cities (Darkhan, Erdenet and Ulaanbaatar) have officially joined the global campaign, "Making Cities Resilient: My City is Getting Ready", meaning that they have integrated DRR into local development policy and urban action plans and are working to ensure effective implementation. There is no information on other local governments that have adopted and implemented local DRR strategies. There is a good understanding of the interdependence of work on DRR, climate change adaptation and sustainable development, but practical implementation of these linkages and institutional coordination encounter difficulties.

##### Recommendation 14.1:

*The Government should enhance coherence and increase the effectiveness of national disaster risk management, climate change adaptation and sustainable development efforts by:*

- (a) *Ensuring that future national and local strategic documents on disaster risk management are closely linked to and feed into the broader national sustainable development agenda;*
- (b) *Mainstreaming and integrating disaster risk management and climate change adaptation into sectoral and local development plans and budgets;*
- (c) *Exploring the opportunity of developing a joint work plan or alignment of the national disaster risk management and climate change adaptation action plans.*

#### Urban infrastructure

Since the 1990s, Mongolia has been experiencing rapid rural-to-urban migration and urbanization. Such urbanization has largely been unplanned and has resulted in many development challenges, including a lack of access to basic services and high levels of air pollution during winter in some areas. Ger districts at the Ulaanbaatar City outskirts are often situated in flood pathways, where the residents have no protection from flash floods. Addressing these challenges is crucial for achieving progress with Targets 1.5, 11.5 and 11.b of the 2030 Agenda for Sustainable Development.

#### Recommendation 14.2:

*The Government should:*

- (a) *Conduct inventory, vulnerability and risk assessment of infrastructure facilities in urban areas;*
- (b) *Provide guidance and support for the redesign and retrofitting of urban infrastructure;*
- (c) *Ensure the integration of disaster risk management and climate change adaptation aspects into construction, zoning and other relevant regulations.*

#### Capacity and coordination

There are multiple challenges faced by the DRM system as far as preparedness, response and recovery planning are concerned. Emergency preparedness and response capacities are more developed at the national level, although NEMA still lacks sufficient personnel and equipment. At the local level, international organizations and NGOs support government efforts and provide technical assistance with emergency response services, especially in regions frequently affected by disasters. Traditional early warning systems are present in communities that experience earthquakes and floods. In the most at-risk locations, people often use their indigenous knowledge to

prevent the adverse effects of hazards, and self-manage their relocation when disaster strikes. Effective coordination of the activities of all DRM structures at national and local levels to optimize the use of available funds and resources is among the recurrent challenges.

#### Recommendation 14.3:

*The Government should enhance disaster preparedness, response, recovery, rehabilitation and reconstruction efforts by:*

- (a) *Building the capacities of stakeholders in contingency planning through training in order to improve their state of preparedness in the face of different hazards;*
- (b) *Developing, simulating and validating response plans at national and aimag levels to be better prepared and respond to disasters;*
- (c) *Strengthening capacities (personnel, equipment) of the National Emergency Management Agency;*
- (d) *Enhancing the coordination and monitoring of disaster response resources;*
- (e) *Developing mechanisms to improve targeting of post-disaster assistance to the poor, limiting the use of informal disaster coping mechanisms, which can have detrimental consequences on long-term development.*

#### Understanding the disaster and climate risks

In Mongolia, the majority of institutions and professionals, at all levels of administration (from central to local) have a good understanding of disaster and climate risks and a fair understanding of what DRM means for their field of work. Various technical institutions are formally mandated for data collection and forecasting, such as NEMA's Disaster Research Institute, among others. However, risk assessment was eventually conducted only in a few sectors. Certain capacities are still required for systems to perform fully, including systems for data gathering and analysis, early warning and integrated information management.

#### Recommendation 14.4:

*The Government should increase the awareness and understanding of disaster risk management concepts and practices of all stakeholders involved in the disaster risk management system by:*

- (a) *Conducting on a regular basis multi-hazard risk assessments;*
- (b) *Developing and updating the national multi-hazard risk profile and integrating climate*

- 
- change scenario modelling into the national disaster risk profile;*
- (c) *Setting up a coordination mechanism for data collection and information sharing between relevant entities;*
- (d) *Raising awareness, educating and building capacities and skills for effective community and citizen engagement in disaster risk management activities.*



## HEALTH, FOOD SAFETY AND ENVIRONMENT

### 15.1 Population health status

#### *Population development*

The population of Mongolia was estimated to be 2,043,954 at the end of 1989; it has since increased, to 2,307,484 at the end of 1997, 2,620,446 at the end of 2007 and 3,119,935 at the end of 2016. This evolution is marked by an increase in the population living in urban areas: 1.215 million (52.7 per cent) at the end of 1997 and 2.131 million (68.3 per cent) at the end of 2016. In 2016, 67 per cent of the urban population live in Ulaanbaatar. Conversely, the population living in rural areas has decreased; it was fewer than 1 million (993,862) in 2004 and remained under 1 million (988,112) at the end of 2016.

In 2016, 18.7 per cent of the Mongolian population was in the Khangai region, 15.8 per cent in the central region, 12.6 per cent in the western region, 6.8 per cent in the eastern region and 46.2 per cent in Ulaanbaatar. The massive migration of population to Ulaanbaatar results in difficulties for the city in accommodating this population and leads to the formation of ger districts in the area surrounding the city. Around 200,000 families, with an average three to five persons per family, live in the Ulaanbaatar ger districts in an unhealthy environment. The degraded sanitary, environmental and social conditions are more prone to the development of diseases.

At the end of 2016, the female population constituted 50.8 per cent of the total and males 49.2 per cent.

The proportion of the population under 5 years of age reached 12.6 per cent at the end of 2016, compared with 10.1 per cent at the end of 1997. The proportion of the population aged 5–14 years reached 17.4 per cent at the end of 2016, compared with 26.3 per cent at the end of 1997. The proportion of the population aged 15–64 years reached 66.2 per cent at the end of 2016, compared with 59.7 per cent at the end of 1997. Those aged over 65 years represented 3.8 per cent of the population at the end of 2016.

The birth rate increased from 21.6 (per 1,000 population) in 1997 and 21.7 in 2007 to 25.9 in 2016. Most live births (54.3 per cent) were delivered in 2016 by women 20–29 years of age; the proportion of live births delivered by mothers aged under 20 decreased

from 8.1 per cent in 1997 to 4.0 per cent in 2007 and reached 5.4 per cent in 2016. In 2016, the general fertility rate was 95.3 (live births per 1,000 women), compared with 79.2 in 1997 and 72.3 in 2007.

During the last two decades, the health status of the Mongolian population improved. A person born in 2016 can expect to live for 69.6 years, on average – 75.1 years if female and 65.6 years if male. Average life expectancy at birth has increased by 6.4 years over the period 2000–2016 (63.2 years in 2000 and 69.6 years in 2016). Since 2000, the lowest life expectancy values are observed in Dornod Aimag (58 years in 2000, 63.9 years in 2010 and 68.63 years in 2016) and Khuvsgul Aimag (59 years in 2000, 63.6 years in 2010 and 66 years in 2016).

#### *Child and maternal mortality*

The under-5 mortality rate was 24.5 (per 1,000 live births) in 2010, 18.7 in 2012 and 20.8 in 2016. In 2015, the major causes of death in under-5-year-olds were related to certain conditions originating in the perinatal period, congenital malformations, deformations and chromosomal abnormalities, and diseases of the respiratory system. As described in Mongolia's 2015 national report, "Managing the transition from the Millennium Development Goals to the Sustainable Development Goals", there are considerable discrepancies in children's health status related to parental education, household income, infrastructure development and geographical location. Additionally, in selected poverty-prone areas, a decline in household income leads to food shortages, which in turn results in malnutrition among infants and under-5-year-old children.

The infant (under-1-year-old) mortality rate gradually decreased from 64.4 per 1,000 live births in 1990 to 17.6 in 2007 and 16.8 in 2016. In 2015, the infant (under-1-year-old) mortality rate was 15.3; the highest infant mortality rate is observed for the western region (22 per 1,000 live births).

In 2016, the major causes of infant (under-1-year-old) morbidity were diseases of the respiratory system (54.3 per cent in urban areas and 63.9 per cent in rural areas), followed by infectious and parasitic diseases (12.6 per cent in urban areas and 7.9 per cent in rural areas). Diseases of the respiratory system are also the



major causes of under-5 morbidity (57.5 per cent in urban areas and 68.8 per cent in rural areas in 2016) (table 15.1).

The maternal mortality ratio declined from 89.6 per 100,000 live births in 2007 to 42.6 per 100,000 live births in 2013, and increased to 48.6 per 100,000 live births in 2016. In 2016, the average maternal mortality ratio at aimag level was 56.0 per 100,000 live births and the Ulaanbaatar maternal mortality ratio was 41.8 per 100,000 live births.

In 2015, 99.6 per cent of all births were attended by skilled personnel.

In 2016, about 83.6 per cent of pregnant women had at least six control visits during their pregnancy. Five per cent of mothers were under 20 years old while 15.4 per cent were older than 35. In 2016, the abortion rate was 21.5 abortions per 1,000 women of reproductive age (18,316 registered abortions). The abortion rates

by age group were 5.0 per cent for women under 20 years, 70.7 per cent for women 20–34 years old and 24.3 per cent for women over 35 years old.

#### *Mortality by main causes of death*

In 2016, 16,181 deaths were registered; 40 per cent of the deceased were females and 60 per cent males. In 2016, the major causes of death were diseases of the cardiovascular system (33.3 per cent) and neoplasms (25.6 per cent) (table 15.2). External causes (injury, accidental poisoning and other consequences of external causes) represented 15.0 per cent of deaths. Diseases of the respiratory system were the leading cause of death in 1990 (31.3 per cent), but decreased to 4.5 per cent in 2005 and stayed between 3.4 and 4.5 per cent in the period 2005–2016. In 2014, the probability of dying between the ages of 30 and 70 years from the four main non-communicable diseases (NCDs) was 32 per cent.

**Table 15.1: Causes of infant and under-5-year-old morbidity, 2016, per cent**

	Age			
	0-1 age		Under-5	
	Urban	Rural	Urban	Rural
Diseases of respiratory system	54.3	63.9	57.5	68.8
Diseases of digestive system	9.9	9.7	8.7	12.6
Conditions originating in the perinatal period	7.9	3.7	4.0	2.3
External causes of morbidity and mortality	1.9	0.7	7.0	1.9
Infectious and parasitic diseases	12.6	7.9	7.6	3.3
Diseases of skin and subcutaneous tissue	4.9	3.7	9.6	4.8

Source: Centre for Health Development, Health Indicators 2016, 2017.

**Table 15.2: Death by classification of the leading causes, 1990, 1995, 2000, 2005, 2010–2016**

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
<b>All deaths, number</b>	16 401	16 184	15 472	15 469	17 276	17 127	16 923	16 192	16 495	16 374	16 181
of which:											
Female	7 787	7 164	6 789	6 003	6 951	6 556	6 471	6 459	6 558	6 552	6 519
Male	8 614	9 020	8 683	9 466	10 325	10 571	10 452	9 733	9 937	9 822	9 662
<b>Leading causes, per cent</b>											
Cardiovascular disease	15.66	30.85	31.33	38.29	37.69	36.73	35.09	35.09	34.37	34.15	33.31
Disorders of blood and blood-forming organs and immune mechanisms	0.80	0.34	0.24	0.14	0.16	0.08	0.14	0.12	0.13	0.16	-
Cancer	16.37	18.52	19.57	18.86	20.79	20.65	21.22	23.44	24.32	24.60	25.60
Disorders of injury, poisoning and external causes	4.83	8.69	11.74	18.26	16.14	18.26	18.88	17.22	16.72	15.65	15.02
Diseases of the respiratory system	31.32	15.79	8.83	4.52	4.34	3.88	3.78	3.40	3.55	3.74	4.32
Diseases of the digestive system	13.94	7.93	7.20	8.07	8.47	8.95	8.93	8.38	7.72	8.01	7.45
Infectious and parasitic diseases	4.54	5.54	3.24	3.06	2.14	1.75	1.78	1.86	1.89	2.00	2.86
Disorders of the urinary system	2.35	2.65	2.28	2.00	1.65	1.46	1.22	1.06	1.27	1.63	1.52
Disorders occurring in the perinatal period	5.24	2.55	2.85	2.92	3.77	3.35	3.70	3.81	4.20	4.49	3.60
Diseases of the nervous system	3.99	1.78	1.61	1.51	1.84	1.63	1.88	1.78	1.91	1.87	2.04

Source: National Statistics Office, 2017.

*Selected trends in morbidity*

In 2016, hospital admission rates were 2,102.1 per 10,000 males and 3,416.7 per 10,000 females. In 2016, the major causes of hospitalization were linked to diseases of the respiratory system (456.1 per 10,000), diseases of the cardiovascular system (399.3 per 10,000), diseases of the digestive system (332 per 10,000), urogenital system diseases (306.1 per 10,000) and nervous system diseases (193.7 per 10,000)

*Non-communicable diseases*

NCDs are estimated, in 2016, to account for 16,181 deaths (85.4 per cent of total deaths). The leading causes of mortality in 2016 were diseases of the circulatory system (33.3 per cent), cancer (25.6 per cent), injuries, poisoning and certain other consequences of external causes (15.0 per cent), diseases of the digestive system (7.4 per cent) and diseases of the respiratory system (4.3 per cent).

During the period 2005–2016, morbidity from all NCDs increased. Diseases of the respiratory system was the leading cause of morbidity, increasing from 829 cases per 10,000 population in 2005 to 1,647.4 cases per 10,000 population in 2016. The morbidity rate from diseases of the respiratory system was 1,623.3 per 10,000 population in urban areas and 1,659.1 in rural areas.

As of 2016, the five leading causes of population morbidity per 10,000 population were: diseases of the respiratory system (1,647.4 cases per 10,000 population), diseases of the digestive system (1,231.4 cases per 10,000 population), diseases of the circulatory system (1,007.6 cases per 10,000 population), diseases of the genito-urinary system (807.6 cases per 10,000 population), and injuries, poisoning and other consequences of external causes (469.9 cases per 10,000 population). Detailed data are not available on the characterization of diseases, such as asthma, allergy and asbestosis, with respiratory disease origin.

Since 1990, cancer has remained the second leading cause of population mortality and accounted for 25.6 per cent of all deaths in 2016. The leading five causes of cancer in males were cancers of the liver (42.2 per cent), stomach (20.9 per cent), lung (11.9 per cent), oesophagus (5.7 per cent) and pancreas (3.7 per cent), whereas cancers of the liver (36.9 per cent), cervix (13.9 per cent), stomach (10.5 per cent), breast (7.1 per cent), oesophagus (5.6 per cent) and ovary (3.8 per cent) were the main causes for women.

According to WHO, around 19 per cent of all cancers worldwide were estimated to be attributable to environmental factors. For example, air pollution from indoor burning of coal or biomass was associated with substantial increase of lung cancer risk. It was estimated that 14 per cent of lung cancers are attributable to ambient air pollution, 17 per cent to indoor air pollution and 6.6 per cent to occupational risks.

There is evidence that environmental pollution in Mongolia is above acceptable levels in urban areas, especially concerning air pollution (chapter 8). In Mongolia, there is no baseline information and no database on the level of environmental carcinogens (air, soil, water). Consequently, no systematic measures are being taken to reduce environmental carcinogens to allowable levels.

In 2016, 417,241 people (42 per cent of males and 58 per cent of females) were screened to detect arterial hypertension at an early stage. A total of 76,969 people were involved in the follow-up medical examination after screening. Of these, 9,605 people (2.3 per cent) were diagnosed with arterial hypertension. In the same year, 392,233 people were screened for early detection of diabetes. Cancer prevention and monitoring actions are also performed. In 2016, early screening for cervical cancer was performed on 73,706 women and 286,921 women were screened for breast cancer.

*Communicable diseases*

In 2016, 69,663 cases of 29 different communicable diseases were registered, and 57.7 per cent of all infectious diseases were registered in Ulaanbaatar City. In 2016, 62.0 per cent of communicable diseases were respiratory diseases, 21.5 per cent were sexually transmitted infections (STIs), 13.0 per cent were intestinal infections and 0.7 per cent were zoonotic bacterial diseases.

In 2016, there were 277 deaths caused by communicable diseases: 132 cases of measles, 112 cases of tuberculosis, 15 cases of syphilis, 8 cases of HIV/AIDS, 5 cases of viral hepatitis, 2 cases of tick-borne encephalitis, and one case each of infectious meningitis, varicella and malaria.

Respiratory infections

In 2016, among the 43,198 cases of respiratory infections, 70.1 per cent were measles, 15.8 per cent varicella, 9.4 per cent tuberculosis and 3.2 per cent scarlet fever. Compared with 2015, tuberculosis decreased by 1.2 cases per 10,000 population, while measles, varicella, scarlet fever, mumps and infectious

erythema increased, by 19.8, 3.3, 3.0, 0.3 and 0.2 cases per 10,000 population, respectively.

Pneumonia is the syndrome caused by infection of the lung tissue, usually caused by bacteria or virus. Most cases occur in children under 2 years of age. Malnutrition, crowding and smoke exposure are the most important risk factors for pneumonia. Extreme cold also predisposes to pneumonia. In rural and remote areas and among poor families, children are at a higher risk.

### Tuberculosis

In 2016, tuberculosis (TB) remains highly prevalent, with an incidence rate of 13.2 cases per 10,000 population (country average), and constitutes a major threat to public health (table 15.3). Incidence rates above the national incidence rate are registered in Selenge Aimag (18.0 cases per 10,000 population), Ulaanbaatar (17.7), Darkhan-Uul Aimag (17.4), Dornod Aimag (15.6), Govisumber Aimag (15.1) and Kenti Aimag (13.6).

In 2016, of the 4,045 registered new cases of tuberculosis, 2,469 (61.0 per cent) were registered in Ulaanbaatar. By age group, 63.6 per cent of the registered new cases were in people aged 15–44: 53.5 per cent were males and 46.5 per cent females. Among these, 2,131 of new cases were pulmonary tuberculosis and the remainder (47.3 per cent) extra pulmonary tuberculosis. In 2016, case detection care and cure rates have reached 84.8 per cent and 80.64 per cent respectively.

In Ulaanbaatar, multidrug-resistant tuberculosis was

diagnosed in more than one third of new sputum smear-positive TB patients for whom treatment had failed. During the period 2006–2012, the proportion of new TB patients with multidrug-resistant TB increased from 0 per cent to 17 per cent.

### Measles

The proportion of 1-year-old children immunized against measles has increased since 1991. In 1991, 82 per cent of 1-year-old children were immunized against measles, 90.6 per cent in 1997, 98.5 per cent in both 2002 and 2007, and 97.5 in 2015. A low decrease was observed in 2013 (94.5 per cent) and 2014 (94.7 per cent) for children in Ulaanbaatar.

In 2012, 2013 and 2014, almost no cases of measles were reported. In 2013, child morbidity from measles reached 0.1 of registered cases per 100,000 children (2 registered cases).

A measles outbreak started before March 2015. The Ministry of Health and Sports reported 105 fatalities in the first four months of the year. Of those, 59 were laboratory-confirmed cases and 46 were clinically confirmed cases. Ninety per cent of all fatalities were infants up to 8 months of age. Altogether, in 2016, 30,273 cases of measles were reported in all 21 aimags. Globally, measles is still one of the leading causes of death for children less than 5 years of age, despite the availability of a safe and effective vaccine that prevents this deadly disease. In addition, studies have shown that measles virus infection often results in pneumonia or diarrhoea, which contributes to the total number of children who die of causes related to measles.

**Table 15.3: Selected reported infectious and parasitic diseases, 2007, 2011–2016, cases per 10,000 population**

	2007	2011	2012	2013	2014	2015	2016
Salmonella infections	..	0.4	0.4	0.3	0.3	0.5	0.6
Shigellosis	..	7.6	7.4	7.0	7.9	9.2	9.3
Tuberculosis	16.8	14.3	14.2	14.6	14.2	14.4	13.2
Brucellosis	..	1.4	1.6	1.3	0.9	1.0	0.5
Varicella	..	11.1	10.1	16.6	15.8	19.0	22.3
Measles	..	0.0	0.0	0.0	0.0	79.2	99.0
Viral hepatitis	38.4	52.8	24.7	9.0	3.9	3.0	1.9
A	..	49.0	21.2	5.7	1.1	0.3	0.1
B	..	2.7	2.3	2.2	2.0	1.6	1.2
C	..	0.5	0.6	0.4	0.4	0.4	0.3
Mumps	3.7	3.7	32.6	18.7	1.5	0.8	1.1
Syphilis	12.7	15.3	17.8	22.2	23.5	25.9	20.3
Gonococcal infection	17.5	18.6	19.2	17.2	15.5	16.8	14.3
Trichomoniasis	..	14.4	15.0	13.5	13.0	13.6	14.3

Source: Centre for Health Development, Health Indicators 2016, 2017.

Although it is reported that the vaccination coverage rate is very high, i.e. 96 per cent, the 2015 outbreak demonstrated that there was an immunization gap in certain groups of the population. According to the currently available epidemiological analysis, the most affected age groups are people aged 18–30 and young infants before they are eligible to receive the first dose of measles vaccine at nine months of age. This finding suggests that there is an immunity gap against measles among people who were born between 1986 and 1998 (currently 18–30 years of age) and newborn infants who are too young to receive the first dose of measles vaccine and are not protected by the immunity of the mother. The only way to close the immunity gap for both groups was to conduct a vaccination campaign with measles-containing vaccine. Thus, the Government decided to conduct the supplementary immunization activity for people aged 18–30 years in May 2016.

#### Intestinal infection

In 2016, 9,086 cases of intestinal infection were registered, among which, 61.3 per cent were hand-foot-mouth disease, 31.3 per cent dysentery, 4.7 per cent food poisoning, 2.0 per cent salmonella, 0.4 per cent viral hepatitis and 0.2 per cent diarrhoeal infection.

In May 2008, a serious outbreak of hand-foot-mouth disease due to Enterovirus 71 affected thousands of children and families throughout Mongolia, whereas only 3,210 cases were reported. Of the reported cases of enterovirus disease, 83 per cent occurred in children who were younger than 10 years and 10 per cent of those infected were younger than 1 year. Hygiene promotion activities were performed by volunteers and staff of the Mongolian Red Cross Society in order to deliver important messages to the public about the prevention of this disease.

An outbreak of cholera involving approximately 100 persons occurred in 1996 but was rapidly brought under control. No cases have been identified since then, but the source of the outbreak remains uncertain.

In 1999, there were 19 people infected with typhoid, due to a waterborne outbreak in the centre of Dundgovi Aimag. In 2000, 291 cases of waterborne viral hepatitis A were reported in Uvurkhangai Aimag.

In 2004, a waterborne epidemic occurred in Khankhongor Soum and 123 people were infected with dysentery.

#### Viral hepatitis

In 2016, 566 cases of viral hepatitis were registered: 64.8.1 per cent were viral hepatitis B, 18.2 per cent viral hepatitis C, 6.9 per cent viral hepatitis A and 28.3 per cent other viral hepatitis.

The incidence of all hepatitis varied from 38.4 cases per 10,000 population in 2007 to 52.8 in 2011, the maximum since 2005, and then decreased to 3.9 in 2014, 3.0 in 2015 and 1.9 in 2016.

Vaccination and the use of single-use syringes help to reduce the incidence of viral hepatitis.

#### Sexually transmitted infections

In 2016, 21.5 per cent of cases of registered communicable diseases were sexually transmitted infections (STIs) (14,964 cases): 41.4 per cent were syphilis, 29.2 per cent gonorrhoea, 29.2 per cent trichomoniasis and 0.2 per cent HIV/AIDS. Compared with 2015, an decrease in congenital syphilis cases was observed in 2016. Indeed, 42 cases of congenital syphilis were registered in 2016 (52 cases in 2015), 25 of which were registered in Ulaanbaatar. This decrease in congenital syphilis cases was attributed to improved pregnancy monitoring. In 2016, the highest STI incidence rates were registered in Bayankhongor (36.5 cases per 10,000), Dornod (34.7), Sukhbaatar (31.5), Khuvsgul (26.5), Govi-Altai (24.0), Tuv (23.7), Govisumber (23.6) and Dornogovi (21.3) Aimags and Ulaanbaatar City (22.2). The morbidity of trichomoniasis was higher in Dornod (60.7), Bayankhongor (53.3), Bulgan (17.5) and Sukhbaatar (15.8) Aimags and Ulaanbaatar City (15.4), and was higher there than the national average (14.3) and aimag average (13.3).

Since the first registered case of HIV/AIDS in Mongolia in 1992, there have been 225 registered cases of HIV/AIDS by the end of 2016. The incidence of HIV infection has slowly increased in Mongolia since 2005. Indeed, while 11 new cases were registered in 2005, 26 new cases were registered in 2016; the maximum number of new cases was 31, in 2014. Mortality related to HIV infection was also the highest in 2014, with five registered deaths.

Almost all cases of HIV infection (98 per cent) were transmitted through sexual transmission. Infections transmitted through blood transfusion, medical assistance or from mother to child are not yet registered.

### Zoonosis and vector-borne diseases

In 2016, 0.7 per cent of communicable diseases were zoonotic diseases.

Rodents were frequently observed and herders complain about this proliferation. Rodents are involved in several disease transmissions, such as plague and leptospirosis, and may be part of the tick-pathogen cycles.

#### Plague

Plague is known to be endemic in several areas of Mongolia, but transmission to humans seems to play only a minor role because the number of recognized cases is relatively low. Cases of plague due to infection with *Yersinia pestis* have been seen in approximately 40 patients each year, especially in rural areas. The most common source of human plague is contact with and consumption of the marmot (*Marmota sibirica*). Moreover, the great gerbil (*Rhombomys opimus*) and the Mongolian gerbil (*Meriones unguiculatus*) are suspected of being enzootic reservoirs. Riehm et al. (2011)<sup>17</sup> emphasize that rodents play a role as zoonotic reservoirs of *Y. pestis* and that the actual prevalence of plague seems to be underestimated. The low population density explains the low level of illness in humans.

#### Brucellosis

*Brucella melitensis* appears to be the most common species of *Brucella* isolated from blood cultures of ill patients in Mongolia. In Mongolia, transmission to humans occurs primarily from direct contact with animals through injury while handling them or during slaughtering and, to a lesser extent, from drinking contaminated milk. According to the 2003 study on emerging infectious diseases,<sup>18</sup> as of 2001, approximately 8,000 cases of chronic brucellosis were reported.

The 2016 incidence rate of brucellosis was 0.5 cases per 10,000 population. Incidence rates above the national incidence rate are in Dornod (11.6), Sukhbaatar (1.2), Arkhangai (0.9) and Kentii (0.7) Aimags.

<sup>17</sup> Riehm, Julia M. et al. (2011). *Yersinia pestis* in Small Rodents, Mongolia. *Emerging Infectious Diseases* - Vol. 17, No. 7, July 2011.

<sup>18</sup> Ebricht J.R. et al. (2003). *Emerging Infectious Diseases in Mongolia*. *Emerging Infectious Diseases*, volume 9, number 12 – December 2003.

### Tick-borne diseases

Rickettsiosis, ehrlichiosis, Lyme disease and Q fever are all tick-borne zoonoses.

According to the 2012 study, "Detection and Epidemiology of Tick-Borne Pathogens in Free-Ranging Livestock in Mongolia",<sup>19</sup> high infection prevalence of tick-borne pathogens was identified among livestock across two aimags. Differences to tick-borne exposure are observed depending on the region. Khuvsgul Aimag livestock had high seroprevalence to *A. phagocytophilum* (64 per cent) and *A. ovis* (77 per cent); Khentii Aimag livestock had a high exposure to spotted fever group *rickettsiae* species (48 per cent). These pathogens could have health effects on the animals and on human health as well.

#### Others

Occasional cases of tularemia have been reported. Animal cases of anthrax, involving cattle, sheep, and goats, are reported sporadically in the country. Occasional human cases of cutaneous or intestinal anthrax also have been reported.

Rabies remains an endemic problem, especially among dogs and wolves, with occasional human cases reported.

WHO certified that Mongolia was free of polio in 2000.

## 15.2 Health risks associated with environmental factors and environmental causes of morbidity and mortality

### Outdoor and indoor air pollution

According to the study, "Valuation of elemental concentration of particulate matter in Ulaanbaatar",<sup>20</sup> five pollution sources were identified in Ulaanbaatar (2012–2013): soil, household furnaces, power plants, dust (from building and road works) and motor vehicles.

Smoke from coal burning is presented as one of the major causes of air pollution in Ulaanbaatar. The

<sup>19</sup> Sophia, P. et al. (2012). Detection and Epidemiology of Tick-Borne Pathogens in Free-Ranging Livestock in Mongolia. *Journal of Clinical and Experimental Pathology* S3:006.

<sup>20</sup> Amgalan, N. et al. (2016). Valuation of elemental concentration of particulate matter in Ulaanbaatar, Mongolia. *Open Journal of Air Pollution*, 2016, 5, 160-169.

authorities tried to reduce air pollution produced by stoves by introducing new stoves with better burning capacity and less pollutant emissions. Ulaanbaatar Municipality also developed actions to reduce pollutant emissions, such as providing good quality coal to poor people, and installation of an electrical heating system for 1,000 households in 2012 with free electricity between 9 pm and 6 am. Major air pollutants reach their maximum concentrations during the cold season (October to April), when temperatures drop as low as  $-40^{\circ}\text{C}$ .

Annual  $\text{PM}_{2.5}$  air pollution (average nearly  $70 \mu\text{g}/\text{m}^3$ ) in Ulaanbaatar is higher than the Mongolian Air Quality Standard ( $25 \mu\text{g}/\text{m}^3$ ) and the WHO Guidelines ( $10 \mu\text{g}/\text{m}^3$ ). Air pollution causes a substantial burden of illness, mainly as pneumonia in children and cardiovascular diseases in adults (box 15.1). Exposure to air pollution during childhood may also contribute to the incidence of chronic air-pollution-related diseases later in life.

The 2016 study "Impact of air pollution on healthcare services and its cost"<sup>21</sup> estimates that 19.5 per cent of all respiratory system diseases and 23.5 per cent of cardiovascular diseases were caused by air pollution.

Air pollution places a great burden on health service provision. In 2010, estimation of the related indirect cost and economic damage of temporary loss of working ability, in relation to air pollution, was 551.4 million tugriks for respiratory system diseases and 173.9 million tugriks for cardiovascular diseases.

Based on the 2009 mortality statistics, the 2013 assessment of air pollution and its attributable mortality in Ulaanbaatar<sup>22</sup> estimated that 623 deaths in Ulaanbaatar were attributable to air pollution. This represents 9.7 per cent of the 6,426 deaths in Ulaanbaatar and, notably, 4.0 per cent of the 15,522 annual deaths for the entire country. The assessment conservatively estimated that 29 per cent (95 per cent CI, 12–43 per cent) of cardiopulmonary deaths and 40 per cent (95 per cent CI, 17–56 per cent) of lung cancer deaths in Ulaanbaatar are attributable to outdoor air pollution. However, the assessment authors underline that their estimate of attributable mortality probably underestimates the true public health burden of air pollution in Ulaanbaatar for several reasons. Indeed, the study did not take into account the indoor air pollution and the analysis was based on  $\text{PM}_{2.5}$  only, and considered mortality impacts only among those 30 years or older.

#### Box 15.1: Impact of indoor air quality on children's health

Generally, children spend over 90 per cent of their time indoors. Exposure of school-age children to air pollution depends on the time and mode of their transport to school, the school location and heating system and the time they spend at school. The three diseases that resulted in the greatest number of lost life years in 2013 were all related to air pollution.

Respiratory infection accounts for 15 per cent of deaths of children under five years old. Reducing the exposure to air pollution of children at home during early development would decrease pneumonia and impact on lung development. Thus, it is necessary to reduce exposures to air pollution for school-age children in order to decrease the impacts of air-pollution-related diseases later in life. The 2016 UNICEF report "Understanding and Addressing the Impact of Air Pollution on Children's Health" presents three main strategic goals: reduce exposure by switching to clean fuel in homes and schools, reduce incidence of pneumonia by vaccination and community care treatment, and reduce risk factors for disease, including exposure to tobacco smoke and undernutrition. There are some difficulties in controlling/limiting air pollution, such as the lack of connection between scientific evidence and policy development and limited coordination of this information between ministries and other stakeholders.

The Government took some measures to reduce air pollution in the capital, such as revision of the 2012 Law on Air, and determination of technical requirements and emission standards for air pollution sources. All these measures require equipment, technical expertise and human resources to be effective. However, some issues remain: there is no emission monitoring, no system of self-monitoring and a weak penalty system. The UNICEF report highlights that a national approach to reduce emissions and exposures is needed, involving the Government in establishing legal and regulatory frameworks, advising the public to adopt good practices and advising industry on implementing air treatment (filters, technical processes, etc.) before its release.

Source: UNICEF, Understanding and Addressing the Impact of Air Pollution on Children's Health, 2016.

<sup>21</sup> Oyuntsetseg P. (2016). Impact of air pollution on health care services and its cost. International expert consultation on understanding and addressing the impact of air pollution on child health in Mongolia. Abstract book, Ulaanbaatar, Mongolia 25-26 January 2016.

<sup>22</sup> Allen, R. W. et al. (2013). An assessment of air pollution and its attributable mortality in Ulaanbaatar, Mongolia (2013). *Air Quality Atmosphere and Health* (2013) 6:137–150.

When measured values are above the limit standards, authorities inform the population and deliver preventing messages (via TV, radio, lead screen, etc.) in order to protect public health.

There is no study on the impact of air pollution from transport or stationary sources on the health of the Mongolian population.

### Pollen

Data on seasonal fluctuations and dispersion of pollen in the air are not available.

### Indoor air pollution

There are very few data on the impact of the different pollutant sources (e.g. building materials, mould) on indoor air quality and public health. The indoor use of solid fuels for cooking is very high and contributes to the risk of acute respiratory illness, such as pneumonia and asthma, as well as cancer.

The 2003–2004 health risk assessment of indoor air quality<sup>23</sup> concluded that, among the children who were involved, 19 per cent had bronchitis, 1.4 per cent had asthma and 77.8 per cent had respiratory symptoms. Those diseases were more frequent among the children living in gers and houses. The concentrations of carbon monoxide (CO) and particulate matter (PM) were higher in gers and houses than in apartments. There was a link between CO and dust concentrations and bronchitis in children.

Monitoring of PM and CO was conducted over a 24-hour period in 65 gers under the 2005 study on the impact of improved stoves on indoor air quality in Ulaanbaatar.<sup>24</sup> In homes with different stove types, the average level of indoor concentrations of PM and CO exceeded Mongolian National Standards for 24-hour concentrations and, in the case of PM, the excess exposure was large. The indoor pollutant levels also exceeded WHO's Air Quality Guidelines.

The 2016 study on the exposure to PM<sub>2.5</sub> and blood lead levels in two populations in Ulaanbaatar<sup>25</sup> showed that women aged 40–60 years living in traditional gers with coal stoves are more exposed to higher

concentrations of PM<sub>2.5</sub> than those living in apartments with electric stoves in Ulaanbaatar. The 24-hour average concentrations of PM<sub>2.5</sub> (127.8 µg/m<sup>3</sup>) were two to three times higher than the Mongolian air quality standard of 50 µg/m<sup>3</sup>.

Stoves and other heating systems with a combustion process can be responsible for CO emissions into indoor air. As CO gas has no odour, humans cannot detect it. CO intoxication can lead to death. Cases of CO intoxication are not registered and no preventive actions are performed.

According to the 2016 study, "Pneumonia in children in Ulaanbaatar and the potential for mitigation",<sup>26</sup> the major risks factors for pneumonia are cold, malnutrition, crowding and indoor air pollution by smoke exposure. Smoke contains carbon monoxide, which has a deleterious effect during pregnancy, inducing reduction in placental blood flow leading to a reduced birth weight. Low birth weight is an important risk factor for childhood pneumonia.

Although some assessments are carried out (box 15.2), no systematic data are available concerning indoor air quality monitoring and preventive actions in schools and healthcare institutions.

### Tobacco smoke

Tobacco use is one of the major risk factors contributing to the global burden of non-communicable diseases, the leading cause of mortality in Mongolia. In 2013, the prevalence of tobacco smoking was 27.1 per cent of the total population of persons older than 15 years. It was much higher for men (49.1 per cent) than women (5.3 per cent).

### *Water pollution and sanitation*

The main source of drinking water is groundwater. However, several villages and households use surface water. Water is distributed via pipelines, water kiosks and water transportation trucks. Of water kiosks, 43 per cent are connected to a centralized water supply system, 43.9 per cent are not and 13.4 per cent are supplied by water transportation trucks.

<sup>23</sup> Ministry of Health (2003-2004). Health risk assessment of indoor air quality. Ulaanbaatar-Mongolia 2003-2004 – MOG/HSE/4.3/001.

<sup>24</sup> Cowlin, S. C., Kaufmann, R.B., and Edwards, R. (2005). Impact of Improved Stoves on Indoor Air Quality in Ulaanbaatar, Mongolia. Energy Sector Management Assistance Program.

<sup>25</sup> Enkhbat, U. et al. (2016). Exposure to PM<sub>2.5</sub> and blood lead level in two populations in Ulaanbaatar, Mongolia.

International Journal of Environmental Research and Public Health, 2016, 13, 214.

<sup>26</sup> Mullholand, K. (2016). Pneumonia in children in Ulaanbaatar and the potential for mitigation. International expert consultation on understanding and addressing the impact of air pollution on child health in Mongolia. Abstract book, Ulaanbaatar, Mongolia, 25-26 January 2016.

### Box 15.2: Hygienic and sanitary conditions and the indoor air quality of schools

In recent years, both ambient and indoor air pollution have become among the most pressing environmental health problems in Mongolia. In 2016, the Ministry of Health and the National Centre for Public Health carried out a UNICEF-funded assessment of hygienic and sanitary conditions and the indoor air quality of schools. The study was carried out at three schools in Sukhbaatar, Chingeltei and Songinokhairkhan districts of Ulaanbaatar, where the level of air pollution is the most serious, and in another three schools in the Khan-Uul District of Ulaanbaatar, which is less affected by air pollution.

About 10 indicators, including observation, laboratory analysis and air quality measurements, were used to assess and estimate the risk that ambient environment and conditions at school pose for the health of the school children. Among these indicators, only three – natural daylight in classrooms, quality of cleaning and its frequency, and separation of classrooms for primary school students – met the requirements. The other indicators – floor space per child, suitability of desks and chairs to a child's age and body, classroom microclimate, and indoor air quality – did not comply with the standards.

The main findings of the assessment included:

The schools were generally overcrowded and operating above their capacity. For 38.8 per cent of all schools, the floor space per student is 2.8 times smaller than the required standard of 1.5 m<sup>2</sup> per child, while for 22.2 per cent of the assessed schools the number of students per classroom exceeded the maximum allowed level.

School furniture such as desks and chairs did not meet the national standard MNS 3213:1987. These items were too small or too narrow for the child's age and body.

The microclimatic indicators, such as classroom temperature and air humidity, did not meet the national hygiene standard. Air temperature of the sampled classrooms exceeded the norm (air temperature 17–20°C) by 2–3.6°C. In addition, in 40.3 per cent of all sampled classrooms, the average room humidity was lower than the norm (30–50 per cent humidity).

The average CO<sub>2</sub> concentration was 3,148.9 µg/m<sup>3</sup> for all the sampled schools, which is 1.6–1.8 times higher than the approved standard. A high level of CO<sub>2</sub> in classrooms correlated with other factors, such as insufficient ventilation, classrooms having too many students and insufficient floor space per child.

PM<sub>2.5</sub> concentration was 3.1–10.05 times higher than the national standard on air quality. PM<sub>2.5</sub> concentration was highest in sampled schools of Sukhbaatar and Songinokhairkhan Districts, an area which is associated with high air pollution from heat-producing boilers and dense habitation of the ger areas.

The overall results of the study showed that 20–70 per cent of children's health and intellectual aptitude are directly influenced by their school environment, including hygienic and sanitary conditions and other surrounding factors.

*Source:* National Centre for Public Health, Assessment of the Hygienic and Sanitary Conditions and the Indoor Air Quality of Schools, 2017.

According to the United Nations MDG database, in 2010, 63 per cent of the Mongolian population (69 per cent in urban areas and 50 per cent in rural areas) used improved drinking water sources (table 9.12). In 2015, improved drinking water sources were used by 64 per cent of the total population (66 per cent in urban areas and 59 per cent in rural areas). In 2015, 40 per cent of Mongolia's population did not use improved sanitation facilities (table 9.12). The proportion of the population without access to improved sanitation was 34 per cent in urban areas and 57 per cent in rural areas in 2015.

Strong differences were observed by region. The lowest access is observed for the western region, with 35.2 per cent of the population having access to safe drinking water in 2010. In addition to the lack in access to safe drinking water, 95 per cent of the population living in the western region in 2010 had no access to improved sanitation, compared with 62 per cent of the population of Ulaanbaatar region.

To improve access to water, sanitation and hygiene (WASH) in schools, dormitories and kindergartens, UNICEF Mongolia has developed a WASH facility in a container, which can be connected to a building or a ger. The containers are equipped with flushing toilets, urinals, washbasins and a shower room and each can serve 30–60 students. The containers, introduced in 2014 and installed in Khuvsgul Aimag and Nalaikh District, have served about 1,400 children. In schools, the containers have had a positive effect on children's hygiene and behavioural outcomes, helping to create healthy, child-friendly learning environments.

The lack of sufficient availability of drinking water and sanitation and the bad quality of drinking water are the major causes of risk of intestinal infectious diseases. Diarrhoeal diseases, including dysentery, typhoid and other diseases, are one of the causes of morbidity.

A sanitation protection zone is organized around springs to protect them against pollution and quality



degradation. A zone consists of a 50–100 m diameter circle around the spring, depending upon its flow rate. However, in several cases, the protection zone is not well defined and implemented and pollution sources can be present.

The Healthy Springs in Mongolia project, implemented in Ulaanbaatar City and 21 aimags during the period from March 2004 to September 2006, revealed that the majority of springs in peri-urban areas close to Ulaanbaatar City and in the central region had poor hygienic conditions. Most of the springs studied (127 springs, 99 from rural areas and 28 from Ulaanbaatar City) during 2004 have not had any protection and upgrading of their surrounding area. As a result of the project implementation, in 2006, 28 springs were protected and upgraded in 19 aimags and Ulaanbaatar City. Training sessions entitled "Launch of the project Healthy Springs in Mongolia" and "Spring water quality and its protection" were also organized in 2004 and 2005 in Ulaanbaatar and Darkhan-Uul Aimag. Their purpose was to improve participants' knowledge and skills on prevention of water-related health issues, change community behaviour, introduce proper water treatment at the household level and design means of protection and upgrading of spring and other drinking water sources. The Government also launched protection of springs; as of 2016, 2,299 springs were protected (figure 9.1).

In 2012, drinking water quality analysis conducted by GASI on 602 water samples showed that ammonium concentration exceeded the standard norm in 1.5 per cent of samples and bacterial concentration exceeded the standard norm in 10.1 per cent of samples, with *E. coli* concentration non-compliance for 4.8 per cent of the samples. Water quality monitoring in 218 soums confirmed these results: concentration of ammonium was above maximum allowable concentration (MAC) in 0.8 per cent of samples and bacterial concentrations exceeded MAC in 19.6 per cent of samples, with *E. coli* identified in 9.6 per cent of samples. It should be emphasized that monitoring coverage in soums varied between 30 and 100 per cent, depending on the aimag, except for Khentii (17 soums) and Bayankhongor (20 soums) Aimags, where no drinking water monitoring was performed in 2012. In 2015, in accordance with bacteriological indicators, 12.8 per cent of centralized and 28.1 per cent of decentralized water supply sources did not meet the drinking water quality standards.

Groundwater in the Gobi Desert and southern region has high concentration of mineral content and high hardness. Calcium, magnesium, chloride and sulphate ion concentrations in the drinking water of 80 soums exceed the corresponding Mongolian National Standards and could affect public health in the region.

In 2005, arsenic concentration in drinking water exceeded the standard (0.01 mg/l) in 10.3 per cent of the total samples; the highest value was found in Tuv Aimag (0.05 mg/l).

GASI performed a survey in Gobi Aimag in 2013. The results showed that, in water samples from 142 wells in 63 soums, silver concentration in the water of 19 soums was 12–81 times higher than the Mongolian standards, arsenic in the water of 16 soums was 1–6 times higher, chromium in the water of one soum was 2.6 times higher, iron in the water of six soums was 27–728 times higher, manganese in the water of seven soums was 17 times higher and lead in the water of four soums was 40 times higher. These high concentrations of metals can affect public health.

In several areas, water is collected from the city/central wells or a water kiosk by the inhabitants and transported and stored in inadequate containers, which could release chemical compounds and favour microbial development. The report "Profile of Water Safety 2010–2015" states that 55.2 per cent of household water samples were bacteriologically polluted and, according to responses to the questionnaire, most households stored drinking water in inappropriate containers and washing and disinfection were unsatisfactory. Lead was detected in surface water around mining areas but also in stored drinking water. In addition, a 2015 study on the impact of the environment on health in Mongolia<sup>27</sup> reported high levels of lead in water stored in inappropriate containers, such as oil containers or plastic containers. Based on the 2014 analysis of the situation of children in Mongolia, water is commonly collected by an adult male; however, 31 per cent of women and 11 per cent of children under 15 also collected water in 2010. Carrying heavy loads contributes to the development of back and spinal injuries, especially when carrying out repetitive actions and during childhood.

Information on bottled mineral water and data on bottled water quality monitoring are not available.

<sup>27</sup> Jadambaa, A. et al. (2015). The impact of the environment on health in Mongolia: a systematic review. *Asia Pacific Journal of Public Health*, vol. 27(1) 45-75.

*Bathing water*Bathhouses, inland bathing, swimming pools and hot springs

No comprehensive and regular data are collected concerning water quality in bathhouses, inland bathing, swimming pools and hot springs.

In October 2017, the Central Laboratory of the State Inspection of Ulaanbaatar City conducted water sampling which covered 11 swimming pools and 12 hot and cold baths of 13 economic entities located in five districts of the city. Chlorine residue and infectious microorganisms were analysed, based on the microbiological analysis standard MNS 6186:2010 and bacteriological and chemical analysis standard MNS 7793–3:2008. Results showed that, for chlorine content, 56 per cent of the samples were below the allowed norm. Infectious microorganisms that are resistant to broad-spectrum antibiotics were present in 68 per cent of water samples from the tested baths.

Legionellosis prevention

Legionellosis incidence is not registered. Thus, legionellosis prevention actions are not conducted. However, Mongolia has potential sources that could favour legionella development, such as the hot water network, air-conditioning systems and hot water springs. No data are available from any study of legionella detection, so it is difficult to determine whether it is a public health issue.

*Radiation*

Background radiation measurements are performed twice a day at 39 radiation monitoring stations. No data on the impact of radiation on health are reported.

Medical radiation

There were no data and no information available on how accidental radiation exposure is prevented, declared and collected.

Electromagnetic fields and ultraviolet radiation

Electromagnetic fields are not measured and no specific prevention action is performed for vulnerable buildings, such as schools and healthcare centres.

In Mongolia, the UV index is estimated to be high (6–7) in May, June and August and reaches a very high

level (8) in July. No specific data are available on the impact of UV on the health of the Mongolian population.

*Noise*

No data are available concerning the impact of noise and vibration on human health. Despite traffic jams observed in Ulaanbaatar and noise around mining activities, this environmental factor is not taken into account, though its negative impact on public health is well known.

Noise quality standards are available. In the daytime (7 am to 10 pm), the permissible limit is 60 dB; at night (10 pm to 7 am), the permissible limit is 45 dB.

*Chemical safety*

Several cases of methanol poisoning, caused by bad alcohol products, were observed. In January 2017, alcohol selling and distribution was temporarily banned in response to one death and four hospitalizations due to methanol poisoning.

Waste and polluted soil

In urban areas, soil pollution is mainly bacteria pollution from ger district sanitation facilities (latrine and wastewater), while rural soil pollution is mainly from mining waste and discharges. Areas surrounding processing factories, car repair shops and waste collection points have a high content of heavy metal pollutants such as lead, chrome and zinc.

GASI assessed soil pollution in residential areas throughout the country in 2014. Results showed that bacterial contamination in Ulaanbaatar was characterized as minimal or moderate, depending on the bacteria strain and on the location. However, microbial contamination was characterized as highly contaminated for 27 per cent of the aimag samples (120 samples) and 43 per cent were uncontaminated. In Ulaanbaatar, heavy metal testing showed that concentrations of lead, cadmium and mercury in 58 samples were within the Mongolian norms (MNS 5850:2008).

According to the 2010 study "Assessment of Metals Contamination of Soils in Ulaanbaatar" and the 2011 study on soil pollution with heavy metals in the industrial cities of Mongolia (Ulaanbaatar, Darkhan and Erdenet),<sup>28</sup> heavy metals such as Pb, As, Cr, Hg, Cu, Ni, Zn and Mo were found in Mongolian soil,

<sup>28</sup> Tserennyam, B. et al. (2010). Assessment of metals contamination of soils in Ulaanbaatar, Mongolia, Journal of

Hazardous Materials, Volume 184, Issues 1–3, 15 December 2010, 872–876. Kosheleva, Natalia E. et al.

especially in industrial cities. Pollution by heavy metals comes from different sources, such as tanning production, mining activities, traffic zones and heat and power engineering.

No database is available on the location and characterization of polluted soil in Mongolia.

#### Persistent organic pollutants

POP pesticides have never been produced in Mongolia, but are imported. A preliminary inventory was conducted in 2004–2005 and concluded that low volumes of POP pesticides were used. However, inadequate conditions of application, storage and utilization of obsolete transformers and pesticides can result in pollution of the environment and increased health risk for the population due to their exposure to PCBs and pesticides.

UNIDO estimated that 2,300 tons of PCBs existed in Mongolia in 2013. A plant to decontaminate transformer oils and safely dispose of PCBs was established in Mongolia, which is able to treat 1,000 tons in 18 months.

The 2011 study on POPs (PCBs and organochlorine pesticides (OCPs)) in air and soil from Ulaanbaatar and the Lake Hovsgol region<sup>29</sup> was conducted on PCB and OCP levels in air and soil samples from Ulaanbaatar and its residential suburb Yargayat-bogino, and in Tarialan Soum in Hovsgol Aimag. The health impact was also estimated by risk evaluation methodology on inhalation of atmospheric air and accidental ingestion of soil particles. Concentration levels in soil and air are lower than MAC. The carcinogenic risk factor for the average population exposed to POPs in soil and air equals 1, which means the usual everyday carcinogenic risk factor. The non-carcinogenic risk factor resulting from population exposure to POPs in soil and air is lower than 1 by an order of 2–4.

#### Industrial releases

The tannery industry is a user of chemical compounds such as chromium and it also uses a large amount of animal products. The 2015 study by Jadambaa et al. on the impact of the environment on health in Mongolia emphasized that occupational exposure of parents to chromium has had an impact on children's health in the early stages of life.

(2011). Soil pollution with heavy metals in the industrial cities of Mongolia. *Mongolian journal of biological sciences* 2011 Vol.9(1-2):39-45.

Untreated industrial wastewater from factories, tanneries and mining sites pollute Mongolian rivers. No data are available concerning compounds and volumes of industrial releases, and no evaluation of their impacts on the environment (air, soil, and water) and health is conducted.

#### Medical waste

More than 90 per cent of healthcare facilities burn healthcare waste, but healthcare incinerators do not comply with hygiene standards and have no filter. Centralized collection, disposal and treatment of healthcare waste was introduced in 2009 in Ulaanbaatar. Small-scale autoclaves for healthcare waste disinfection were provided to 151 soum hospitals in 21 aimags by various projects between 2010 and 2013 (chapter 10).

The country is committed to ending the use of mercury in medical materials. The Mercury-free Hospital Initiative was successfully rolled out. In 2012, 14 hospitals were announced to be mercury free. Procurement of mercury-containing thermometers, sphygmomanometers and dental amalgams was banned, effective from January 2011.

Individual medical waste from households is not collected.

#### *Housing and human settlements*

#### Asbestos

Industries started using asbestos as a component of thermal insulation and construction material in power plants, metal processing and construction in 1961. Mongolia imported 35,484 tons of asbestos between 1995 and 2010. Asbestos cement was very popular in the construction of buildings in the 1960s, 1970s and 1980s. Many of these buildings are in disrepair, exposing unprotected workers and the population to asbestos.

Asbestos exposure occurs when asbestos is used in inappropriate conditions or released by material deterioration, or building degradation or destruction. People could also be exposed to it when their family members are occupationally exposed and carry asbestos fibres home on their clothes.

<sup>29</sup> Mamontova, E. A. et al. (2011). Persistent organic pollutants (PCBs and OCP) in air and soil from Ulaanbaatar and the Lake Hovsgol region, Mongolia. *Mongolian Journal of Chemistry*, 12-38-2011 69-77.

The 2016 Environmental Health Profile indicates that several actions were implemented and a report on asbestos use was produced in that year. However, this work on asbestos stopped and the objectives dealing with development of standards and regulations, a control system and disease registration were not implemented. The asbestos testing laboratory was established at the National Centre for Public Health but is not functional today.

There are currently no standards for asbestos exposure and no policy for detection of asbestos in buildings before demolition.

Asbestos exposure and related diseases are not monitored or registered. No monitoring of the presence of asbestos fibre is carried out in public buildings such as schools or medical centres.

According to the 2015 study on mesothelioma in Mongolia, one case of mesothelioma caused by occupational exposure to asbestos was reported. Due to the use of asbestos, additional cases of asbestos-related diseases could be identified in the future.

### Radon

Exposure of the population to radon is a cause of lung cancer and there is an enhanced effect with tobacco smoke. Radon concentrations were measured indoors (in concrete, brick, wood and gers) and in outdoor air during winter (November and December) over six years (1999–2005).

According to the 2008 study on annual doses of radon in Mongolia,<sup>30</sup> radon concentration in outdoor air (in winter) was 18.7 (2.3/38.8) Bq/m<sup>3</sup> and in indoor air was 26.0 (8.2/42.6) Bq/m<sup>3</sup>. Radon concentration was higher in concrete (41.9 Bq/m<sup>3</sup>) and brick (36 Bq/m<sup>3</sup>) buildings than wooden buildings (19.1 Bq/m<sup>3</sup>) and gers (10.1 Bq/m<sup>3</sup>). The radon dose rate received by humans was estimated at 0.8 (0.33/1.26) mSv/year. This concentration is less than the maximum effective dose (2.5 mSv/year).

### Lead

In Mongolia, leaded gasoline was banned in 2008. Consequently, the contribution of traffic to lead

concentration in air has diminished strongly since 2008. However, lead is released into air during coal combustion for heating in the winter and for cooking, and contributes to the deleterious health impact of polluted air on the population.

The 2014 study "Assessment of Blood Lead Levels and Associated Risk Factors Among Children in Ulaanbaatar"<sup>31</sup> shows a decrease in children's blood lead level (5.3 µg/dl) compared to blood lead level (16.5 +/-9.5 µg/dl) measured in a 2005 study. This decrease was attributed to the ban on leaded gasoline in 2008. Of the 153 children tested in Ulaanbaatar schools, 69.3 per cent had a blood lead level superior or equal to 5 µg/dl. Adverse health effects start to occur at a blood lead level less than 10 µg/dl in children.

A 2016 study, "Exposure to PM<sub>2.5</sub> and Blood Lead Level in Two Test Groups in Ulaanbaatar",<sup>32</sup> shows that the geometric mean blood lead level of a population of Mongolian women aged 40–60 years living in Ulaanbaatar was measured at 3.1 µg/dl. However, no statistically significant difference in blood lead levels was observed between women living in gers and in apartments, suggesting that lead exposure comes from several sources and not only from polluted air resulting from coal combustion.

Several studies demonstrated that the Mongolian population is exposed to lead in concentrations that can have health impacts. However, there is a lack of data concerning the different sources of lead exposure, such as lead in paint and in toys, lead and occupational exposure, and lead in dust and soil, and their impact on the health of the Mongolian population.

### Mould

There are no reported data on allergy symptoms in relation to mould. Mongolian air is very dry and not favourable for mould development. However, bad household conditions can favour mould development. In houses that do not have adequate humidity control and ventilation, cooking and heating habits can lead to mould development.

<sup>30</sup> Batjargal, E., Bandisuren, M., and Battogtvor, E. (2008). Annual dose from radon in Mongolia. Proceedings of IRPA12: 12. Congress of the International Radiation Protection Association: Strengthening Radiation Protection Worldwide - Highlights, Global Perspective and Future Trends-IAEA-19-24 October 2008- Argentina.

<sup>31</sup> Meredith L. Praamsma et al. (2016), Assessment of Blood Lead Levels and Associated Risk Factors Among Children

in Ulaanbaatar, Mongolia, Central Asian Journal of Medical Sciences, 2016 Nov 2(2): 195-205.

<sup>32</sup> Enkhbat, U. et al. (2016). Exposure to PM<sub>2.5</sub> and blood lead level in two populations in Ulaanbaatar, Mongolia. International journal of environmental Research and Public Health, 2016, 13, 214.

*Occupational health and safety*

The occupational diseases surveillance data from 1990 to 2000 indicated that work-related lung disease, chemical poisoning and neurological disease are the top three causes of occupational morbidity. Industrial growth heightens the number and intensity of hazardous work exposures, as well as worker vulnerability to these hazards. Workers are at risk of occupational exposure to arsenic, chromium, silica, asbestos and polycyclic aromatic hydrocarbons.

Occupational cancer may occur in selected small populations, but the risk is very high. This type of cancer is preventable through education, information and legislative measures to protect workers. Currently, there is no system for monitoring occupational carcinogens and no reliable data available on occupationally related cancer (lung cancer, leukaemia and malignant mesothelioma).

According to the 2012 UNICEF Labour Force Survey with Child Activities Module, 9.6 per cent of children aged 5 to 17 perform child labour – 17.8 per cent in rural areas and 2.8 per cent in urban areas. Children work particularly in the agriculture sector, but also in horse racing, construction and mining. Hazardous work is common in construction and mining, with more than half of 15- to 17-year-olds in these sectors performing such work. In rural areas, 96 per cent of working children are engaged in agriculture. Most children herd for other families and do not have a formal work contract.

According to the 2016 ILO Policy Brief on child labour in Mongolia, in 2016, more than 10,000 children were registered as child jockeys. From 2012 to 2014, 326 child jockeys received emergency medical treatment after suffering falls and 18 children died. Child labour in the construction sector is most prevalent in urban areas. In 2015, most of the children working in construction were boys and had begun work aged 15–18. They did not have a written contract, many were not equipped with proper safety equipment and almost half of them suffered injuries at work.

Some children work in the mining sector in hazardous, polluted and/or noisy environments. Safety equipment is used only occasionally and over half of them suffered accidents at work.

*Mining activities*

Health hazards related to mining include dust-related respiratory diseases and chemical poisoning. The main impacts are encountered in mining sites closed to residential areas and in artisanal mining using chemicals and with bad working conditions. Impact assessment of mining activities on human health is not conducted.

In response to economic transition and climatic disasters that caused widespread poverty and unemployment, several miners have turned to artisanal and small-scale gold mining in an attempt to improve their situation. The number of artisanal miners was estimated to be 100,000 in 2010. One of the main problems for the environment is amalgamation, a technique that uses mercury to extract gold from ore. Gold is recovered by heating the amalgam (mercury plus ore) in smelters until the mercury is vapourized in air. The mercury used to extract gold from ore is discharged into the environment (in water, soil and air), where it poses a hazard for human health (box 15.3). When amalgam is smelted inside (a ger or house), mercury fumes pollute the indoor air. Mercury is highly toxic; it affects the nervous system and can cross the blood placenta barrier.

In 2008, the Government prohibited the use of mercury.

Mining activities and coal combustion can be responsible for the enrichment of heavy metals in the environment. Various studies on arsenic contamination of ground, surface, waste and drinking water in north-central Mongolia revealed elevated levels of arsenic.

According to the study "Investigating Arsenic Occurrence and Sources in Ground, Surface, Waste and Drinking Water in Northern Mongolia",<sup>33</sup> the highest concentration of arsenic was detected in the effluent of a gold mine (up to 2,820 µg/l) and in the ash basin of a thermal power plant (up to 1,170 µg/l). In addition, five of 54 drinking water samples and 16 of 184 river samples were found to contain arsenic levels above the WHO recommendation of maximum permissible limit (10 µg/l), with a maximum of 300 µg/l of arsenic.

<sup>33</sup> Pfeiffer, M., Batbayar, G., and Hofmann, J. et al. (2015). Investigating arsenic (As) occurrence and sources in

ground, surface, waste and drinking water in northern Mongolia. *Environmental Earth Sciences* 2 73: 649.

**Box 15.3: Impact of mercury use on human health in gold mining area**

A 2011 environmental epidemiological study on mercury exposure in female artisanal gold miners was conducted to determine the mercury burden on female gold miners. It concluded that female miners presented the highest body concentrations of mercury. However, female miners were not the only contaminated population, as women not engaged in mining but living in the mining area also presented high mercury concentrations.

In April 2007, a chemical incident involving the release into the environment of large quantities of mercury and cyanide from gold mining activities occurred in Khongor Soum. This incident has raised serious concern among the local population regarding the potential health effects that might result from this environmental contamination. Tests conducted on the population by WHO indicated that the local population of Bornuuar Soum and Tal Bulag Bagh in Jargalant Soum has been exposed to mercury. Long-term mercury exposure in Bornuuar and Jargalant Soums did and does damage the health of the inhabitants living in the area, and damaged the health of people working directly with mercury to an even greater extent.

The findings of the 2015 study, Toxicity assessment in artisanal miners from low-level mercury exposure in Bornuur and Jargalant Soums of Mongolia, correlates with these conclusions. The study indicates that low-level mercury exposure caused symptomatic central nervous system toxicity associated with chronic exposure to mercury in Bornuur and Jargalant Soums.

Source: Stecling, N. et al. (2011). Mercury exposure in female artisanal scale gold miners (ASGM) in Mongolia: an analysis of human biomonitoring (HBM) data from 2008. *Science of the Total Environment* 409 (2011) 994-1000; Duvjir, S. et al. (2015). Toxicity assessment in artisanal miners from low-level mercury exposure in Bornuur and Jargalant soums of Mongolia. *International Conference on Environmental Forensics 2015*.

**Photo 15: Watering the road in a mining area, Zaamar Soum**

Dust is one of the impacts of mining activities, especially in coal-mining areas. The main contributing sources of dust in mining regions include mining truck movements and mine stockpiles. Companies are

required to perform air quality monitoring in and around sites and to inform the population and local authority when Mongolian National Standards are exceeded. Data collected are not published. However,

in Tavan Tolgoi area, one mine publishes dust monitoring results.

Mining-generated dust particularly affects herders who live close to mine sites and along transport roads. Prolonged dust exposure affects the health of inhabitants and herders' families, livestock health and rangeland quality. Herders report increases in allergies, coughing and difficulties in breathing since mining started. However, no specific scientific research is conducted to confirm this link. Herders have to travel further with their livestock to find rangelands not affected by dust.

According to the Sustainable Minerals Institute's report "Responsible Mining in Mongolia: Enhancing Positive Engagement" (2015), the perceived impacts of mining on the quality and quantity of water resources vary by region, depending on the type of mining and local water context. For herders, mining activities have a deleterious impact on drinking water quality and lead to the presence of toxic substances such as mercury and cyanide in water and the food chain. However, scientific studies to demonstrate the impact of mining on water quality and quantity are not conducted.

### 15.3 Health risks associated with food safety and nutrition

#### *Food security*

Based on national consumption of 13 food groups, the national demand for food in 2015 was estimated at 176,500 tons of meat and meat products, 132,500 tons of milk, 176,500 tons of dairy products, 88,300 tons of flour, 194,200 tons of flour products, 68,900 tons of rice, 20,300 tons of sugars and sweeteners, 123,600 tons of potato, 176,500 tons of vegetables, 79,600 tons of pulses, 158,900 tons of fruits and berries, 16,700 tons of eggs and 22,000 tons of edible oil. Annual food demand for the standard population increased by 200 tons (oil, eggs and sugars) to 2,100 tons (flour products), compared with 2014. In 2015, domestic production was enough to satisfy 97.1 per cent of the standard population's annual demand for meat and meat products, 90.6 per cent for potatoes, 91.3 per cent for flour and flour products and 62.7 for vegetables.

The national average daily dietary calorie intake per standard person in 2016 was 2,709.2 kcal in summer and 2,599.8 kcal in winter. These values are higher than the recommended daily calorie intake: 2,000 kcal for a woman and 2,500 kcal for a man.

Despite Mongolia having a vast territory with abundant natural resources and a large number of

livestock, as well as plenty of unused arable land, the country faces challenges in the agriculture, food and natural resource sectors, mostly because of declining soil fertility, inefficient livestock management and high-impact natural disasters related to climate change.

#### *Nutrition*

A high level of micronutrient deficiencies persists. The food basket of an average Mongolian is characterized by the dominance of flour and meat products and a negligible amount of vegetables and fruits. This lack of essential vitamins and minerals in diets cause irreversible developmental complications, especially for children. Vitamin D deficiency in Mongolian children under 5 years old stands at 61 per cent, with a high prevalence in the eastern, western and highlands regions and Ulaanbaatar. Also, 26.6 per cent of children and 21.4 per cent of pregnant women are anaemic. Iron deficiency in children under 5 years old is also very high, at 10.9 per cent.

In 2013, 12 per cent of the adolescent population were overweight and 2 per cent were concerned by obesity. Between 2000 and 2010, the prevalence of underweight children fell from 11.6 per cent to 3.3 per cent, the prevalence of stunting has declined from 29.9 per cent to 15.3 per cent, and the prevalence of wasting from 7.1 to 1.6 per cent. However, the prevalence of underweight children aged 0–6 months increased from 6.9 per cent in 2005 to 8.4 per cent in 2010. In 2014, low birth weight was more common in rural areas (particularly the western region, at 6.6 per cent) than in urban areas (3.8 per cent in Ulaanbaatar).

#### *Food safety*

Control and inspection of food products are performed on raw materials, foodstuffs and other food materials. A first list of banned and limited use toxic and hazardous chemicals was approved by the Government in 1997. This list was renewed in 2007. Successively, in 2008, 2010, 2011 and 2012, new chemicals were added to the list. As of 2016, 126 chemicals are banned and use of 31 chemicals are in limited use in Mongolia. A licence is issued for chemical use.

In 2016, there were 18 entities certified according to ISO 9001 (Quality Management Systems). As of 2016, five certificates for ISO 22000 (Food Safety Management Systems) were issued in Mongolia.

Companies have to perform self-monitoring for food safety and hygiene. Self-monitoring is controlled during inspection.

In 2015, GASI inspected 31,847 food-related facilities (6,897 business entities and 24,950 individual entrepreneurs). Of these, 68 entities and 66 individual entrepreneurs had their activities suspended. GASI identified 29,869 cases of violation, 79.1 per cent of which were removed or resolved. The main violations concerned violations of norms and standards for building and facilities (20 per cent), violations of hygiene and sanitary norms and standards (19.1 per cent), violations of norms and standards for storage and transportation (13.2 per cent), and violations of standards for raw material, preparation, quality and safety of final food product (9.9 per cent). The violation eradication rate varied from 77 to 84 per cent, depending on the violation type (average 79 per cent).

In 2016, GASI inspected 7,857 food-related facilities (4,785 business entities and 3,072 individual entrepreneurs). The activities of 119 entities and 44 individual entrepreneurs were consequently suspended. The number of violations identified by GASI reached 27,488, 77.6 per cent of which were resolved. The main violations identified in the previous year remained steady in 2016: violations of norms and standards for building and facilities (18.2 per cent), violation of hygiene and sanitary norms and standards (18.3 per cent), violations of norms and standards for storage and transport (13.2 per cent), and violations of norms and standards for raw material, preparation, quality and safety of final food product (10.5 per cent). The average violation eradication rate was 81.4 per cent, varying from 68.7 to 94.1 per cent.

The number of inspections performed for individual entrepreneurs decreased sharply in 2016 (3,072 inspections), compared with 2015 (24,950 inspections). The proportion of suspended activities increased in 2016, for both inspected entities and individual entrepreneurs (25 and 14.3 suspensions per 1,000 inspections), compared with 2015 (10 and 2.6

suspensions per 1,000 inspections). Measures taken for non-compliance vary from warning to penalties or suspension of activity. GASI makes recommendations and trains enterprise staff in order to remove the violation and improve practices.

Foodstuff analysis is performed in 65 accredited food-testing laboratories on microbiological and chemical indicators.

#### *Food-borne disease*

In 2016, 12 food-borne disease outbreaks were reported, affecting 382 persons in total. Of these, 127 persons (33.2 per cent of affected people) were hospitalized; no case of mortality was reported (table 15.4). The significance of a food-borne disease outbreak depends on the number of people exposed to the contaminated food and to the nature of the contaminant.

Morbidity related to bacterial food poisoning remains high. Twelve per cent of all cases in 2012 were in rural areas, but this rose to 49 per cent in 2013 and 57 per cent in 2014, before falling to 22 per cent in 2015 and 10 per cent in 2016 (table 15.5).

#### *Healthy diet*

In 2012, WHO and the National Centre for Public Health carried out a project on food availability (The School Food Environment in Ulaanbaatar, Mongolia: An Analysis of Food Advertising and Availability). It showed that unhealthy food advertisements were highly prevalent around schools. A total of 1,459 advertisements displaying branded food products and 501 promotions displaying unbranded food products were identified in the area around 30 selected schools. Children's exposure to unhealthy food advertising makes unhealthy products the preferred choice among school children.

**Table 15.4: Food-borne disease outbreaks: persons affected and hospitalized, 2012–2016, number**

	2012	2013	2014	2015	2016
Outbreak of food-borne illness	3	5	11	6	12
Affected people	572	93	766	311	382
Patient hospitalized	5	1	244	33	127

Source: National Statistics Office, Indicators for Food Security Statistics, 2015 and 2016.

**Table 15.5: Morbidity cases related to bacterial food poisoning, 2012–2016, number**

	2012	2013	2014	2015	2016
<b>Total</b>	<b>719</b>	<b>238</b>	<b>548</b>	<b>482</b>	<b>430</b>
Urban areas	633	121	235	375	366
Rural areas	86	117	313	107	44

Source: National Statistics Office, Indicators for Food Security Statistics, 2015 and 2016.



## 15.4 Climate change and human health

### *Current situation*

The First Assessment Report on Climate Change was published in 2009. Since 2009, progress has been made in assessing climate change impacts, vulnerabilities and associated risks. The 2014 Second Assessment Report on Climate Change provides deeper analysis and introduces a chapter on climate change impacts on society and the economy, taking into account the impacts on human health and well-being.

The 2014 Report reviewed several health studies performed in Mongolia in relation to climate change. It refers to a 2009 climate change and health study that showed a correlation between cardiovascular diseases morbidity and the number of hot days in Ulaanbaatar. A relationship between several infectious diseases (tuberculosis, typhoid, viral hepatitis A, dysentery, plague, tick-borne encephalitis) and climate parameters such as temperature and precipitation was also demonstrated. Another study on climate change and health was conducted between 2010 and 2012 on four different climate zones. It demonstrated that vector-borne diseases were influenced by climate change. Tick proliferation and mosquito reproduction were favoured by climate change (warming) and, with them, development of vector-borne diseases.

In the winter 2009–2010, a dzud ravaged the country, which was the worst of its kind in recent history (chapter 14). The Government declared disaster status in 15 aimags. During the 2009–2010 dzud, about 8.5 million livestock died, approximately 20–25 per cent of the country's livestock population, and this affected 769,000 people. A 35–40 per cent increase in mortality of under-5-year-olds was observed in areas affected by the dzud. Increased acute and chronic malnutrition, micronutrient deficiencies among pregnant women, a lack of access to health care, widespread food insecurity, the loss of livelihoods and severe psychological trauma among herders and their families were also observed.

Climate events also have social and psychological impacts, such as suicide and psychic symptoms. Having suffered natural disasters such as drought and dzud, herders increasingly migrate to cities, particularly Ulaanbaatar. Mongolia also suffered dzuds in three consecutive years between 1999 and 2002. The livestock sector experienced losses and living standards of herder households declined, drastically increasing poverty and unemployment in the aimags. Lack of access to improved water and sanitation facilities is likely to put poor people at

greater risk of infectious diseases. Lack of access to health services in remote rural communities is likely to put certain vulnerable groups, such as pregnant women during the prenatal and neonatal stages, infants and the elderly, at greater risk.

Climate change is expected to exacerbate seasonal food insecurity. More frequent dzuds will lead to more livestock deaths. In addition, climate change has an impact on agricultural practices (irrigation), rangeland quality, and animal concentration in certain places because of water availability.

### *Climate change adaptation*

The 2014 Second Assessment Report on Climate Change underlined challenges in the agricultural and water sectors. It suggested that cultural practices and technologies should be modified to take climate change into account. It highlighted that the water sector will be a key sector, especially for areas with poor water resources, where people's livelihoods would be greatly affected.

## 15.5 Legal, policy and institutional framework

### *Legal framework*

The 2011 Law on Health defines the state policy on health and its basic principles, as well as the organization of the health system and responsibilities of governmental bodies at various levels.

The revised 2016 Law on Hygiene describes the responsibilities of the authorities at national and local levels to monitor and ensure hygienic conditions concerning water, air, soil and waste management. This Law also introduces hygiene requirements for urban planning and construction. The Law requires that business entities with 50 or more employees employ a health and labour safety officer. The Law includes a notion of health impact assessment. Health impact assessment is to be organized in accordance with relevant provisions of the 2012 Law on Environmental Impact Assessment (chapter 2) as amended in 2016. Implementation of health impact assessment has not yet begun.

The revised 2012 Law on Air regulates ambient air protection, pollution prevention, mitigation of air pollutant emissions and their control (chapter 8). The Law describes obligations to protect the population against adverse effects of air pollution on human health. It requires that air quality information and health impact advice are provided to the population.

The 2005 Law on Tobacco Control was last revised in

2015. All tobacco products must carry health warnings and messages covering at least 50 per cent of the packaging. Smoking in public places and public transport facilities, including outdoor areas, parks and playgrounds, is forbidden.

Radiation protection and safety are regulated by the 2009 Law on Nuclear Energy.

The 2001 Law on Radiation Protection and Safety Radiation regulates the safety of medical personnel and patients. According to the Law, the instruments or equipment used for diagnosis or radiotherapy shall be calibrated and under regular quality control and quality assurance.

Environmental noise is regulated by two standards: Standard for Noise Levels in Residential and Civil Construction MNS 0012-1-009:1985 and Occupational Safety and Health, General Requirements for Noise and Safety MNS 5002:2000.

The manufacturing and safety of construction materials is regulated by the revised 2016 Law on Construction. The use of asbestos and paint containing lead is not regulated by a law.

The 2008 Law on Urban Development introduces the concept of a "healthy environment" for the purposes of urban development and sets requirements for urban zoning.

The 2006 Law on Toxic and Hazardous Chemicals regulates the export, import, transboundary movement, production, storage, selling, transportation, usage, disposal and control of toxic and hazardous chemicals (chapter 10). The 2008 Joint Order of the Minister of Environment and Minister of Health No. 04/04 approved the classification of toxic and hazardous chemicals, which is based on the United Nations Globally Harmonized System of Classification and Labelling of Chemicals. No specific action or legislation exists for paint containing lead and for toys and imported products containing lead.

The 2008 Law on Occupational Safety and Health is the main legal framework governing labour safety and health in the workplace. The 1996 Law on the Rights of the Child was amended in 2016 to introduce the restrictions on children's work in line with the 2015 observations of the Committee of the International Labour Organization under Convention No. 138 on the minimum age for admission to employment and work. Children under 15 years old are not allowed to work. The Law limits children's working hours and prohibits them from working overtime, on public holidays or at weekends. In February 2016, the Minister of Labour

approved an updated list of jobs prohibited for minors (Order No. A/36). It prohibits minors from working under conditions harmful to their lives, health, ethics, safety and development, and working with certain materials, such as hazardous substances. Horse racing and training between 1 November and 1 May is prohibited for children. However, during summer, children as young as 7 years old are still able to participate in horse racing.

The recently adopted 2017 Government Resolution No. 259 defines the responsibilities of various organizations both within and outside the health sector (e.g. NAMEM and GASI) to submit environmental health data to the National Centre for Public Health to enable it to perform environmental health research. It requires that information about research and surveys conducted is made publicly available through the Internet. The Resolution represents a step forward for strengthening surveillance and prevention but lacks detail on the exact environmental health indicators and frequency of submission of information.

#### *Policy framework*

##### National Programme on Environmental Health for the period 2006–2015

The 2005 National Programme on Environmental Health for the period 2006–2015 (2005 Government Resolution No. 245) focused on improving the environmental health monitoring, surveillance and evaluation system; analysing the impact of the environment on human health; reducing environmental pollution and minimizing the adverse impact of environmental factors on health; and environmental health education. According to the Environmental Health Profile of Mongolia, released by WHO and the Ministry of Health in 2016, the final evaluation report of the Programme indicates that a number of initiatives to improve the legal environment, EIA, multisector collaboration and research capacity have been carried out.

##### National Environmental Health Programme for the period 2017–2020

The 2017 National Environmental Health Programme (2017 Government Resolution No. 225) is designed for the period 2017–2020. It makes explicit references to the goals of the 2030 Agenda for Sustainable Development. Its objectives include:

- Reduce adverse impacts on human health from air pollution;
- Improve water quality and safety and reduce the impact on human health of soil pollution;

- Improve health surveillance and research;
- Strengthen capacity to respond to respiratory diseases and address human health hazards;
- Improve waste management of health organizations;
- Improve occupational safety and health conditions;
- Study and reduce the impact of chemicals on human health.

Apart from actions in these areas, planned activities include training for experts on evaluation of health impact assessments, various measures on adaptation of the health system to climate change and improvement of statistics on environmental health. The Programme includes some quantitative targets for 2018 and 2020. An action plan has been developed to be approved by the Minister of Health.

#### Other policy documents

The 2001 State Policy on Public Health (2001 Resolution of the State Great Khural No. 81) aims at protecting and promoting public health, establishing a supportive, healthy and safe environment for human living and employment, and improving the health system towards the predominance of public health services. In the area of environmental health, the Policy emphasizes:

- Reduction of air pollution in urban areas and introduction of advanced techniques and technologies to eliminate the causes and consequences of and prevent morbidity from acute and chronic respiratory disease;
- The increase of green areas;
- Improvement of technical conditions of urban WWTPs;
- Protection of soil from contamination by improving technologies for MSW disposal;
- Safe disposal of hazardous and radioactive substances and medical waste;
- The role of workplace safety and health standards to reduce occupational accidents.

The 2005 Health Sector Strategic Master Plan (2005 Government Resolution No. 72), designed for the period 2006–2015, was largely oriented towards implementation of the MDGs. In the area of environmental health, it emphasized the issues of air pollution, unsafe food and drinking water associated with the nomadic lifestyle practices in the rural areas, the disposal of human and animal waste and garbage, and some arsenic contamination in drinking water in the southern and eastern parts of Mongolia as issues requiring urgent attention.

The National Plan on Emerging Diseases and Public Health Emergencies for the period 2012–2016, approved by the Minister of Health, was designed to strengthen preparedness planning, prevention, early detection and rapid response to emerging diseases and other public health emergencies. In recent years, Mongolia has experienced significant outbreaks of novel infectious diseases and other outbreak-prone diseases.

The 2017 National Programme on Reduction of Air and Environmental Pollution for the period 2017–2025 (2017 Government Resolution No. 98) aims to create a safe and healthy environment, reducing pollution sources by optimizing urban planning, decentralization, improving the quality of and access to infrastructure and minimizing air and environment pollution by encouraging better lifestyles and environment. This Programme includes a health dimension and follows a global approach to addressing pollution impacts on the environment, health, the economy and energy. Its objectives are also to develop territorial management in a way that minimizes the impact of human activities on public health. It focuses on the implementation of optimal policies for urban development, planning and infrastructure, developing rural areas and decentralization. For domains covered in the Programme that lack available data, inventories on emission and pollutant sources would be conducted and physical impacts such as noise and electromagnetic fields analysed. This Programme is ambitious and requires the development of thematic programmes and operational action plans at several administrative levels (national to local). Thus, its implementation is based on strong collaboration and coordination.

The 2010 Water National Programme (chapters 1, 9) is being implemented. It has a strong focus on improving water, sanitation and living conditions for all. It also focus on the consequences of climate change on water resources in order to ensure water availability and comfortable living conditions in the future.

The water safety plan initiative has been carried out since 2012 under the framework of the Australia/WHO water quality partnership. Water safety plans are being developed in aimags, as well as in some smaller settlements.

To deal with the consequences of rapid urban development, the 2011 National Programme on Healthy Cities, Districts, Soums, Workplaces and Schools for the period 2012–2016 (2011 Government Resolution No. 359) deals with the negative effects of

rapid increase in the urban population for urban planning, infrastructure, health, housing, transport services, water supply and waste management. The Programme aims to take into account the need to prevent negative impacts on human health from urbanization through intersectoral cooperation and community participation.

The 2015 National Programme on Urbanization and Health (2016 Government Resolution No. 4) pursues the objectives to reduce the negative impacts of urbanization on people's health and create healthy and safe living conditions and to improve access to and quality of healthcare services.

The 2009 National Programme for Food Security for the period 2009–2016 (2009 Government Resolution No. 32) focuses on food and the agricultural sector. Its overall goal is to ensure sustainable supply of nutritious, secure and accessible food, which enables improved health and high labour productivity. Its four priority areas are promotion of sustainable livestock; introduction of environmentally friendly technologies; promotion of sustainable natural resource management; and development of a value chain: improvement of food products, food safety standards and food marketing. It includes the implementation of a national Codex Alimentarius.

The purpose of the Second Programme for Prevention and Control of Diseases Resulting from Unhealthy Lifestyle for the period 2014–2021 (2014 Government Resolution No. 34) is to prevent and reduce the incidence of non-communicable diseases in the country.

A National Cancer Control Programme 2007–2017 focuses on cancer prevention, early detection, therapy and palliative care. Environmental factors as well as occupational factors are taken into account and action plans have been proposed. The Programme also has a focus on quantitative data (monitoring data and cancer registry) and management funding. The Programme offers a set of recommendations. No intermediate implementation report is available.

The National Immunization Programme began in 1991 and covers vaccination against TB, polio,

hepatitis B, diphtheria, pertussis, tetanus and measles. Immunization against rubella was introduced in 2002. Table 15.6 shows average immunization coverage in 2015–2016.

A National Programme on Maternal and Child Health for the period 2011–2015 contributed to achieving the MDGs target of reducing the maternal mortality rate to 50 deaths per 100,000 live births. The target was achieved in 2013 when the rate was 42.6 deaths per 100,000 live births.

The National Programme on Maternal and Child Health (2017 Government Resolution No. 78) will be implemented in the period 2017–2021. Among other issues, it will focus on:

- Increasing access to family planning services;
- Improving registration, surveillance, monitoring and evaluation of maternal, child and reproductive healthcare services;
- Increasing the participation and responsibilities of family members and citizens in protecting the mother, child and reproductive health.

The objective of the 2009 Healthcare Waste Management Strategy and Action Plan for the period 2009–2013 was to create a system for collection, classification, transport and treatment of waste from healthcare organizations (chapter 10).

The fourth National Programme on Improvement of Occupational Safety and Health Conditions (2012 Government Resolution No. 122 (no longer valid)) was replaced with the fifth National Occupational Safety and Health Programme (2017 Government Resolution No. 243). These Programmes aim to enforce occupational safety and health standards, procedures, rules and technological regimes.

#### Draft policy documents

A strategy on mining and health for the period 2015–2020 has been drafted. Its main objective is to protect the health of the local population in mining areas and to strengthen the capacity of the local health sector.

**Table 15.6: Average immunization coverage for infants, 2015–2016, per cent**

	Penta vaccine		POL 3		Hepatitis A		DT	
	2015	2016	2015	2016	2015	2016	2015	2016
Aimags	99.3	98.9	97.5	99.1	97.7	99.1	95.5	96.0
Ulaanbaatar	98.4	98.4	97.5	97.9	97.5	97.8	91.5	95.5
Mongolia	98.9	98.7	97.5	98.5	97.6	98.5	94.1	95.8

Source: Centre for Health Development, 2017.

The national plan for measles and rubella elimination for the period 2016–2020 and the national red or watery eyes procedures for preparedness for and response to infectious diseases outbreaks are being prepared.

*Sustainable Development Goals and targets relevant to this chapter*

The current stand of Mongolia vis-à-vis Targets 2.1, 3.1, 3.2, 3.3, 3.4, 3.9, 3.a and 8.8 of the 2030 Agenda for Sustainable Development is described in box 15.4.



**Box 15.4: Targets 2.1, 3.1, 3.2, 3.3, 3.4, 3.9, 3.a and 8.8 of the 2030 Agenda for Sustainable Development**

**Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture**

**Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round**

The challenge for Mongolia is to address the strong disparities among the population in relation to several factors, such as population livelihood (herders), location (urban, rural), weather impacts (dzud) and poverty. The poverty headcount ratio (per cent) in Mongolia was 36.3 per cent in 1995 and decreased to 21.6 per cent in 2014; however, differences by region were observed. The eastern region had a ratio of 31.4 per cent. The development of a poor population in urban ger areas is a significant issue to be resolved by the authorities. The Mongolian Sustainable Development Vision 2030 aims to reduce the poverty rate to zero by 2030.

By inducing critical loss of livestock, dzuds have deleterious effects on nutrition and induce poverty in the herder population. Indeed, animals play a vital role in household food security, providing essential nutritional needs through meat and milk. The management of natural resources, development of environmentally friendly production technologies and adaptation to and mitigation of climate change are some of the keys to reaching this target.

This target is measured by the prevalence of undernourishment (Indicator 2.1.1). The prevalence of underweight children under 5 decreased from 12.0 per cent in 1992 to 1.6 per cent in 2013. The prevalence of stunting in children under 5 was 12.0 per cent in 1992, 15.9 per cent in 2010 and 10.8 per cent in 2013. The prevalence of wasting (weight for height) in children under 5 was 5.5 per cent in 2000, decreased to 2.3 per cent in 2010 and was 1.0 per cent in 2013.

Indicator 2.1.2 is the prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES). The FIES is a measure of access to food at the level of individuals or households. It requires a specific questionnaire and analysis to be determined; no data are yet available in Mongolia.

**Goal 3: Ensure healthy lives and promote well-being for all at all ages**

**Target 3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births**

Mongolia has made steady progress in improving the health of its population over the two last decades. However, the country has to face regional disparities concerning persistent inequalities in access to health care.

Since 2004, the maternal mortality ratio (MMR) (Indicator 3.1.1) is less than 100 deaths per 100,000 live births in Mongolia. The previous MDG target of 50 deaths per 100,000 live births was achieved in 2013 (MMR of 42.6 deaths per 100,000 live births). In 2015, all regions had an MMR of less than 50 deaths per 100,000 live births, with a maximum of 28.7 in the central region. This decrease is associated with the implementation of medical treatment for pregnant women with pregnancy-related complications, as well as the provision of medical treatment to women from remote regions. However, in 2015, the MMR varied among aimags from 0 to 78.5 (Tuv Aimag) deaths per 100,000 live births. Strong variations are also observed by year in the same aimag.

The target level for MMR, 15 deaths per 100,000 live births by 2030, has been set by the Mongolia Sustainable Development Vision 2030. The country plans to reach this objective in three phases. In order to reduce factors affecting preventable maternal and child mortality, Mongolia aims to improve the quality and accessibility of reproductive healthcare services and to reduce malnutrition. The challenge will be to reduce the strong disparities between aimags and to reach the target in all aimags.

The proportion of births attended by skilled health personnel (Indicator 3.1.2) has been 99–100 per cent since 1991.

The 2013 fifth National Progress Report on the MDGs suggests that the Government focus on universal access to sexual and reproductive health services and reducing maternal mortality due to external causes.

**Target 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births**

The two global indicators for this target are under-5 mortality rate (Indicator 3.2.1) and neonatal mortality rate (Indicator 3.2.2).

A strong decline in the under-5 mortality and infant mortality rates occurred in Mongolia between 1990 and 2010.

In 2015, the under-5 mortality rate was 18.0 per 1,000 live births. However, strong differences by region are observed. Indeed, the under-5 mortality rate (per 1,000 live births) varied from 13.7 in the central region to 25.3 in the western region. The country has to pursue its efforts and focus them on several geographical areas, such as the western region, in order to reduce the under-5 mortality rate to less than 15 per 1,000 live births by 2020 and less than 9 per 1,000 live births by 2030, as proposed by the Mongolia Sustainable Development Vision 2030.

The infant mortality rate was 15.3 per 1,000 live births in 2015; the gender ratio for infant mortality was 58.6 per cent male and 41.4 per cent female. The leading cause of infant mortality was diseases originating in the perinatal period in urban and rural areas. Strong differences by region were observed in infant mortality. In 2015, the infant mortality rate (per 1,000 live births) varied from 11.2 in the central region to 21.6 in the western region. The infant mortality rate was higher than 15.0 per 1,000 live births (the previous MDGs target) in two regions (Khangai and the western region) and 11 aimags. This demonstrates the need to develop actions to reduce regional inequality and to reach the target infant mortality rate of 8 per 1,000 live births.

In 2015, 80,875 live births were recorded; 4.4 per cent of all newborns had a birth weight lower than 2,500 g and 94.8 per cent of newborns were breastfed during their first hour of life. The rate of stillbirths was 6.8 per 1,000 births in 2015. A total of 16,799 neonatal morbidity cases (20.8 per cent of all live births) were registered in 2015.

In 2016, more than half (54.8) per cent of deaths in infant mortality occurred during the neonatal period; the neonatal mortality rate was 9.2 per 1,000 live births (721 cases): 73.2 per cent of neonatal deaths (528 cases) occurred in the early neonatal period, the first 0–6 days of life, whereas 26.8 per cent of neonatal deaths (193 cases) occurred in the late neonatal period, the first 7–28 days of life.

**Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases**

In 2015, the prevalence of HIV in the Mongolian population was less than 0.1 per cent and among pregnant women and among youth aged 15–24 was lower than 0.05 per cent. Since 1992, there have been 199 registered cases; of these, 159 were males and 39 were females, and 27 persons died.

Since 2011 TB incidence per 100,000 population (Indicator 3.3.2) varied around 140. The death rate from TB has slowly decreased since 1990. It was 4.8 per 100,000 population in 1990, 3.1 in 2000, 3.3 in 2010 and 2 in 2014.

The proportion of TB cases diagnosed and treated by Directly-Observed Treatment Short course (DOTS) was 62.5 per cent in 1995 and gradually increased to 80.7 per cent in 2014. The 2013 fifth National Progress Report on the MDGs underlines that "treatment failure and default rates of multidrug-resistant tuberculosis (MDR-TB) patients are growing due to insufficient treatment monitoring at the soum level. Inadequate preventive measures for contact with MDR-TB patients result in increased incidence of MDR-TB in children of the patients".

Indicator 3.3.3 is malaria incidence per 1,000 population. One case of malaria has been reported in Mongolia in 2015.

Mongolia is highly endemic for hepatitis B virus and was one of the first countries to introduce hepatitis B vaccine into routine immunization schedules for newborns and children under 1 year of age. Consequently, the incidence of viral hepatitis B decreased substantially. In 2015, among viral hepatitis infections registered in Mongolia, 54.1 per cent was viral hepatitis B. Since 2011, registered hepatitis B incidence per 10,000 population (the global indicator 3.3.4 is hepatitis B incidence per 100,000 population) varied around 2; it was 2.7 in 2011 and slowly decreased to 1.6 in 2015.

The objective set by the Mongolia Sustainable Development Vision 2030 is to decrease the spread of communicable diseases through prevention, early detection and available treatment. To achieve this, vaccination and the capacity of health services are key factors. The target for 2030 is to reduce hepatitis and TB prevalence to 2 and 13 per 10,000 population, respectively.

**Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being**

The two global indicators for this target are: mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease (Indicator 3.4.1) and suicide mortality rate (Indicator 3.4.2).

In Mongolia, non-communicable diseases were estimated to account for 79 per cent of total deaths (19,000 deaths) in 2014, with cardiovascular diseases prevailing (43 per cent). Cancers constituted 17 per cent of all deaths, chronic respiratory diseases 3 per cent of all deaths and diabetes 1 per cent of all deaths. In 2016, the cardiovascular disease mortality rate was 174.5 per 100,000 population (against the 2030 target of 14 deaths per 10,000 population), the cancer mortality rate was 133.1 per 100,000 population (against the 2030 target of 8 deaths per 10,000 population), the respiratory disease mortality

rate was 22.6 per 100,000 population and the diabetes mortality rate was 5.4 per 100,000 population.

To reach the ambitious 2030 targets, the country plans to reduce people's bad habits and improve the living environment. Cancer prevention and monitoring actions are regularly performed. In 2015, early screening for breast and cervical cancer was performed on 72,851 women, representing 69.5 per cent of the women invited to participate.

Since 2014, Mongolia has been implementing the Second Programme for Prevention and Control of Diseases Resulting from Unhealthy Lifestyle for the period 2014–2021, which could be a good tool for tracking the evolution of these indicators.

In 2015, the number of suicide deaths was 479, of which 408 were of males and 71 of females.

**Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination**

Several actions have to be implemented in order to improve the quality of people's lives and to develop a healthy environment for the population. The protection of water resources, development of drinking water supply, improvement of drinking water quality and development of sanitation and hygiene facilities are among the major objectives to be reached. The country also has to focus on reducing ambient air pollution and indoor air pollution in homes and public buildings such as schools and hospitals. Accordingly, the country has to develop a system to determine correlation and to follow the SDG indicators for Target 3.9. Additional information on Target 3.9 is presented in boxes 8.1 and 10.3.

**Target 3.a: Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate**

The age-standardized prevalence of current tobacco use among persons aged 15 years and older (Indicator 3.a.1) was 27.1 per cent in 2013.

**Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**

**Target 8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment**

The economy of Mongolia increasingly relies on mining, construction, transportation and energy, which are the sectors highly relevant in terms of industrial accidents and occupational diseases. The current challenge is enforcement of occupational safety and health standards, procedures, rules and technological regimes in line with the growing number of household-based and small- and medium-sized enterprises. Due to insufficient enforcement of occupational safety and health standards, occupational and health hazards are not decreasing. For instance, in the period 2005–2011, 661 work-related deaths occurred in Mongolia and 1,321 new cases of occupational disease were registered, and 83,940.5 million tugriks were paid for pensions, benefits and compensation, from industrial accident and occupational disease insurance.

*Institutional framework*

Ministry of Health

The Ministry of Health ensures availability, accessibility, affordability and equity of quality healthcare services for the entire population. One of the goals of the Ministry is to prevent illness through promoting healthy, secure and nutritious food. The Ministry is responsible for formulating and monitoring all health policies, national programmes and national standards. National health agencies and health institutions at the local level have the role of implementing the health policies and programmes. In 2017, three staff worked on environmental health in the Ministry and 18 worked in the Environmental Health Department at the National Centre for Public Health. Until 2013, one official in the Ministry was in charge of climate change and health but, since 2013, no action in this area has been taken.

The Emerging Disease Surveillance and Response Unit works to build sustainable national systems and

sufficient capacity to ensure public health security, through preparedness planning, prevention, early detection and rapid response to emerging infectious diseases, including epidemic-prone diseases.

The National Centre for Public Health was established in 1968 to expand evidence-based policymaking and decision-making support, and to provide technical guidance and bolster human resource capacity in order to increase access to and quality of health care by social services. Previously named the Institute of Public Health, its organizational structure and strategy were expanded to form the National Centre for Public Health in 2013. In line with the extended structure, while keeping its leading role in public health research, the National Centre for Public Health is responsible for a broad range of public health programme implementation and health promotion activities at the national level. The Centre's work focuses on the following sectors, among others: environment, occupational health and research, venom toxicity studies, nutrition research, and health promotion and behavioural research.

The Centre for Health Development collects data on all health indicators, compiles them each month and produces a yearbook. Family doctors at the soum level send the indicator values to the aimag health department, which sends the information to the Centre for Health Development on the first day of each month.

Several other national centres focus on specific areas, including the National Centre for Communicable Diseases, National Centre for Non-communicable Diseases, National Centre for Cancer (NCC) and National Health Centre. The central office of the Cancer Registry is located at the NCC. The NCC routinely obtains data of cancer morbidity and mortality from district hospitals and aimag health centres.

The WHO Country Office in Mongolia emphasizes that recent outbreaks of infectious diseases have revealed weaknesses in the public health infrastructure. The results of the annual International Health Regulations (IHR) self-assessment using the IHR Core Capacity Monitoring Framework indicated that minimum core capacities are in place for communicable disease surveillance and response. To fully achieve IHR requirements, there is a need to further strengthen subnational-level surveillance and response capacity. Weekly analysis and feedback of surveillance data of epidemic-prone diseases are in place at the national level, but the subnational level has limited capacity for routine risk assessment.

#### Ministry of Food, Agriculture and Light Industry

The Ministry of Food, Agriculture and Light Industry is responsible for the development and implementation of policy and legislation on animal husbandry, crop cultivation, food safety and light industry. The Ministry is responsible for the packaging and safe handling of fertilizers and pesticides. Use of pesticides and chemicals in agriculture is a joint responsibility of the Ministry of Environment and Tourism, Ministry of Food, Agriculture and Light Industry and Ministry of Health (chapter 1).

#### Ministry of Environment and Tourism

The Ministry of Environment and Tourism is responsible for environmental issues, such as air, water, forests, soil, desertification, nature conservation, biodiversity and protected areas, waste and environmental assessments.

#### General Agency for Specialized Inspection

GASI health inspectors and environmental inspectors (chapters 1 and 2) are in charge of inspections in accordance with provisions on enforcement and inspection in the relevant laws governing health and environmental issues. Among other tasks, GASI performs inspection and monitoring of water sources and distribution points for drinking water control. For food safety control, inspection focuses on the entire process, from raw material to the final product. Inspections also cover hospitals to control hygiene, sanitation and waste management.

#### Municipality of Ulaanbaatar

The Environmental Health Department of Ulaanbaatar Municipality began functioning in 2000 and is in charge of the development of actions to reduce the impact of environmental pollutants on human health. It focuses more especially on water quality, sanitation facilities, waste management and air quality. It undertakes preventive actions and delivers advice on hygiene and healthy practices. It also collaborates with environmental and health institutions, family doctors and schools in Ulaanbaatar.

#### *Preventive measures*

There is a monitoring system for the incidence of infectious diseases. It includes systematized accounting and incidence reporting by healthcare organizations to the Centre for Health Development.

Several national programmes have been developed to prevent diseases related to health determinants such as the environment, lifestyle and addictions. Several days are dedicated to specific preventive actions (e.g. World Asthma Day, World No Tobacco Day and World Diabetes Day).

#### *Environmental health-related agreements*

Mongolia is a party to 20 ILO conventions, including the following ones relevant to environmental health:

- Occupational Safety and Health Convention, 1981 (No. 155) (since 1998);
- Safety and Health in Mines Convention, 1995 (No. 176) (since 2015);
- Minimum Age Convention, 1973 (No. 138) (since 2002; minimum age specified: 15);
- Worst Forms of Child Labour, 1999 (No. 182) (since 2001).

Several ILO conventions on environmental health are not ratified by Mongolia, including:



- Labour Inspection Convention, 1947 (No. 81);
- Labour Inspection (Agriculture) Convention, 1969 (No. 129);
- Radiation Protection Convention, 1960 (No. 115);
- Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 (No. 148);
- Occupational Safety and Health Convention, 1979 (No. 152);
- Asbestos Convention, 1986 (No. 162);
- Safety and Health in Construction Convention, 1988 (No. 167);
- Chemicals Convention, 1990 (No. 170).

## 15.6 Assessment, conclusions and recommendations

### *Assessment*

During the last two decades, the health status of the Mongolian population improved. Vaccination programmes, access to care and preventive actions have all contributed to this improvement. However, great differences in health indicators are observed between regions and aimags. Depending on the region, the livelihood and environment of the population differ strongly, inducing different health impacts. Improving access to healthcare for those living in remote areas is one of the key factors in reducing health inequalities. However, human health depends on several factors, including environmental, nutritional, social, educational and occupational factors.

Although a database for registration of health factors has been established, diseases such as asthma, asbestos-related diseases and legionellosis are not registered. The environmental factors related to the diseases cannot be identified. Environmental investigation of specific signals such as lead poisoning and CO intoxication are not carried out; identification of the origin of the exposure and its removal are not performed.

Several national research centres under the Ministry of Health are working on specific areas. The scientific work and data analysis capacity of teams is a major asset for the Government in its attempts to identify environmental health problems and build the appropriate policies in response.

Compared with other goals and targets of the 2030 Agenda for Sustainable Development, Mongolia is well placed for implementation of Goal 3, since data for many of its indicators are available and the national targets for the period until 2030 have already been set, primarily in the Mongolia Sustainable Development Vision 2030 – the most authoritative policy document

in the country.

### *Conclusions and recommendations*

#### Environmental health indicators

The Mongolian population is exposed to several pollutants via different environmental media – air, water and soil. The 2017 Government Resolution No. 259 defines the responsibilities of various organizations both within and outside the health sector for the submission of environmental health data to the National Centre for Public Health to enable it to perform environmental health research. In general, this resolution represents a step forward for strengthening surveillance and prevention, but it lacks detail on the exact environmental health indicators and frequency of submission of information.

#### Recommendation 15.1:

*The Ministry of Health, in cooperation with the National Statistics Office, should continue implementation of the 2017 Government Resolution No. 259 to define environmental health indicators, ensure collection of the data on environmental health indicators and make them publicly available.*

#### Studying the health impact of exposure to environmental factors

Databases on dangerous substances (chemicals, hazardous waste, asbestos, lead, radon) and on their emission and locations are not established, or data are not collected or not included in databases. Consequently, exposure of the population to these contaminants and their impact on health are not defined and it is difficult to prevent such exposure.

#### Recommendation 15.2:

*The Ministry of Health, in cooperation with academic institutions, should:*

- Carry out studies on the health impact of environmental factors;*
- Develop registration of diseases related to environmental exposure, such as those related to asbestos, arsenic, mercury, lead poisoning and legionellosis;*
- Carry out in-depth investigations of cases of these diseases to determine and remove the exposure source.*

#### The need for an overarching strategy for environmental health

The Government has taken into account the disparities among the country's population and has set the

environmental health goals. The 2017 National Environmental Health Programme designed for the period 2017–2020 prioritizes work to reduce health impacts from air, water and soil pollution, and from chemicals. Several other environmental-health-related programmes exist, but their implementation at the aimag and local levels and their final assessment are not available. Thus, the links between the different plans and programmes are not clear. The priorities and overarching strategy for environmental health are not defined. There is a lack of thematic action plans, such as action plans on asbestos, indoor air quality and environmental noise.

Knowledge of the impact of environmental factors on population health is limited to specific media, such as air pollution, but the impacts on health of asbestos, noise, chemicals and anthropogenic activities are not documented. It is important to identify the main environmental factors that are detrimental to public health in order to determine appropriate actions and priorities.

Recommendation 15.3:

*The Government should:*

- (a) *Develop and implement an overarching strategy for environmental health based on assessment of the implementation of policy documents related to environmental health;*
- (b) *Develop and implement thematic national programmes on various environmental health components based on an overarching strategy for environmental health;*
- (c) *Implement the environmental health action plan in cooperation with relevant stakeholders at all administrative levels.*

Water safety

Access to safe water and sanitation is an issue in rural and remote areas. Protection of water resources is not systematic, though it is one of the first steps needed to maintain water quality and prevent water contamination. A water safety profile was performed that underlined the risks facing drinking water quality, water sources and sanitation infrastructures. It highlighted the need for a comprehensive state policy on water quality, resource protection and water use.

Of all cases of infectious disease, 59.5 per cent were of preschool and school-age children. Access to good quality, safe drinking water in schools and kindergartens is an issue, especially in remote areas. Several local actions are performed by national and international organizations to ameliorate this situation, but they are not replicated in all regions.

Since 2012, the water safety plan initiative has been carried out in many urban and rural areas under the framework of the Australia/WHO water quality partnership, but this is not yet under governmental ownership.

Recommendation 15.4:

*The Ministry of Health, in cooperation with the Ministry of Environment and Tourism and the Ministry of Construction and Urban Development, should:*

- (a) *Continue to implement the water safety plans based on the experience of the water safety plan initiative;*
- (b) *Ensure access to safe drinking water and sanitation in all schools and kindergartens;*
- (c) *Develop actions and policies to reduce water pollution;*
- (d) *Implement drinking water desalination programmes in the southern region.*

Urban planning and environment and health impact assessments

Environmental stress is multifactorial and its cumulative effect has a deleterious effect on health. It is difficult to act specifically on each factor. However, by integrating the environmental health aspects into urban planning and development, it is possible to favour the development of a healthy environment. Urban planning and environment and health impact assessments are key tools for developing healthy cities, but are not yet used in Mongolia to reduce either urban pressure or detrimental environmental factors.

The Government has started to introduce environmental and health impact assessments. The recent introduction of health impact assessment is a good step forward in order to prevent population exposure to harmful environmental conditions and to develop a healthy environment.

Recommendation 15.5:

*The Government should:*

- (a) *Ensure that environmental and health impact assessments are carried out and their conclusions are respected;*
- (b) *Integrate environmental health aspects into urban planning and development in order to develop healthy cities.*

Health impact of air pollution

Air pollution is an issue, in particular in Ulaanbaatar, where the annual concentrations of SO<sub>2</sub> and NO<sub>2</sub> often

exceed WHO guidelines. Industrial emissions have to be identified and regulated. Indoor air quality is an important health determinant, especially for babies and children who spend a lot of time inside, at home or at school. A report by UNICEF (2016) demonstrates the health impact of air pollution, and especially indoor air pollution, on children. The indoor air quality studies conducted focused on pollutants released by coal burning.

Recommendation 15.6:

*The Government should:*

- (a) *Develop and implement actions to limit the emission of pollutants into air and to reduce population exposure to indoor and outdoor air pollution.*
- (b) *Improve national standards on emission of air pollutants.*

Asbestos and lead

Asbestos is still in use in Mongolia. Several actions were implemented to tackle the use of asbestos; however, this work stopped and the objectives dealing with development of standards, regulations, a control system and disease registration were not implemented. There are currently no standards for asbestos exposure and no policy for detection of asbestos in buildings before demolition.

Leaded gasoline was banned in 2008. However, lead is released into air during coal combustion for heating in winter and for cooking. There is a lack of data concerning the different sources of lead exposure, such as lead in paint and toys, lead and occupational exposure and lead in dust and soil, and their impact on health.

The use of asbestos and paint containing lead is not regulated by law. No environmental investigations of specific signals such as lead poisoning are carried out.

Recommendation 15.7:

*The Government should:*

- (a) *Collect information and carry out an inventory on the use and distribution of asbestos and lead;*
- (b) *Carry out a study on asbestos exposure, including occupational exposure;*
- (c) *Develop legislation and measures to eliminate the use of asbestos and lead in paint;*
- (d) *Develop measures to reduce children's exposure to lead;*
- (e) *Develop waste management for asbestos and lead.*

Mining and health

Mining activities have increased during the last two decades, which has had an impact on the environment and on the health of the workers, the general population and livestock. The population of mining areas is subject to the cumulative impact of mining activities on air, soil, water and animals (livestock) and, consequently, on their health. However, it is difficult to determine the extent to which there is an impact on public health. The Ministry of Health, the Ministry of Environment and Tourism and the Ministry of Mining and Heavy Industry, along with WHO, have jointly prepared a draft strategy on mining and health for the period 2015–2020. As of mid-2017, the draft is not yet adopted.

Recommendation 15.8:

*The Government should:*

- (a) *Adopt the draft strategy on mining and health and implement it;*
- (b) *Carry out a comprehensive survey on the impact of mining activities on health;*
- (c) *Implement actions to reduce pollutant emission and exposure.*

Chemical safety and soil pollution

Anthropogenic activities result in soil pollution and, consequently, could be responsible for human exposure to pollutants. However, no database on polluted soils is available in Mongolia and no study has been performed on their impact on health. Untreated industrial wastewater from factories, tanneries and mining sites pollute rivers. However, no data are available concerning compounds and volumes of industrial releases, and no evaluation of their impacts on the environment and health is performed.

Recommendation 15.9:

*The Government should:*

- (a) *Establish a database and metadatabase on polluted soils;*
- (b) *Carry out a survey on the impact on public health of chemicals (polluted soils, industrial emissions);*
- (c) *Implement actions and a risk-reduction policy to reduce chemical exposure of the population.*

ILO conventions

Mongolia is a party to a number of ILO conventions related to environmental health issues. However, several ILO conventions on environmental health issues are not ratified by Mongolia. Among other

matters, participation in these conventions would assist the country's efforts to promote safe and secure working environments for all workers, in line with Target 8.8 of the 2030 Agenda for Sustainable Development.

Recommendation 15.10:

*The Ministry of Social Welfare and Labour should consider accession to the ILO conventions on environmental health issues, viz.:*

- (a) *1947 Labour Inspection Convention (No. 81);*
- (b) *1969 Labour Inspection (Agriculture) Convention (No. 129);*
- (c) *1960 Radiation Protection Convention (No. 115);*
- (d) *1997 Working Environment (Air Pollution, Noise and Vibration) Convention (No. 148);*
- (e) *1979 Occupational Safety and Health Convention (No. 152);*
- (f) *1986 Asbestos Convention (No. 162);*
- (g) *1988 Safety and Health in Construction Convention (No. 167);*
- (h) *1990 Chemicals Convention (No. 170).*



## ***ANNEXES***

***Annex I: Participation of Mongolia in multilateral environmental agreements***

***Annex II: List of major environment-related legislation***

***Annex III: Sources***

***Annex IV: Maps***



*Annex I****PARTICIPATION OF MONGOLIA IN MULTILATERAL ENVIRONMENTAL AGREEMENTS***

Year		Mongolia	
		Year	Status
1958	(GENEVA) Convention on the Continental Shelf		
1958	(GENEVA) Convention on Fishing and Conservation of the Living Resources of the High Seas		
1958	(GENEVA) Convention on the Territorial Sea and the Contiguous Zone		
1958	(GENEVA) Convention on the High Seas	1976	Ac
1960	(GENEVA) Convention concerning the Protection of Workers against Ionising Radiations (ILO 115)		
1961	(PARIS) International Convention for the Protection of New Varieties of Plants		
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage		
	1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage		
1968	(LONDON, MOSCOW, WASHINGTON) Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	1969	Ra
1969	(BRUSSELS) Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties		
1971	(RAMSAR) Convention on Wetlands of International Importance Especially as Waterfowl Habitat	1997	Ac
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)		
1971	(BRUSSELS) Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage		
	1992 Fund Protocol		
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof	1971	Ra
1972	(PARIS) Convention concerning the Protection of the World Cultural and Natural Heritage	1990	At
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter		
	1996 (LONDON) Protocol		
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction	1972	Ra
1972	(LONDON) International Convention on the International Regulations for Preventing Collisions at Sea	2002	Ac
1972	(GENEVA) International Convention for Safe Containers		
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora	1996	Ac
	1979 (BONN) Amendment	1996	At
	1983 (GABORONE) Amendment		
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL)		
	1978 (LONDON) Annex I on Prevention of Pollution by Oil	2003	Ac
	1978 (LONDON) Annex II on Control of Pollution by Noxious Liquid Substances in Bulk	2003	Ac
	1978 (LONDON) Annex III on Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form	2003	At
	1978 (LONDON) Annex IV on Prevention of Pollution by Sewage from Ships	2003	At
	1978 (LONDON) Annex V on Prevention of Pollution by Garbage from Ships	2003	Ra
	1997 (LONDON) Annex VI on Prevention of Air Pollution from Ships	2007	Ac
1973	(GENEVA) Convention concerning Minimum Age for Admission to Employment (ILO 138)	2002	Ra
1974	(GENEVA) Convention concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents (ILO 139)		
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)		
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals	1999	Ra
1980	(NEW YORK, VIENNA) Convention on the Physical Protection of Nuclear Material	1986	Ra
1981	(GENEVA) Convention Concerning Occupational Safety and Health and the Working Environment (ILO 155)	1998	Ra

Ac = Accession; Ad = Adherence; Ap = Approval; At = Acceptance; De = Denounced; Si = Signature; Su = Succession; Ra = Ratification.



Year		Mongolia	
		Year	Status
1982	(MONTEGO BAY) Convention on the Law of the Sea	1996	Ra
	1994 (NEW YORK) Agreement related to the Implementation of Part XI of the Convention	1996	Ra
	1995 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks		
1985	(GENEVA) Convention Concerning Occupational Health Services (ILO 161)		
1985	(VIENNA) Convention for the Protection of the Ozone Layer	1996	Ac
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	1996	Ac
	1990 (LONDON) Amendment to Protocol	1996	Ac
	1992 (COPENHAGEN) Amendment to Protocol	1996	Ac
	1997 (MONTREAL) Amendment to Protocol	2002	Ra
	1999 (BEIJING) Amendment to Protocol	2008	Ra
	2016 (KIGALI) Amendment to Protocol		
1986	(GENEVA) Convention Concerning Safety in the Use of Asbestos (ILO 162)		
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident	1987	Ra
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1987	Ra
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1997	Ac
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(GENEVA) Convention concerning Safety in the use of Chemicals at Work (ILO 170)		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation		
1992	(RIO DE JANEIRO) Convention on Biological Diversity	1993	Ra
	2000 (MONTREAL) Cartagena Protocol on Biosafety	2003	Ac
	2010 (NAGOYA) Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	2013	Ra
	2010 (NAGOYA - KUALA LUMPUR) Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety	2013	Ra
1992	(NEW YORK) United Nations Framework Convention on Climate Change	1993	Ra
	1997 (KYOTO) Kyoto Protocol	1999	Ac
	2012 (DOHA) Doha Amendment to the Kyoto Protocol		
	2015 (PARIS) Paris Agreement	2016	Ra
1993	(ROME) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas		
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	1995	Ra
1994	(LISBON) Energy Charter Treaty	1999	Ra
	1994 (LISBON) Protocol on Energy Efficiency and Related Environmental Aspects	1999	Ra
	1998 Amendment to the Trade-Related Provisions of the Energy Charter Treaty	1999	Ra
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) United Nations Convention to Combat Desertification	1996	Ra
1995	(GENEVA) Convention concerning Safety and Health in Mines (ILO 176)	2015	Ra
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management		
1997	(NEW YORK) Convention on the Law of Non-navigational Uses of International Watercourses		
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage		
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	2001	Ra
1999	(GENEVA) Convention concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour (ILO 182)	2001	Ra
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants	2004	Ra
2001	(LONDON) Convention on Civil Liability for Bunker Oil Pollution Damage	2011	Ac
2003	(GENEVA) WHO Framework Convention on Tobacco Control	2004	Ra
2004	(LONDON) Convention for the Control and Management of Ships' Ballast Water and Sediments	2011	Ac
2013	(KUMAMOTO) Minamata Convention on Mercury	2015	Ra

Ac = Accession; Ad = Adherence; Ap = Approval; At = Acceptance; De = Denounced; Si = Signature; Su = Succession; Ra = Ratification

*Annex II****LIST OF MAJOR ENVIRONMENT-RELATED  
LEGISLATION*****I. List of environment sector basic laws and other relevant laws**

Constitution of Mongolia	1992.01.13
Law on Underground Wealth	1988.11.29
Law on National Security Council of Mongolia	1992.05.29
Law on Government of Mongolia	1993.05.06
Law on Orientation for Joint Inspection of State Borders	1993.07.09
Law on Legal Status of Cities and Towns	1993.12.20
Law on State Symbols	1994.05.20
Law on Legal Status of Capital City	1994.07.05
Law on Regulation of Demonstrations and Meetings	1994.07.07
Law on Special Protected Areas	1994.11.15
Law on Ensuring Unity of Measurement	1994.12.22
Law on Environmental Protection	1995.03.30
Law on Natural Flora	1995.04.11
Law on Resolving Complaints made by Citizens against Civil Servants and State Bodies	1995.04.17
Law on Partnership	1995.05.11
Law on Privacy of Organizations	1995.05.16
Law on Gasoline and Diesel Fuel Tax	1995.06.02
Law on Export Customs Duty on Some Goods	1996.03.29
Law on State and Local Property	1996.05.27
Law on Non-governmental Organizations	1997.01.31
Law on Land Fees	1997.04.24
Law on Statistics	1997.06.05
Law on Buffer Zones of Special Protected Areas	1997.10.23
Law on Geodesy and Cartography	1997.10.31
Law on Hydrology, Meteorology and Environmental Monitoring	1997.11.13
Law on Consolidated State Budget for 1998	1997.11.21
Law on Technology Transfer	1998.05.07
Law on Mobilization	1998.05.15
Law on Consolidated State Budget for 1999	1998.12.03
Law on Apartments	1999.04.22
Law on Labour	1999.05.14
Law on Use of the Sea	1999.05.28
Law on Seed Varieties and Crop Plants	1999.06.17
Law on Consolidated State Budget for 2000	1999.12.01
Law on Cadastre Mapping and Land Cadastre	1999.12.16
Law on Auto Transportation	1999.06.04
Law on Intelligence Organizations	1999.07.08
Law on Nuclear-weapon-free Status	2000.02.03
Law on Tourism	2000.05.05
Law on Government Special Funds	2006.06.29
Law on Consolidated State Budget for 2001	2000.11.23
Law on the National Human Right Commission	2000.12.07
Law on Special Permission for the Operation of Entities	2001.02.01
Law on Energy	2001.02.01
Law on Consolidated State Budget for 2002	2001.11.23
Law on National Security	2001.12.27
Civil Law/ Code	2002.01.10
Law on Civil Procedures	2002.01.10
Law on Primary and Secondary Education	2002.05.03
Law on Education	2002.05.03
Law on Higher Education	2002.05.03
Law on Advertising	2002.05.30

Law on Land	2002.06.07
Law on Allocation of Land to Mongolian Citizens for Ownership	2002.06.27
Law on Allocation of Land to Mongolian Citizens for Ownership	2002.06.27
Law on Civil Service	2002.06.28
Law on the Regulation of Foreign Trade in Endangered Animal and Plant Species and Derivatives Thereof	2002.11.07
Law on Consolidated State Budget for 2003	2002.11.22
Law on Control and Circulation of Drugs and Psychotropic Substances	2002.11.28
Law on Quarantine Investigation on Transit of Animals, Plants, Their Raw Materials and Products Through the State Border	2002.11.28
Law on State Supervision and Inspection	2003.01.03
Law on Standardization and Conformity Assessment (invalid since 21 December 2017)	2003.05.15
Law on Postal Service	2003.05.15
Law on Governance and Regulation of Zonal Development	2003.05.30
Law on Legal Status of Apartment Owners Union, Joint Property for Public Use of Apartment Buildings	2003.06.18
Law on State Registration of Property Ownership and Other Related Property Rights	2003.06.19
Law on Consolidated State Budget for 2004	2003.11.28
Law on Consumer Rights Protection	2003.12.26
Law on National Holidays and Observance Days	2003.12.28
Law on Legal Status of State Ministries	2004.04.15
Law on Consolidated State Budget for 2005	2004.11.30
Law on Legal Status of Government Agencies	2004.04.15
Law on Public Radio and Television	2005.01.27
Law on Oil Products	2005.07.01
Law on Tobacco Control	2005.07.01
Law on Consolidated State Budget for 2006	2005.11.18
Law on Procurement of Goods, and Services with State and Local Budget (Law on Public Procurement)	2005.12.01
Law on Patent	2006.01.19
Law on State Great Khural	2006.01.26
Law on Toxic and Hazardous Chemicals	2006.05.25
Law on Financial Leasing	2006.06.22
Law on Income Tax of Economic Enterprises / on Corporate Income Tax	2006.06.29
Law on Excise (revised)	2006.06.29
Law on Government Special Fund	2006.06.29
Law on Minerals	2006.07.08
Law on Consolidated State Budget for 2007	2006.11.30
Law on Science and Technology	2006.12.28
Law on Renewable Energy	2007.01.11
Law on Living Modified Organisms	2007.06.28
Law on Railway Transportation	2007.07.05
Law on State Reserve	2007.07.05
Law on Small and Medium-sized Enterprises	2007.07.27
Law on State Great Khural Session Order	2007.10.11
Law on Protection of Plants	2007.11.15
Law on Consolidated State Budget for 2008	2007.11.30
Law on Customs Tariffs and Tax	2008.05.20
Law on Customs	2008.05.20
Law on General Taxation	2008.05.20
Law on Occupational Safety and Health	2008.05.22
Law on Preschool Education	2008.05.23
Law on Urban Development	2008.05.29
Law on Consolidated State Budget for 2009	2008.11.27
Law on Vocational Education and Training (revised)	2009.02.13
Law on Nuclear Energy	2009.07.16
Law on Prohibition of Mineral Exploration and Exploitation in Run-off Source Areas, Protection Zones of Water Bodies and Forested Areas	2009.07.16
Law on Consolidated State Budget for 2010	2009.11.27
Law on Legal Status of Industrial and Technological Parks	2009.12.17
Law on Concessions	2010.01.28
Law on Competition	2010.06.10
Law on Prohibiting Issuance of New Exploration Licences for Mining	2010.06.17

Law on Air Pollution Fees	2010.06.24
Law on Fiscal Stability	2010.06.24
Law on Consolidated State Budget for 2011	2010.11.25
Law on State Stamp Duties	2010.11.25
Law on Promotion of Gender Equality	2011.02.02
Law on Health	2011.05.05
Law on Information Transparency and Right to Information	2011.06.16
Law on Driver's Insurance	2011.10.06
Law on Use of Water Supply and Sewerage System in Urban and Settlement Areas	2011.10.06
Law on Consolidated State Budget for 2012	2011.11.30
Law on Integrated Budget	2011.12.23
Law on Social Welfare	2012.01.19
Law on Soil Protection and Desertification Prevention	2012.05.17
Law on Water (revised)	2012.05.17
Law on Water Pollution Fees	2012.05.17
Law on Forests (revised)	2012.05.17
Law on Fauna	2012.05.17
Law on Environmental Impact Assessment	2012.05.17
Law on Air (revised)	2012.05.17
Law on Fees for Use of Natural Resources	2012.05.17
Law on Innovation	2012.05.22
Law on Consolidated State Budget for 2013	2012.11.08
Law on Food	2012.12.20
Law on Ensuring the Safety of Food Products	2012.12.20
Law on Control and Circulation of Explosive Substances and Blasting Instruments	2013.01.31
Law on Investment	2013.10.03
Law on Consolidated State Budget for 2014	2013.11.15
Law on Minerals of Common Occurrence	2014.01.09
Law on Protection of Cultural Heritage	2014.05.15
Law on Glass Accounts	2014.07.01
Law on Consolidated State Budget for 2015	2014.11.14
Law on Oil	2014.07.01
Law on Free Zones	2015.02.12
Law on Legislation	2015.05.29
Law on General Administrative Procedures	2015.06.19
Law on Re-development of Urban and Settlement Area	2015.06.26
Law on Fire Safety (revised)	2015.07.02
Law on Road Traffic Safety	2015.07.08
Law on Public Hearing	2015.07.08
Law on Value Added Tax (revised)	2015.07.09
Law on Industry Support	2015.07.09
Law on Firearms (revised)	2015.08.07
Law on Firearms Tax	2015.08.07
Law on Consolidated State Budget for 2016	2015.11.13
Law on Development Policy Planning	2015.11.26
Law on Energy Efficiency	2015.11.26
Criminal Code (revised)	2015.12.03
Law on Crop Production (revised)	2016.01.29
Law on Hygiene (revised)	2016.02.04
Law on Decision on Administrative Cases in Court (revised)	2016.02.04
Law on the Rights of the Child	2016.02.05
Law on Value Added Tax Exemption	2016.02.05
Law on Construction (revised)	2016.02.05
Law on Organic Food	2016.04.07
Law on Government Structure	2016.07.21
Law on Cabinet Member Composition	2016.07.21
Law on Defence (revised)	2016.09.01
Law on Military Service and Legal Status of Military Officers	2016.09.01
Law on Consolidated State Budget for 2017	2016.11.10
Law on State and Official Secrets	2016.12.01
Law on Domestic Violence	2016.12.22
Law on Border (revised)	2016.12.28
Law on Disaster Protection (revised)	2017.02.02

Law on Police Service (revised)	2017.02.09
Law on Referendum	2017.02.10
Law on Development Bank (revised)	2017.02.10
Law on Roads	2017.05.11
Law on Violation (revised)	2017.05.11
Law on Waste Management (revised)	2017.05.17
Law on Waterway Transportation (revised)	2017.05.25
Law on Standardization, Technical Regulation and Conformity Assessment Confidentiality (revised)	2017.12.21

## II. Decrees of the Presidium of the People's Great Khural of the Mongolian People's Republic, Presidential Decrees

Decree of the Presidium of the People's Great Khural of the Mongolian People's Republic to establish some ministries (Ministry of Environmental Protection)	1987.12.09.169
President's decision to support the initiative to worship nature and the environment	1991.05.25.84
President's decision to support the initiative to restore the tradition to worship Bogd Khan, Khan Khentii and Otgontenger Mountains	1995.05.16.110
President's decree to inherit and promulgate the long song	2004.09.01.134
President's decree on state khan fiddle	2005.05.11.77
President's decree to start state worship of Suvarga Khairkhan, Khan Huhii, Sutai Khairkhan Mountains	2007.07.26.183
President's decree to endorse the regulation (ceremonial regulation on mountains and hills under state worship)	2009.07.07.32
President's Decree to establish National Tree Planting Day	2010.04.14.63
President's decree on Burkhan Khaldun Mountain	2010.09.20.203
President's decree to set up the state ceremony schedule of mountains with state worship	2012.10.05.181
President's decree to give guidance to the Government (to stimulate activities to implement the Programme on the Restoration of Reindeer Husbandry and Improvement of the Livelihood Conditions of the Tsaatan)	2013.03.29.42
President's decree on President's policy and action plan for 2013–2017	2013.08.29.142
President's decree to give guidance to the Government (to establish and maintain garden parks in Ulaanbaatar, cities, towns and aimag and soum centres)	2013.11.25.178
President's decree to give guidance to the Government (to enhance adaptation to the new climate conditions, provide information to citizens, the public, schools at all levels and education entities, including training on the curriculum)	2014.09.16.121
President's decree to give guidance to the Government (to implement the Law on Soil Protection and Desertification Prevention)	2016.12.02.158

## III. Resolutions of the State Great Khural

Resolution of the State Great Khural to include some areas in state protection (Lake Uvs and its basin)	1993.11.12.83
Resolution of the State Great Khural on some actions to implement the Law on Special Protected Areas	1994.11.15.81
Resolution of the State Great Khural on some actions to implement the Law on Amendment of the Law on Underground Wealth	1994.12.23.96
Resolution of the State Great Khural to implement some actions in connection with joining an international convention (Mongolia joined the "Convention on International Trade in Endangered Species of Wild Fauna and Flora" adopted in Washington DC on 3 March 1973)	1995.05.04.24
Resolution of the State Great Khural to renew the classification of state protected areas (Great Gobi National Park including some parts of Gobi-Altai, Bayankhongor and Khovd Aimags)	1995.05.04.26
Resolution of the State Great Khural on some actions to implement a package of laws on the environment	1995.05.12.31
Resolution of the State Great Khural to take some areas under state protection (Nomgon, Bayan-Ovoo of Umnugobi Aimag)	1996.05.28.43
Resolution of the State Great Khural on some actions to implement the Law on Prevention of Forest and Steppe Fires	1996.05.28.45
Resolution of the State Great Khural on some actions on the environment	1997.06.05.43
Resolution of the State Great Khural to take some areas under state protection (Renchinlkhumbe Soum of Huvsgul Aimag)	1997.06.13.47
Resolution of the State Great Khural on the State Policy on Ecology	1997.12.26.106

Resolution of the State Great Khural on some actions to implement the Law on Environmental Impact Assessment	1998.01.22.20
Resolution of the State Great Khural to take some areas under state protection (Noyonkhangai Arkhangai Aimag)	1998.04.09.28
Resolution of the State Great Khural to endorse a national programme (National Programme on Special Protected Areas)	1998.04.09.29
Resolution of the State Great Khural on some actions in accordance with the amendments to the Law on Hunting related to hunting and utilization of elks	1998.10.09.107
Resolution of the State Great Khural to upgrade the status of Hustai Nature Reserve to National Park	1998.11.12.115
Resolution of the State Great Khural on some actions to implement some laws (to adopt a regulation on environmental protection, collection of income to spend on environmental restoration, spending and reporting principles)	2000.01.28.18
Resolution of the State Great Khural to take some areas under state protection (Aldarkhaan, Ider, Bulnai, Zavkhan Aimag)	2000.04.14.29
Resolution of the State Great Khural to endorse the programme on restoration of the timber production sector, and the programme of measures to address employment and social issues of the village population in the area	2000.04.14.30
Resolution of the State Great Khural to endorse the National Programme for Red Deer	2000.04.14.31
Resolution of the State Great Khural on some actions on the environment (develop drafts to amend environmental, minerals and underground wealth laws to submit to the State Great Khural)	2000.10.26.38
Resolution of the State Great Khural to create the title of environmental sector emeritus	2001.04.05.27
Resolution of the State Great Khural to endorse the Regional Development Concept of Mongolia	2001.06.14.57
Resolution of the State Great Khural to endorse the State Policy on Public Health	2001.11.08.81
Resolution of the State Great Khural to take some areas under state protection (Tujiiin Nars area classified as National Park)	2002.06.28.39
Resolution of the State Great Khural to take some areas under state protection (Khugnu-Tarnyn National Park)	2003.06.19.30
Resolution of the State Great Khural to take some areas under state protection (Shiliin Bogd Mountain, Khurgu Valley areas classified as monuments)	2004.04.29.22
Resolution of the State Great Khural to endorse the Governmental Action Plan	2004.11.05.24
Resolution of the State Great Khural on some actions on the environment (to implement laws on the environment)	2005.01.13.3
Resolution of the State Great Khural to endorse Mongolian Millennium Development Goals	2005.04.21.25
Resolution of the State Great Khural to endorse general guidance (general guidance to improve the laws up to 2008)	2005.04.21.26
Resolution of the State Great Khural to take some areas under state protection (Border of the Orkhon River Valley National Park)	2006.04.20.26
Resolution of the State Great Khural to approve amendment to the resolution and and renew the annex to the resolution (revise some article, parts of the MDG)	2008.01.31.13
Resolution of the State Great Khural to endorse the Governmental Action Plan for 2008–2012	2008.11.21.35
Resolution of the State Great Khural to endorse the State Policy Towards Herders	2009.06.04.39
Resolution of the State Great Khural to endorse the State Policy on Radioactive Minerals and Nuclear Energy	2009.06.25.45
Resolution of the State Great Khural on some actions due to endorsement of the Law on Prohibition of Mineral Exploration and Mining Operations at Headwaters of Rivers, in Protected Zones of Water Reservoirs and Forested Areas	2009.07.16.55
Resolution of the State Great Khural to endorse the State Policy on Public–Private Partnerships	2009.10.15.64
Resolution of the State Great Khural to take some areas under state protection (Tsetsen-Uul, Santmargats, Zavkhanmandal of Zavkhan Aimag)	2010.01.14.06
Resolution of the State Great Khural to endorse the National Mongolian Livestock Programme	2010.05.20.23
Resolution of the State Great Khural to endorse the Water National Programme	2010.05.20.24
Resolution of the State Great Khural to endorse the National Security Concept of Mongolia	2010.07.15.48
Resolution of the State Great Khural to endorse the National Action Programme on Climate Change	2011.01.06.02
Resolution of the State Great Khural to take some areas under state protection (Choirin Bogd Uul Mountain)	2011.01.20.04
Resolution of the State Great Khural on the Foreign Policy Concept	2011.02.10.10

Resolution of the State Great Khural on some actions due to the endorsement of the Law on Reduction of Air Pollution in the Capital City	2011.02.10.11
Resolution of the State Great Khural to take some areas under state protection and renewal of border line of some state protected areas (Zed-Khantai-Buteel Lakes)	2011.05.05.18
Resolution of the State Great Khural to endorse the State Policy and Programme on Disaster Protection	2011.05.13.22
Resolution of the State Great Khural to endorse the State Policy on Petroleum for the period until 2017	2011.12.23.65
Resolution of the State Great Khural to endorse the Governmental Action Plan for 2012–2016	2012.09.18.37
Resolution of the State Great Khural to renew the border line of some special protected areas (“Tuul junction” of the Bogdkhan Mountain National Park, Gorkhi-Terelj natural area of the Khan-Khentii Special Protected Area)	2012.05.18.38
Resolution of the State Great Khural to take some areas under state protection (Chingeltei Khairkhan Mountain area of Ulaanbaatar’s Chingeltei district)	2012.05.22.56
Resolution of the State Great Khural to take some areas under state protection (some parts of Eruu, Khuder Soums of Selenge Aimag, Erdene Soum of Tuv Aimag)	2012.05.23.57
Resolution of the State Great Khural to endorse the State Policy on the Minerals Sector	2014.01.16.18
Resolution of the State Great Khural to endorse the Green Development Policy	2014.06.13.43
Resolution of the State Great Khural to endorse the State Education Policy	2015.01.29.12
Resolution of the State Great Khural on the State Policy on Forests	2015.05.14.49
Resolution of the State Great Khural to endorse the State Energy Sector Policy	2015.06.19.63
Resolution of the State Great Khural to take some areas under state protection (Noyon Uul Mountain)	2016.02.04.13
Resolution of the State Great Khural to endorse Mongolia Sustainable Development Vision 2030	2016.02.05.19
Resolution of the State Great Khural to endorse Measures for Earthquake Prevention and Risk Reduction	2016.04.14.34
Resolution of the State Great Khural to take some areas under state protection (Tost, Toson Bumbyn Range)	2016.04.14.35
Resolution of the State Great Khural to endorse Governmental Action Plan for the period 2016–2020	2016.09.09.45
Resolution of the State Great Khural to change the name of Khentii Khaan Mountain	2017.02.09.20

#### **IV. Resolutions of the Standing Committee of the State Great Khural**

Resolution of the Standing Committee on Environment, Food and Agriculture to provide guidance (related to Huvsgul Lake)	2013.02.25.05
Resolution of the Standing Committee on Environment, Food and Agriculture to take actions to protect the Mazaalai bear	2013.05.30.16
Resolution of the Standing Committee on Environment, Food and Agriculture to clean Mongolian forests	2014.01.15.04
Resolution of the Standing Committee on Environment, Food and Agriculture to strengthen the capability of nature reserve joint management partnership	2015.07.09.7
Resolution of the Standing Committee on Environment, Food and Agriculture to provide guidance to the Government (on Tuul River)	2016.11.23.03
Resolution of the Standing Committee on Social Policy, Education, Culture and Science on taking actions to reduce and prevent sexually transmitted infectious diseases and HIV infection (concerning customers of hotels, motels, tourist camps and resorts)	2016.12.14.04
Resolution of the Standing Committee on Environment, Food and Agriculture to provide guidance to the Government (renew the registration of abandoned areas used for mining and land restoration issues)	2016.12.21.05
Resolution of the Standing Committee on Social Policy, Education, Culture and Science on taking actions to reduce, constrain and prevent tuberculosis, sexually transmitted diseases and HIV infection	2016.04.05.10
Resolution of the Standing Committee on Complaints and Petitions to provide guidance to the Government (to ensure the implementation of environmental laws)	2016.01.12.16
Resolution of the Standing Committee on Environment, Food and Agriculture to provide guidance to the Government (to reduce air pollution)	2017.01.03.01
Resolution of the Standing Committee on Environment, Food and Agriculture to provide guidance to the Government (concerning pollution of the Tuul River)	2017.02.01.02

**V. Government resolutions, regulations and rules endorsed by resolutions**

Government resolution to approve a programme and establish a centre (National Programme on Non-formal Education Development)	1997.05.07.116
Government resolution on measures to implement the Law on Land Fees	1997.06.25.152
Government resolution to approve the National Programme for Public Ecological Education	1997.12.24.255
Government resolution to approve a programme (National Programme on Waste Reduction)	1999.03.24.50
Government resolution to approve a programme and plan (Air Protection Programme)	1999.05.25.82
Government resolution to approve a regulation (procedures for issuing licences for the import, manufacture, sale and use of ozone-depleting substances)	1999.06.23.104
Government resolution to approve a national programme (National Ozone Layer Protection Programme)	1999.08.25.129
Government resolution to approve “100,000 solar homes” programme to supply rural areas with renewable energy	1999.10.06.158
Government resolution on amending a programme (National Forest Programme)	2001.10.31.248
Government resolution on National Programme for Distance Education	2002.01.25.14
Government resolution to approve an action plan (Mongolian National Action Plan for the Protection and Sustainable Use of Threatened Plants)	2002.05.29.105
Government resolution to approve rule (Rule on Classification, Collection, Temporary Storage, Transportation and Treatment of Hazardous Wastes)	2002.7.3.135
Government resolution to approve a programme and plan (Programme for Development of Water, Climate and Environmental Monitoring for the period until 2015)	2002.09.09.182
Government resolution to approve a programme (supporting development of intensive livestock farming)	2003.06.24.160
Government resolution to approve a general plan (Master Plan for Land Management)	2003.12.24.264
Government resolution on a national programme and its implementation (Green Belt National Programme)	2005.03.09.44
Government Resolution on Health Sector Strategic Master Plan	2005.04.13.72
Government resolution on the National Programme on Environmental Health	2005.12.14.245
Government resolution to support Extractive Industries Transparency Initiatives	2006.01.04.1
Government resolution to define area per ranger	2006.04.19.87
Government resolution to approve a list (List of Prohibited or Limited Use Toxic and Dangerous Chemicals in Mongolia)	2007.04.11.95
Government resolution on activities to purposely have an impact on the climate (Programme on Development of Activities to Have Deliberate Impact on the Weather for the period until 2015)	2007.04.11.96
Government resolution to approve a programme (Programme on the Restoration of Reindeer Husbandry and Improvement of the Livelihood Conditions of the Tsaatan)	2007.10.03.225
Government resolution to approve a programme and plan (“Transit Mongolia” Programme)	2008.05.14.183
Government resolution to approve a programme (National Programme for the Protection and Farming of Fish)	2008.06.25.267
Government resolution to approve a programme (National Programme for Food Security)	2009.02.04.32
Government resolution to approve a regulation (Forest Fund Agreement)	2009.07.22.227
Government resolution to approve a regulation (incentives for citizens, entities, enterprises and organizations for introducing advanced technology and methods to lessen negative impact on forests)	2010.03.10.59
Government resolution to approve a national programme (Sea Buckthorn National Programme)	2010.03.10.60
Government resolution to approve a regulation and list (development, use, collection and dissemination of environmental database, and detailed list of its sources)	2010.04.07.85
Government resolution to approve the national programme to combat desertification (National Action Programme to Combat Desertification)	2010.04.14.90
Government resolution on transit of modified living organisms through border ports	2010.06.23.158
Government resolution on taking some actions to reduce pollution of Orkhon River	2010.10.13.264
Government resolution to approve a regulation and fees (air pollution charges and fees)	2010.10.20.273
Government resolution to approve new quotas for assessment, charges and fees (ecological-economic valuation of wild animals, charges for using wild animal resources, fees for hunting and capturing wild animals)	2011.01.25.23
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2011	2011.03.21.65
Government resolution on quotas and charges (quotas and charges for air pollution by stationary sources based on the quantity of air pollutants emitted by the source)	2011.03.22.92



Government resolution on amendments to the resolution's annex (added a provision to the 2nd annex "List of toxic chemicals and hazardous substances to be restricted for use in Mongolia" of the Government resolution No. 95 dated 11 April 2011)	2011.06.08.176
Government resolution on percentage and amount of state stamp duty	2011.06.29.199
Government resolution on falcon export quotas	2011.08.17.251
Government resolution to approve a programme (National Programme for the Conservation of Rare and Endangered Species)	2011.09.21.277
Government resolution to approve revised ecological-economic value of water	2011.10.26.302
Government resolution to approve regulations on providing energy cost stimulation to ger district households to improve air quality of capital city and on incentives for citizens, entities, enterprises and organizations for reducing air pollution and reducing energy consumption	2011.11.02.309
Government resolution to approve a common regulation (internal monitoring (self-monitoring) for entities)	2011.11.09.311
Government resolution to approve an action plan (action plan to implement the first stage of the National Action Programme on Climate Change endorsed by resolution No. 2 of the State Great Khural on 6 January 2011)	2011.11.09.317
Government resolution on establishing State-owned enterprises (fresh water reserve, environmental protection centre)	2011.11.09.316
Government resolution on establishing State-owned enterprises ("Mongol Us" State-owned enterprise responsible for water resource management, State-owned or State-funded water facilities, including the use and maintenance of major water facilities)	2011.11.23.335
Government resolution to approve the plan to reduce air pollution in the capital city	2011.11.30.342
Government resolution to approve a regulation on disaster warning	2011.11.30.339
Government resolution to approve a regulation on mobilization of resources and evacuation during disaster situation	2011.11.30.340
Government resolution to approve a programme (National Programme on Healthy Cities, Districts, Soums, Workplaces and Schools)	2011.12.16.359
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2012	2011.12.21.363
Government resolution on national general plan on forest management	2011.12.21.362
Government resolution on implementing a National Animal and Plant Institute	2012.01.04.4
Government resolution to approve the list of rare species	2012.01.11.7
Government resolution to approve a plan (Implementation Plan of the State Policy and Programme on Disaster Protection)	2012.02.01.30
Government resolution on establishing protective borders of the headwaters of rivers and protected zone of forested areas on Mongolian territory	2012.06.05.194
Government resolution on quota of Saker falcon population to be exported in 2012	2012.06.05.195
Government resolution to approve a national programme (to implement the first stage of the Khatan Tuul National Programme and Action Plan (2012–2016))	2012.06.13.203
Government resolution on proposal to reduce the water supply service costs of ger district households (in Ulaanbaatar and other towns to the level of costs paid by people living in residential apartments)	2012.06.13.209
Government resolution on some regulations for the Extractive Industries Transparency Initiative	2012.07.04.222
Government resolution on river basin administration (establishment and operation of river administrations)	2012.07.25.254
Government resolution on sizes and location of forest areas of aimags and intersoum forest protection units	2012.07.25.255
Government resolution on closing down some government implementing agencies (Forest Agency, Water Agency)	2012.08.27.6
Government Resolution on approval of the local budget methods (General local development fund and method for calculating grant transfer from LDF)	2012.09.15.30
Government resolution on establishing a State-owned enterprise (Forest Research and Development Centre)	2012.10.13.89
Government resolution on abolishing the full-time position of Secretary of the Forest National Committee and Council on Toxic Chemicals and Hazardous Substances and transferring the duties to the units and officials of the ministry in charge of these issues	2012.11.03.117
Government resolution on amendments to the "List of toxic chemicals and hazardous substances to be restricted for use in Mongolia" (acetic acid)	2012.12.01.145
Government resolution to approve a program (Programme on Support of Building Materials)	2012.12.15.171
Government resolution on structure and staffing (Environmental Protection Fund)	2012.12.22.189

Government resolution to ban export (banning export of Saker falcons to foreign countries for commercial gain for the period of five years)	2013.01.12.15
Government resolution on actions to reduce air pollution	2013.01.19.18
Government resolution on endorsing strategic plan (Mid-term Strategy and Action Plan for Implementation of the Law on Promotion of Gender Equality for the period 2013–2016)	2013.01.26.34
Government resolution on terminating the regulation of water resources management during droughts, desertification and aridity	2013.03.21.65
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2013	2013.03.16.92
Government resolution to approve a regulation (Regulation on operation of specialized professional entity in charge of hunting and regulation of issuing licences for hunting and capturing rare animals)	2013.03.16.93
Government resolution on observing World Environment Day in Mongolia, 1–5 June 2013	2013.03.16.94
Government resolution to revise and approve a regulation (forest management)	2013.03.22.105
Government resolution to revise and approve a regulation and list (forest and steppe fires)	2013.03.22.106
Government resolution on a list (forest fund to be leased on contract)	2013.06.15.213
Government resolution on a list (list of afforestation, planting and timber labour and services to be exempt from value added tax, list of imported timber and wood products to be exempt from value added tax, list of imported timber and wood products to be exempt from customs tax)	2013.06.22.230
Government resolution on some actions on special protected areas	2013.07.09.259
Government resolution on amendment to the resolution (amendment to the resolution No. 92 of 16 March 2013 on quotas for hunting and capturing wild animals in 2013)	2013.08.16.297
Government resolution to make amendment in the resolution	2013.08.23.302
Government resolution to approve a list (environmentally friendly equipment and tools)	2013.08.23.303
Government resolution on fees for using water resources	2013.09.21.326
Government resolution on amendment to the resolution (water usage estimation approved by the 2nd annex of Government resolution No. 302 of 26 October 2011)	2013.09.21.327
Government resolution to take land for special needs (establish a 100-metre protection zone around hydrology, meteorology and environmental monitoring areas and prohibit any activities that might interfere with survey and monitoring)	2013.10.12.343
Government resolution to control border line (taking actions to monitor protection borders of headwaters of rivers, protected zones of water reservoirs and forested areas and to correct any errors that have occurred in defining the borders)	2013.10.19.350
Government resolution on proclaiming the Burkhan Khaldun Mountain the symbol of the Mongolian nation and name it “the Mountain of national glory”	2013.11.02.364
Government resolution on a regulation (Regulation on strategic environmental assessment, cumulative impact assessment and environmental impact assessment)	2013.11.16.374
Government resolution to approve a plan (National Integrated Water Resources Management Plan of Mongolia)	2013.11.30.389
Government resolution on transferring certain duties and responsibilities of the ministry performed under the Law on Water to the “Mongol Us” State-owned enterprise on a contractual basis	2013.11.30.390
Government resolution on transferring construction of wells and structures of the central water supply built by State-owned and State-funded funds, and construction of irrigation systems for irrigation and distribution of water resources generated by State-owned public funds, to the balance sheet of “Mongol Us” State-owned enterprise, transferring the main water supply and treatment facilities of the central water supply to the ownership of the joint venture	2013.11.30.391
Government resolution on regulation (procedures for estimating the amount of reimbursement to water users for exploration and surveying of groundwater resources surveyed by the state budget)	2014.01.18.12
Government resolution on closing down the Ugii Lake Water Information and Training Centre State-owned enterprise	2014.01.28.19
Government resolution on a programme (National Programme on Forest Tending)	2014.02.07.30
Government resolution on a revised regulation (Nature protection and rehabilitation)	2014.02.14.43
Government resolution on assigning protection administration duties to non-government organization (Hustai Nuruu Range National Park)	2014.02.21.49
Government resolution on determination of border points (of state special protected areas, nature reserves and natural monuments)	2014.02.21.50
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2014	2014.04.1.122

Government resolution on a national programme (Waste Management Improvement Programme)	2014.09.18.298
Government resolution on fees for using timber and fuelwood for personal needs and ecological-economic assessment of forest resources	2014.09.18.307
Government resolution on transferring some duties (closing down the Land Modernization Committee and Water National Committee Working Groups)	2014.10.11.323
Government resolution on a national programme (National Programme on Persistent Organic Pollutants and its Implementation Plan)	2014.10.18.341
Government resolution on membership of environmental protection international committee	2014.10.25.350
Government resolution on proclaiming the “Flower of national glory” (Scabiosa)	2014.10.25.355
Government resolution on amendment to the list of goods prohibited or requiring a licence for transit through the state border	2014.12.01.378
Government resolution on amendment to the list of goods requiring a licence for transit through the state border	2014.12.01.379
Government resolution on approval of strategies and restructuring programmes of ministries	2014.12.30.402
Government resolution on some institutional arrangements for budgetary bodies	2015.02.09.55
Government resolution to amend the resolution on quotas for hunting and capturing wild animals for special purpose in 2015	2015.04.27.164
Government resolution on the national strategy on ensuring road traffic safety	2012.05.02.146
Government resolution to approve a regulation (incentives for citizens, entities, enterprises and organizations engaged in introducing waste reduction, collection, transportation, storage, recycling, reclamation and disposal, or introducing non-waste technology)	2015.06.29.263
Government resolution to approve a list (list of hazardous wastes)	2015.06.29.264
Government resolution to approve a regulation, lists and schedule (regulation of early warning of climate and environmental disasters, list of natural disasters, list of data on environmental contamination during emergencies and industrial accidents, public radio and television weather broadcast schedule, regulation on drought and dzud status assessment)	2015.07.07.286
Government resolution on waste disposal methodology	2015.07.07.288
Government resolution on amendment to the resolution annex (changing coordinates of borders of headwaters of rivers, protected zones of water reservoirs and forested areas on Mongolian territory)	2015.07.07.289
Government resolution on amendment to the resolution annex (changing coordinates of borders of headwaters of rivers, protected zones of water reservoirs and forested areas)	2015.07.20.302
Government resolution to approve a programme (National Programme of Community Participatory Disaster Risk Reduction and its Implementation Plan)	2015.07.20.303
Government resolution on closing down the National Tourism Centre State-owned enterprise	2015.07.27.310
Government resolution to approve a programme (National Tourism Development Programme)	2015.08.04.324
Government resolution on a national programme (National Biodiversity Programme)	2015.08.04.325
Government resolution on amendment to the resolution annex (construction of 7 km road to the Aglag Monastery)	2015.08.17.334
Government resolution to approve a plan (National Plan for Prevention and Rescue of the Population, Animals and Properties from Disaster, Disaster Response and Early Recovery)	2015.10.19.416
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2016	2015.11.23.463
Government resolution on taking land into state special need (obtaining 6132.6 hectares of land for state special needs to construct a highway between Ulaanbaatar and Khushigt Valley international airport and defining coordinates)	2015.12.14.487
Government resolution on closing down working offices of the Clean Air Fund, National Committee on Biosafety, National Committee on Soil Protection and Combating Desertification, National Committee on Climate Change, and National Council on Toxic Chemicals and Hazardous Substances, and transferring duties to the Ministry of Environment, Green Development and Tourism	2015.12.21.501
Government resolution on a programme (National Programme on Urbanization and Health)	2016.01.04.4
Government resolution on Action Plan for the Implementation of the Green Development Policy	2016.01.11.35
Government resolution on amending an annex (changing the land sizes and location of forest areas of the intersoum forest protection units to be formed in the capital city and aimags)	2016.02.01.79
Government resolution on changing the coordinates of borders of headwaters of rivers, protected zones of water reservoirs and forested areas on Mongolian territory	2016.03.14.155
Government resolution on approving model template for an agreement (“environmental protection, mining exploitation, infrastructure development for construction and	2016.03.28.179

manufacturing and creating workplaces” agreements between a licence holder and local administration)	
Government resolution on membership of an international organization (Acid Deposition Monitoring Network in East Asia)	2016.05.02.237
Government resolution on membership of an international organization (Global Respect for the Global Earth Observation Mission, which is responsible for the exchange and use of comprehensive global observational data)	2016.05.02.238
Government resolution to approve an action plan (Action Plan for Earthquake Prevention and Risk Reduction)	2016.05.31.282
Government resolution on obtaining land for state special needs (area, border line coordinates of the Eg River hydro power station)	2016.05.31.285
Government resolution to approve general rules on Fire safety	2016.06.20.339
Government resolution to approve the National Quality Programme	2016.06.28.344
Government resolution to approve the organizational structure and staff numbers of ministries (Ministry of Environment and Tourism)	2016.07.27.3
Government resolution to approve the strategic action programme and restructuring of some ministries	2016.09.07.81
Government resolution to approve the strategic action programme and restructuring of some ministries (Ministry of Environment and Tourism)	2016.09.21.91
Government resolution on General Procedure of State Disaster Protection Services	2016.09.21.97
Government resolution on quotas for hunting and capturing wild animals for special purpose in 2017	2016.11.23.155
Government resolution on establishing a State-owned enterprise (Tourism Development Centre)	2017.01.04.2
Government resolution to amend the regulation on operation of the specialized professional entity in charge of hunting	2017.01.11.9
Government resolution to amend the resolution on Climate Change and International Relations Department	2017.01.11.12
Government resolution to approve the Gold-2 National Programme	2017.01.18.20
Government resolution on government commissions, committees, national councils and working groups (annex 14: National Committee on Sustainable Development, and Annex 10: National Committee on Water)	2017.01.25.27
Government resolution to approve a national programme (National Programme on Maternal and Child Health)	2017.03.07.78
Government resolution to approve a regulation (policy documents implementation and monitoring)	2017.03.15.89
Government resolution on defining border line of natural reserve land and monument (border line of Noyon Uul Mountain area in Mandal Soum of Selenge Aimag)	2017.03.20.90
Government resolution on defining border line of natural reserve land (border line of Tost, Toson Bumbyn Nature Reserve)	2017.03.20.91
Government resolution to amend a regulation (Hydrology and Meteorology Day)	2017.03.20.97
Government resolution to approve the National Programme on Reduction of Air and Environmental Pollution	2017.03.20.98
Government resolution to inform the public about land coordinates	2017.03.29.106
Government resolution on National Day of Soil Protection	2017.05.24.149
Government resolution to approve a regulation (Regulation on extraction of minerals from small-scale mines)	2017.05.24.151
Amendment and changes in the annex of the resolution (Regulations on the State Emergency Commission)	2017.05.30.152
Government resolution on excise tax on passenger cars	2017.06.09.164
Government resolution on amendment to the resolution (Disaster Protection Unit)	2017.07.04.195
Government resolution on a regulation (electricity tariff discount for ger household area)	2017.07.04.199
Government resolution on some actions for air overheating and dryness	2017.07.16.205
Government resolution to approve a programme (National Programme “Fruits and berries”)	2017.08.09.223
Government resolution to approve a national programme (National Environmental Health Programme)	2017.08.09.225
Regulation on disaster protection specialised professional unit	2017.8.17.75
Government resolution to approve a national programme (National Occupational Safety and Health Programme)	2017.08.31.243
Government resolution to take land for special needs	2017.09.13.254

Government resolution to approve a regulation (Research and survey regulation on implementing actions on mitigating adverse impact on human health to improve and protect human health)	2017.09.13.259
Government resolution to revise a regulation (incentives for citizens, economic entities and organizations that adopt environmentally friendly advanced technologies and procedures)	2017.09.27.290

**VI. Rules and regulations endorsed by the member of the Cabinet in charge of environment per se or jointly with other Cabinet members**

Order of the Minister of Environment to endorse a regulation (manage the number of wolves and eliminate wild dogs in national parks and protected areas)	1995.02.15.18
Joint order of the Ministers of Environment and of Health to approve a list (list of drug plants growing in Mongolia)	1995.10.24.139/A/148
Order of the Minister of Environment to endorse a regulation (regulation on research and survey operations in national parks and protected areas)	1996.03.15.36
Order of the Minister of Environment to endorse a regulation (air quality)	1996.07.05.98
Order of the Minister of Environment to endorse a regulation (regulation on transfer of planted forests to national forest fund)	1996.07.15.107
Order of the Minister of Nature and Environment to endorse a regulation (regulation on managing wild animal herds in state special protected areas, conducting research and surveys, sampling, measurement and adaptation, and regulation of hunting and trapping to eliminate infectious diseases)	1996.01.10.209
Joint order of the Ministers of Infrastructure, of Environment and of Health and Social Welfare to endorse a regulation setting allowable limits on the composition of industrial wastewater before releasing effluents into public sewers and central wastewater treatment systems	1997.01.10.A/11/A/18
Joint order of the Ministers of Environment, of Health and of Social Welfare to endorse a new regulation (regulation on prevention of pollution of water reserves)	1997.10.21.143/A/352
Order of the Minister of Environment on taking actions to protect some rare animals	1998.01.16.07
Order of the Minister of Environment to approve a list and pricing (list of hydrology and meteorology specified provisional and scheduled data, list of quoted prices)	1998.01.30.16
Order of the Minister of Environment to endorse a regulation (to suspend industrial production operations)	1998.06.05.77
Order of the Minister of Environment to endorse a common regulation (regulation on forming and operation of a special protected area council)	1998.09.17.112
Order of the Minister of Environment to endorse the regulation on costs of some forest operations (regulation on standard costs of forest operations per hectare)	1998.12.15.146
Joint order of the Ministers of Environment and of Finance to endorse a regulation (on planning actions to certify the condition and quality of land and financial issues)	1999.05.10.62/62
Order of the Minister of Environment to endorse a regulation (on fishing enterprises, approval of model commercial fishing contract)	1999.09.21.114
Joint order of the Ministers of Environment and of Finance to endorse a regulation (on use, dissemination, income, expenditure of income related to data from the central environmental database)	1999.12.10. 154/201
Order of the Minister of Environment to endorse a regulation (on taking land into local protection)	2000.01.10. 07
Order of the Minister of Environment to endorse a regulation (on use of mineral water springs in special protected areas)	2000.02.03.21
Order of the Minister of Environment to endorse a regulation (temporary regulation on issuing permits, using land in special protected areas, order No. 54 of 2002 to make amendments to the previous regulation of the Minister of Environment, order No. 164 of 2003 to amend some orders, order No. 244 of 2005 to amend a regulation, order No. 234 of 2008 to amend some regulations, order No. 242 of 2009 to approve the new model certificate of the Minister of Environment and Tourism, annulment of the 3rd annex)	2001.10.26.218
Order of the Minister of Infrastructure to endorse a regulation (on procedures for rating hotels and tourist camps, hotel designs, reports on hotels and tourist camps, certificates for qualifying hotels, design templates and tourist camp designs)	2002.05.15.150
Order of the Minister of Environment to endorse a new regulation (on tourism operations in special protected areas, regulation on single payment for operations and services in special protected areas, sample ticket for single payment for operations and services in special protected areas, single payment norms for operations and services in special protected areas)	2002.06.01.117
Order of the Minister of Environment to approve the Guidelines for the preparation and reporting of hazardous waste storage and disposal	2003.07.01.127

Joint order of the Ministers of Environment, of Agriculture and of Finance to endorse a regulation (common regulation on restoration and maintenance of wells and water facilities, construction of new wells and facilities, financing, ownership and use)	2005.07.15.101/189/194
Order of the Minister of Environment to endorse a regulation (on registration of water sources, guidance on registration, forms of registration of surface and underground water sources and water facilities)	2006.08.22.269
Joint order of the Ministers of Environment and of Finance to endorse a regulation (on stimulation of citizens reporting violation of environmental law or providing concrete information on violation and supporting state environmental inspectors and protection officers, through being rewarded with the income from sale of confiscated natural resources from illegal operations)	2006.10.31.342/366
Order of the Minister of Environment to endorse a regulation (on types of facilities and points for waste disposal and demolition, their requirements, operations of citizens and enterprises involved in waste disposal and demolition)	2006.12.05.404
Order of the Minister of Environment to endorse a regulation and sample (on exporting animals, raw materials, research samples and specimens to foreign countries, model permit certificate to trade rare wild animals and plants on the international market in accordance with the CITES convention, model export permit for animals and derivatives thereof)	2007.10.01.292
Order of the Minister of Environment and Tourism to endorse a regulation (on classification of tourism entities)	2009.02.09.31
Joint order of the Ministers of Environment and Tourism, of Agriculture and Food and of Health to endorse a regulation (on usage and tests of pesticides, chemical fertilizers, rodenticides, hygienic and disinfection substances)	2009.03.18.63/67/87
Joint order of the Ministers of Environment and Tourism and of Finance to approve the cost standard of afforestation and forest operations per hectare	2009.06.12.139/154
Order of the Minister of Health to approve a strategy and action plan (Strategy on Improving Waste Management of Healthcare Organizations and Action Plan for Improving Waste Management of Healthcare Organizations for the period 2009–2013)	2009.09.09.293
Joint order of the Ministers of Environment and Tourism and of Foreign Affairs to endorse a new regulation (on export, import, transit through the state border, production and trade of toxic chemicals and hazardous substances)	2009.11.16.334/104
Order of the Minister of Environment and Tourism to approve an assessment (ecological-economic assessment of one cubic metre of forest fund trees, ecological-economic assessment of forest fund covering one hectare of forest area, ecological-economic assessment of non-forest fund covering one hectare of forest area, ecological-economic assessment of one young tree)	2009.12.11.394
Order of the Minister of Environment and Tourism to approve a methodology and guidance (methodology on environmental impact assessment)	2010.01.04.A.2
Joint order of the Ministers of Environment and Tourism and of Health to endorse a regulation (on use and protection of mineral springs)	2010.03.30.A.79/99
Joint order of the Ministers of Environment and Tourism and of Energy and Mineral Resources to approve a methodology (on cost assessment of restoration of land damaged by mining operations)	2010.05.10.A.132/112
Order of the Minister of Environment and Tourism to approve a methodology (methodology on environmental damage assessment and method of estimating compensation)	2010.05.27.156
Order of the Minister of Environment and Tourism to approve regulations, model contracts and certificates (regulation on protection, usage and ownership of certain mineral resources by citizen cooperatives, model contract for citizen cooperatives on environmental protection operations, sample of citizen cooperative certificate, action plan related to citizen cooperatives' environmental protection operations)	2010.07.22.A.250
Order of the Minister of Environment and Tourism to approve the list of organic solvents and on air pollution fees	2010.10.14.305
Order of the Minister of Environment and Tourism to approve a methodology (methodology on ecological-economic assessment of damage caused by misuse of land and operations in special protected areas)	2010.10.26.A.333
Joint order of the Ministers of Nature, Environment and Tourism and of Roads, Construction and Urban Development to endorse a regulation (on classification of carbon dioxide emissions from automobiles and self-propelled vehicles and classification of vehicles based on engine power)	2011.03.07.A.63/67
Joint Order of the Minister of Environment and Tourism and the Minister of Health (rules on classification, collection, temporary storage, transportation and treatment of medical waste)	2011.09.28.A.320/305

Order of the Minister of Environment and Tourism to define air quality monitoring service pricing and fees	2011.10.10.A.342
Joint order of the Ministers of Environment and Tourism and of Health to endorse a regulation (on registration, collection, transportation, elimination, export, import, transit through the state border, production and trade of polychlorinated biphenyls)	2012.01.11.A.17/16
Order of the Minister of Environment and Tourism to approve a methodology and guidance (methodology on classification, grading of groundwater resources, contents of hydrogeology research reports, their interpretation and reference)	2012.01.17.28
Joint order of the Ministers of Environment and Green Development and of Health and of the Director of the National Emergency Management Agency to endorse a regulation and methodology (regulation and methodology on risk assessment of toxic chemicals and hazardous substances)	2012.10.25.A.50/378/565
Order of the Minister of Environment and Green Development to define payment quota for usage of forest subsidiary resources	2012.12.19.125
Joint order of the Ministers of Environment and Green Development and of Health to ban the use of acetic acid of more than 25 per cent concentration in foodstuffs	2012.12.27.A.149/447
Order of the Minister of Environment, and green Development to approve re-newed National Biosafety Committee	2013.01.03.A.03
Order of the Minister of Environment and Green Development to endorse a regulation (forest maintenance and cleaning)	2013.02.19.53
Order of the Minister of Environment and Green Development to endorse a regulation (on defining the category of droughts, desertification and aridity and the regulation on water resources management)	2013.03.01.66
Order of the Minister of Environment and Green Development to endorse a regulation (on permits for issuance of an auditor's licence, methodology of environmental audit and sample permission certificate to conduct environment audit)	2013.04.24.A.126
Order of the Minister of Environment and Green Development to endorse a regulation (on forest operations in the forest area of state special needs land)	2013.05.01.A.134
Order of the Minister of Environment and Green Development to endorse a regulation (on water usage and consumption meters)	2013.05.16.A.156
Order of the Minister of Environment and Green Development to approve water usage fees, and sample water usage certificate and contract	2013.05.16.A.157
Order of the Minister of Environment and Green Development to approve methodology for developing a water resources management basin plan	2013.06.19.A.187
Order of the Minister of Environment and Green Development to endorse rules of setting up a water basin council	2013.06.22.A.124
Order of the Minister of Environment and Green Development to endorse a regulation on the requirements and operation of professional forestry entities	2013.08.07.A.223
Order of the Minister of Environment and Green Development to endorse a regulation (on issuing a certificate of origin and exercising control, samples of timber and timber origin certificates, sample of timber operation licence or certificate)	2013.08.26.A.153
Order of the Minister of Environment and Green Development to endorse a regulation on forest maintenance and cleaning	2013.09.02.244
Order of the Minister of Environment and Green Development to approve the operational guidance and duties of professional water entities	2013.10.23.307
Order of the Minister of Environment and Green Development to endorse a regulation on travelling on Burkhan Haldun Mountain and conducting traditional customs and ceremonies	2013.12.11.361
Order of the Minister of Environment and Green Development to endorse a regulation (Procedures for public participation in environmental impact assessment)	2014.01.06.A.03
Order of the Minister of Environment and Green Development to endorse a regulation on exercising control over transactions of the special account on environmental protection and restoration operations	2014.01.06.A.04
Order of the Minister of Environment and Green Development to endorse a regulation on developing, approving and reporting of annual environmental management plans	2014.01.06.A.05
Order of the Minister of Environment and Green Development to endorse a regulation on developing indicators of the national water database and accounting	2014.03.17.A/86
Joint order of the Ministers of Environment, Green Development and Tourism and of Finance to endorse a regulation (on stimulation for forest protection and tree planting, sample of report documents on pest elimination and forest cleaning, samples of documents on tree planting, counting and transfer)	2014.03.31.A.140/63
Order of the Minister of Environment and Green Development to endorse a regulation on developing the waste database and dissemination of information	2014.04.09.115

Order of the Minister of Environment and Green Development to endorse a regulation on national registration and recording of wastes and reporting	2014.04.09.116
Order of the Minister of Environment and Green Development to endorse a regulation on environmental impact assessment	2014.04.10.A.117
Order of the Minister of Environment and Green Development to endorse a regulation on protection and efficient use of forest subsidiary resources	2014.05.12.A.166
Order of the Minister of Environment and Green Development to approve a regulation (regulation and guidance to conduct integrated state registration of air pollution sources)	2014.05.19.A.181
Joint order of the Ministers of Environment and Green Development and of Roads and Transportation to endorse a regulation (on technical and ecological inspection of vessels, registration and recording, issuing state plates, samples of certificates of vessels, samples of national plates and of dossier of vessels, their location, size, samples of technical inspection records and documents, sample of technical inspection list)	2014.06.02.138/A.208
Order of the State Secretary to approve a programme (training programme of state employees of the Ministry of Environment and Green Development, ensuring working conditions and social guarantees of state employees)	2014.06.12.A.183
Joint order of the Minister of Environment and Green Development and the Mayor of the capital city to approve a regulation on improving the quality of air	2014.07.17/23.A.263/ A.616
Order of the Minister of Environment and Green Development to approve a regulation (general rules on indexing and reporting of air quality, health impacts on the general spread of pollutants, and health advice)	2014.09.17.A/327
Order of the Minister of Environment and Green Development to endorse a new regulation (on employing environmental protection activists and stimulation based on their work achievements, samples of contracts to employ environmental protection activists, samples of identity cards and badges)	2015.02.26.A.110
Order of the Minister of Environment, Green Development and Tourism to approve creation of an entity for the project implementation	2015.02.27.A.118
Order of the Minister of Environment, Green Development and Tourism to approve a methodology (on conducting technical and biological restoration of lands damaged by mining operations)	2015.03.30.A.138
Joint order of the Ministers of Environment, Green Development and Tourism and of Construction and Urban Development to endorse a regulation (on following sanitation, special and basic protection standards at riverheads and water reservoirs)	2015.06.05.A.230/127
Order of the Minister of Environment, Green Development and Tourism to approve ecological-economic assessment (of endangered, rare and some abundant plants)	2015.07.09.A.282
Order of the Minister of Education, Culture and Science to approve the core curriculum for lower secondary education	2015.07.10.A/302
Joint order of the Ministers of Environment, Green Development and Tourism and of Health to approve classification of toxic chemicals and hazardous substances (classification of toxic chemicals and hazardous substances, methodology to use the classification of toxic chemicals and hazardous substances, list of substances related to toxic chemicals and hazardous substances)	2015.10.08.A/356/396
Joint order of the Ministers of Environment, Green Development and Tourism, of Health and of Justice to approve the list of types, brand names of firearms and ammunition for personal protection and guard duties	2015.11.03.A/250/A/379, 437
Order of the Minister of Education, Culture and Science to approve the guidelines “Key areas and requirements of incorporating and implementing the concept of ESD in the training and activities of general secondary schools”	2015.11.13.A/458
Order of the Minister of Environment, Green Development and Tourism to approve the list of ozone-depleting substances and establish quota for equipment containing ozone depleting substances	2015.12.21.A/429
Order of the Minister of Environment, Green Development and Tourism to renew fees for water use conclusions	2016.02.05.A/33
Order of the Minister of Labor to approve updated list (updated list of jobs prohibited for minors)	2016.02.8.A/36
Order of the Prime Minister to approve establishment of the working groups	2016.03.22.44
Order of the Deputy Prime Minister to approve general procedure on volunteerism in disaster management	2016.04.15.34
Order of the Deputy Prime Minister to approve Implementation Plan of the National Program for Community Participatory Disaster Risk Reduction	2016.05.06.50
Order of the Director of NEMA to approve guideline on volunteer activities for disaster protection	2016.06.24.A/185



Order of the Minister of Environment and Tourism to approve licensing for collecting and clearance of natural flora	2016.10.12.A/71
Order of the Minister of Environment and Tourism to prepare timber from forests	2016.11.23.A/111
Order of the Minister of Environment and Tourism on fishing quotas in 2016–2017 and sturgeon caviar	2016.12.02.A/122
Order of the Minister of Environment and Green Development to endorse a regulation (on timber production, sample request and contract for timber production, sample timber transportation inspection certificate, sample document recording the start and termination of timber operation, sample timber production technology certificate)	2016.12.13.A/133
Order of the General Agency for Specialized Inspection to invalidate an order (Regulation on the temporary and permanent closure of mines No. 309)	2016.12.26.A/126
Order of the Minister of Environment and Tourism to approve hunting and trapping animals for special and household purposes	2016.12.27.A/149
Joint order of the Ministers of Environment, Green Development and Tourism, of Health and of Agriculture, Food and Light Industry to approve the list of pesticides to be used in 2017 in Mongolia for plant protection purposes	2017.02.09.A/30, A.20, A/62
Order of the Minister of Environment, Green Development and Tourism to endorse a regulation and sample (certificate of origin of animals and derivatives thereof, exercising control)	2017.04.03.A/75
Order of the Minister of Environment and Tourism terminating some orders (1999.03.22.39, 2000.11.09.62/157, 2013.07.01.A/194, 2014.01.10.A/11)	2017.04.12.A/80
Order of the Minister of Environment and Tourism banning the gathering and export of shilajit for a short period	2017.04.14.A/86
Order of the Minister of Environment and Tourism to temporarily ban collection of antlers	2017.04.20.A/97
Joint order of the Deputy Prime Minister and the Ministers of Environment, Green Development and Tourism and of Health to endorse a regulation for storage, transportation, use and destruction of dangerous and toxic chemical substances	2017.05.23.54/A/136/A/215
Order of the Minister of Environment and Tourism to intensify activities for the prevention of forest fire	2017.06.14.4
Order of the Minister of Environment and Tourism to temporarily ban collection of antlers	2017.06.14.A/169
Order of the Minister of Environment and Tourism terminating an order (cooperation to implement environmental law)	2017.06.29.A/185
Order of the Minister of Environment and Tourism to approve a project steering committee and lead some environmental convention and agreements	2017.07.20.A/198
Order of the Minister of Environment and Tourism to approve the methodology (methodology for calculating waste norms)	2017.12.25.A.368

## Annex III

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<https://www.unicef.org/mongolia>

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## WHO Environmental Health

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<http://mongolia.panda.org>

## Zoological Society of London

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*Annex IV*

*Maps*

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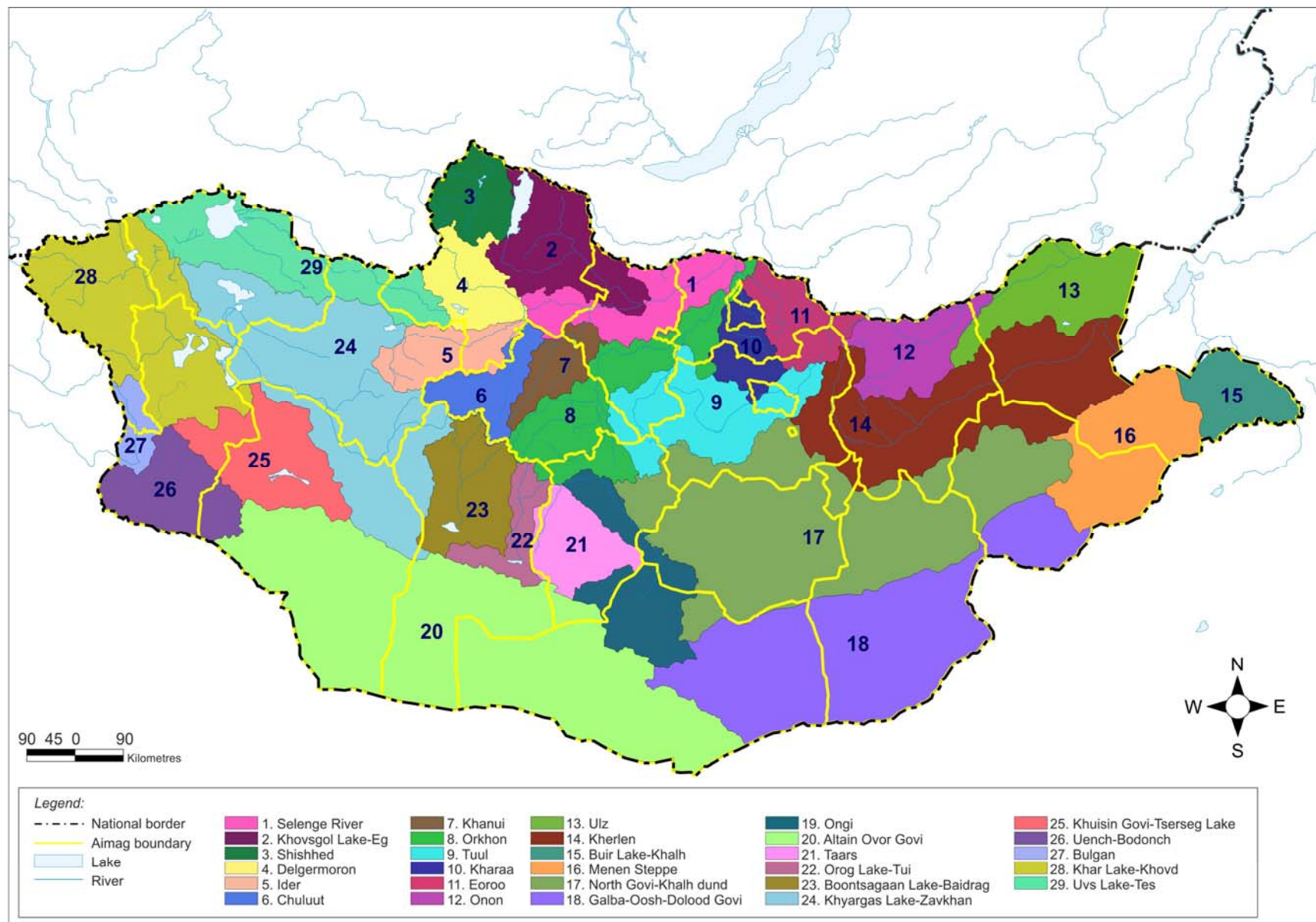
Map 1: Territorial division of Mongolia



Source: United Nations Cartographic Section, 2007.

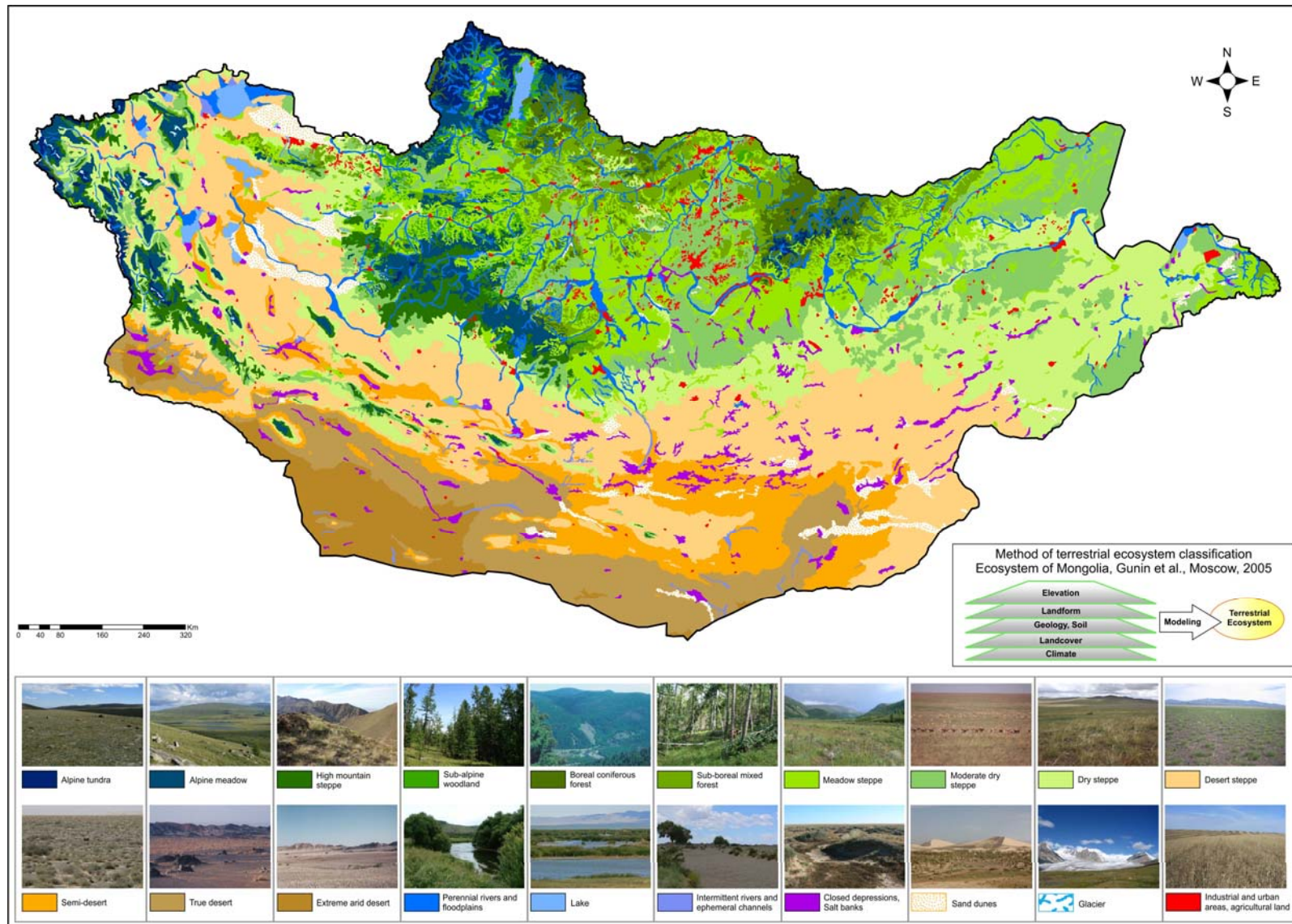
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Map 2: River catchment areas



Source: Ministry of Environment and Tourism, 2017.

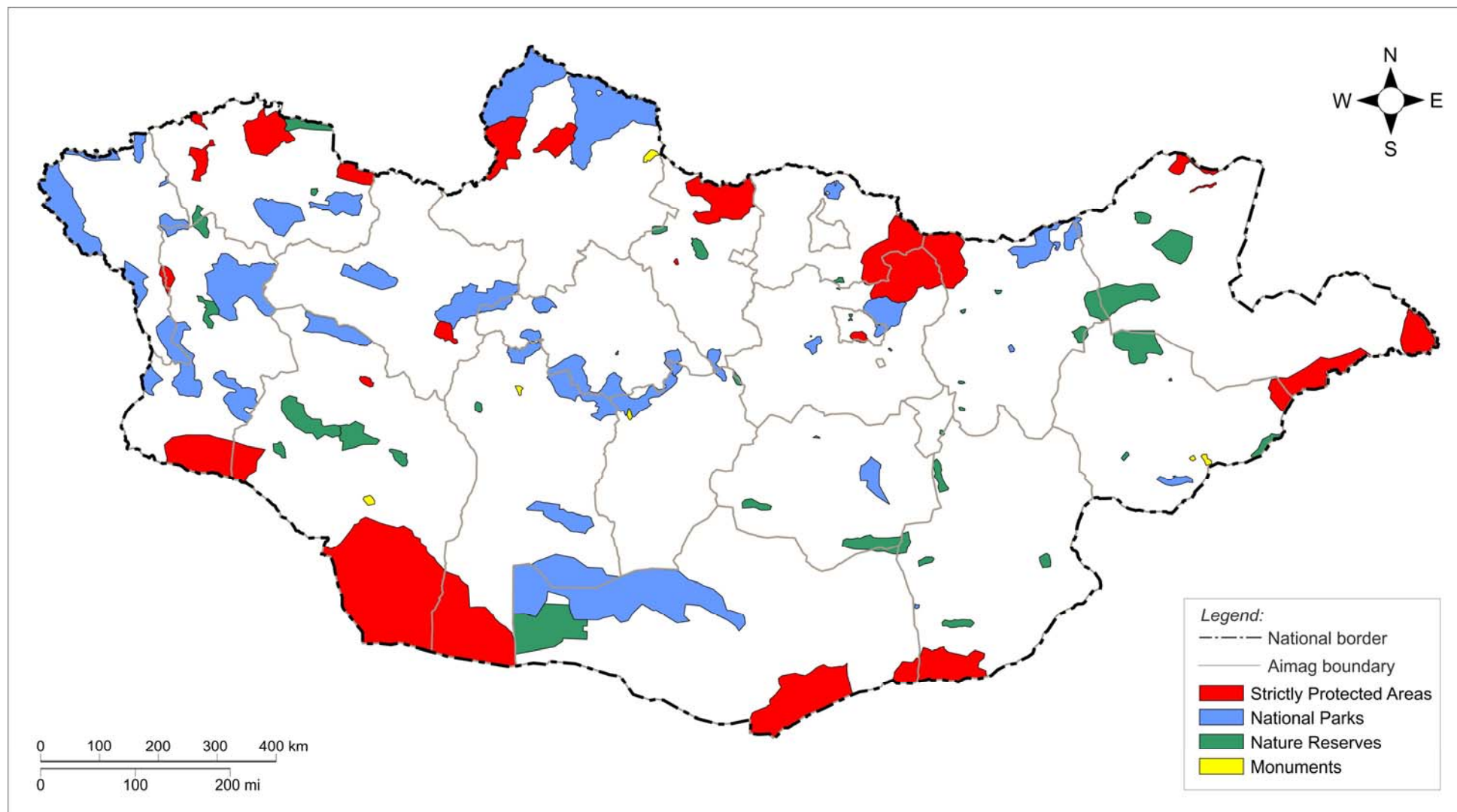
Map 3: Ecosystems



Source: WWF Mongolia, Filling the Gaps to Protect the Biodiversity of Mongolia (2010). The map is based on Gunin et al. (2005). Method of Terrestrial Ecosystem Classification: Ecosystems of Mongolia, Moscow.

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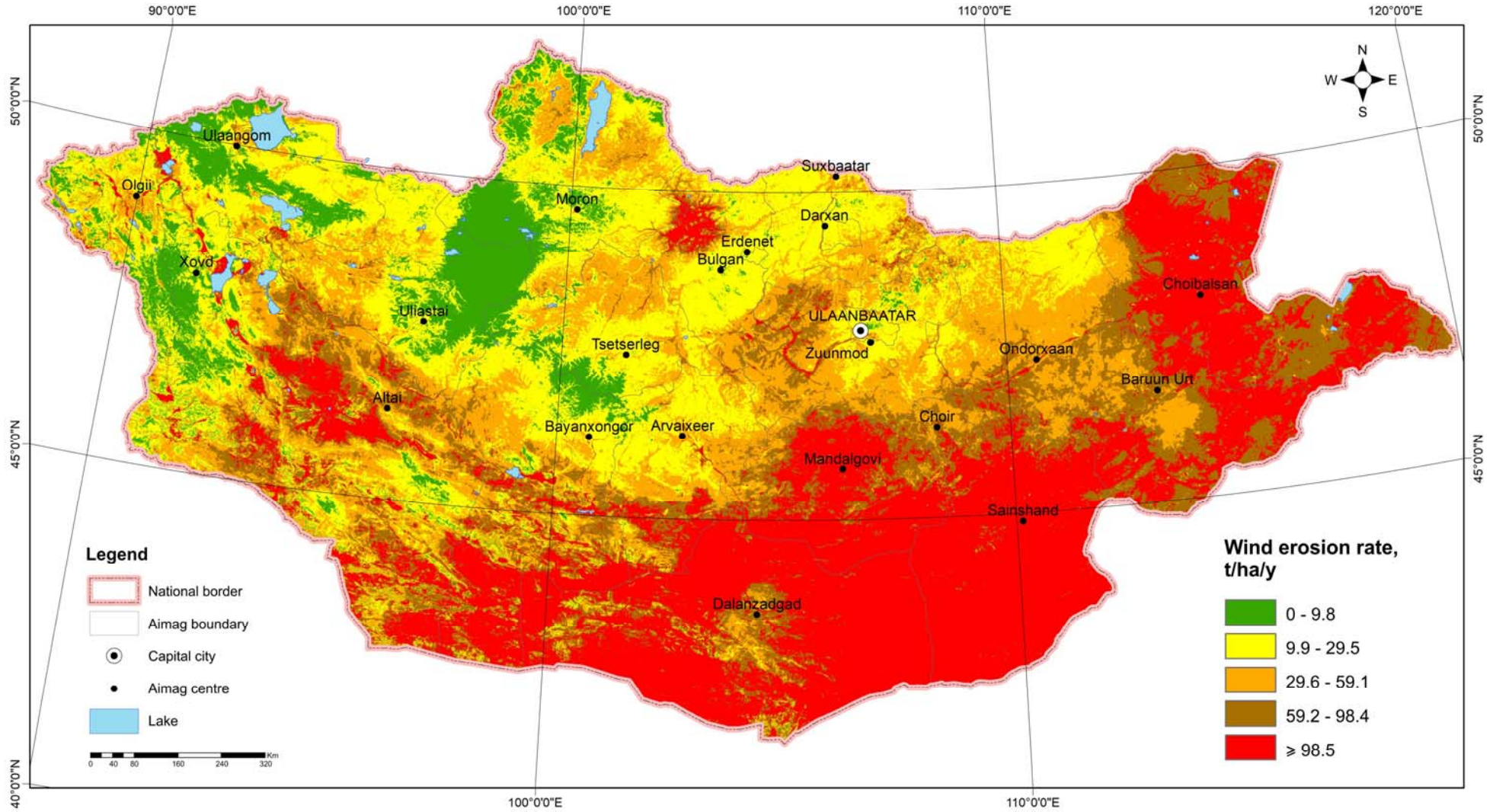
Map 4: State Special Protected Area network, 2017



Source: Ministry of Environment and Tourism, 2017.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

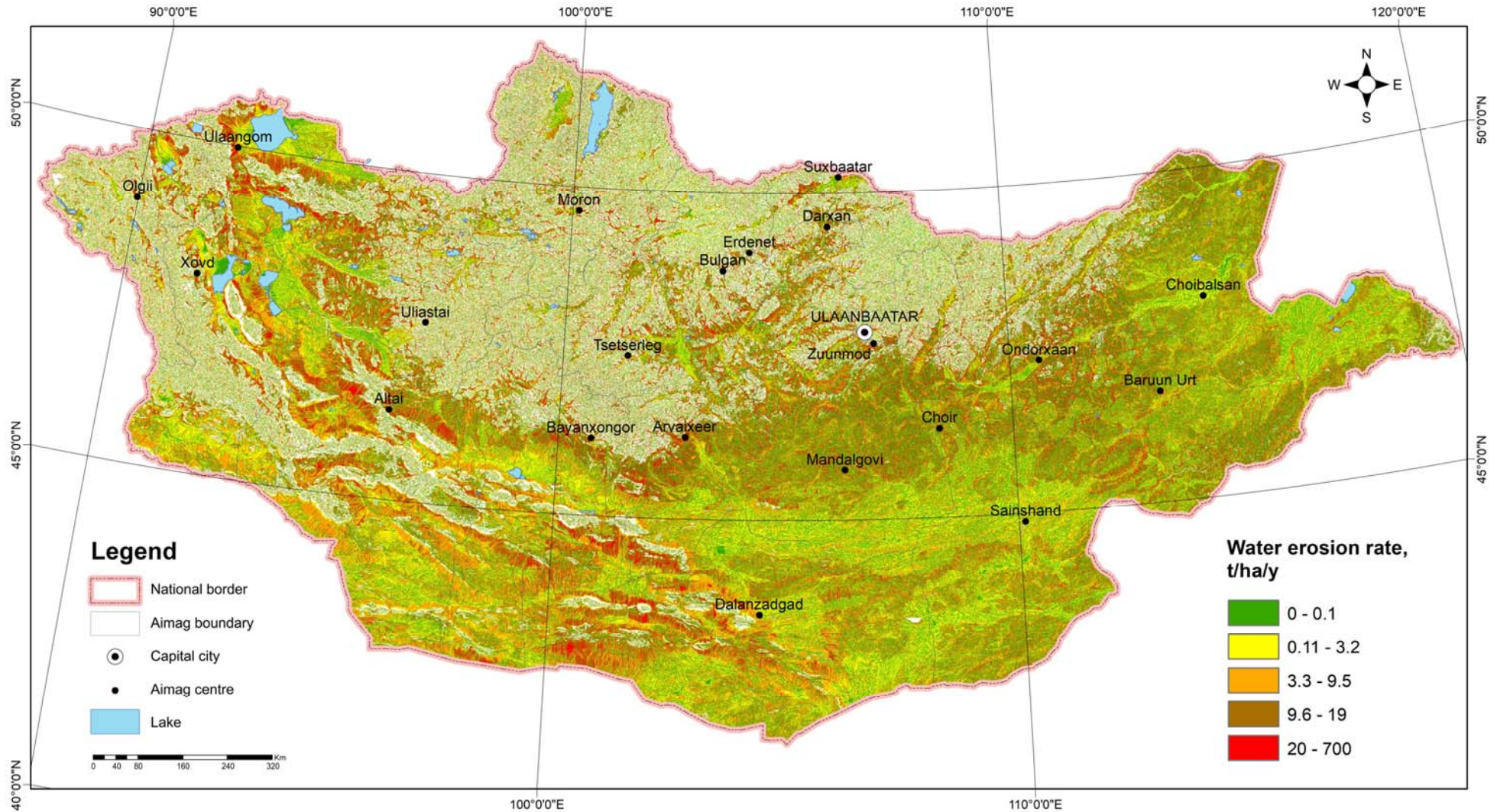
**Map 5: Soil erosion by wind, 2010**



Source: Institute of Geocology and Geography, Academy of Sciences, 2017.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

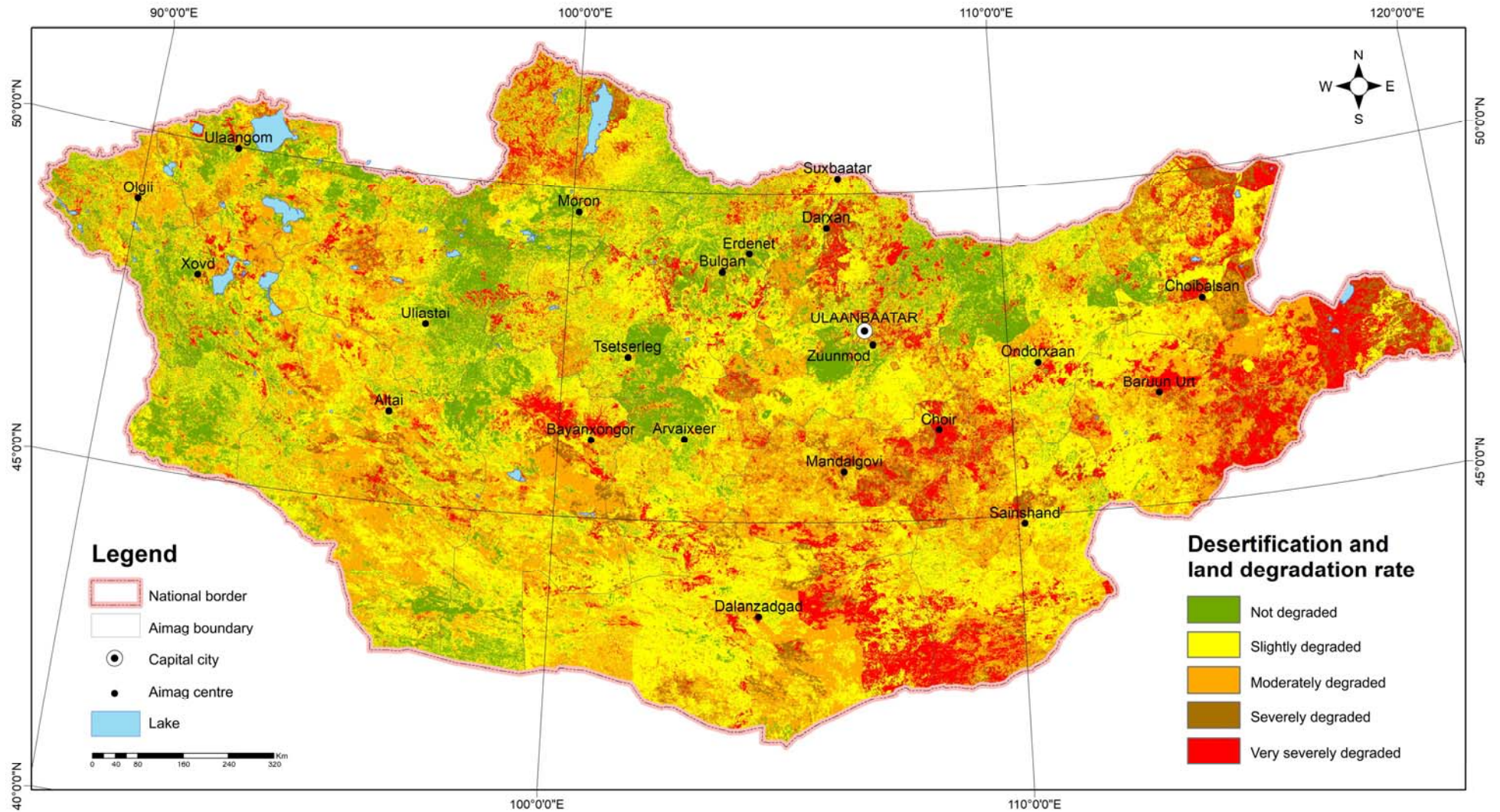
**Map 6: Soil erosion by water, 2010**



Source: Institute of Geocology and Geography, Academy of Sciences, 2017.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

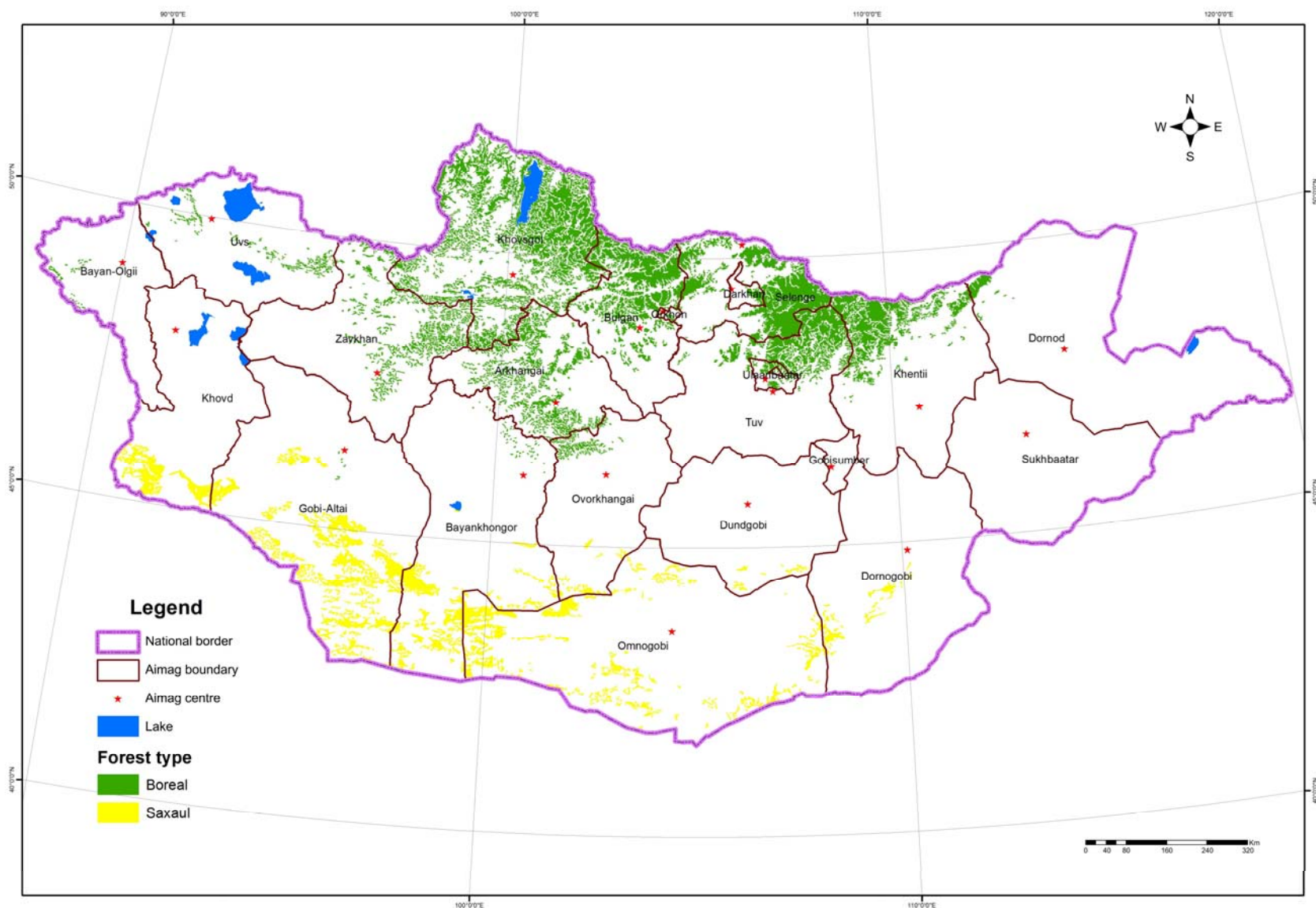
Map 7: Desertification, 2015



Source: Institute of Geocology and Geography, Academy of Sciences, 2017.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

**Map 8: Forest distribution**



Source: Forest Research and Development Centre, 2017.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.



# Mongolia

## Environmental Performance Reviews

The United Nations Economic Commission for Europe Environmental Performance Review Programme assesses progress made by individual countries in reconciling their economic and social development with environmental protection, as well as in meeting international commitments on environment and sustainable development.

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This Environmental Performance Review of Mongolia takes stock of progress made by the country in the management of its environment since 1987. It covers legal and policy frameworks, compliance assurance, greening the economy, environmental monitoring, public participation and education for sustainable development. Furthermore, the review addresses issues of specific importance to the country related to air protection, biodiversity conservation and water, waste and land management. It also examines the efforts of Mongolia to integrate environmental considerations into its policies in the forestry and health sectors and highlights the progress achieved in the management of disaster risk associated with natural and human-made hazards. The review further provides a substantive and policy analysis of the country's participation in international cooperation on the environment, with a specific focus on the three Rio Conventions. Finally, it makes suggestions for strengthening efforts towards a comprehensive and systemic response to sustainable development challenges and the implementation of the 2030 Agenda for Sustainable Development.

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