



General Assembly

Distr.: General
23 July 2021

Original: English

Seventy-sixth session

Item 20 (k) of the provisional agenda*

Sustainable development: combating sand and dust storms

Combating sand and dust storms

Report of the Secretary-General

Summary

The present report, submitted pursuant to General Assembly resolution [75/222](#) on combating sand and dust storms, provides details on developments within the United Nations system since the issuance of the previous report of the Secretary-General on the subject ([A/75/278](#)) and covers the period from mid-2020 to mid-2021.

The report highlights activities and initiatives undertaken by United Nations system entities, Member States and a range of stakeholders, and underscores achievements made during the reporting period in the following four principal areas: cross-cutting activities; monitoring, prediction and early warning; impact mitigation, vulnerability and resilience; and source mitigation.

* [A/76/150](#).



I. Introduction

1. In its resolution [75/222](#) on combating sand and dust storms, the General Assembly requested the Secretary-General to submit to the Assembly at its seventy-sixth session a report on the implementation of the resolution and encouraged the relevant entities of the United Nations, within their respective mandates and resources, and donors to continue to provide capacity-building and technical assistance for combating sand and dust storms and to continue to support the implementation of the national, regional and global action plans of the affected countries. The present report details developments since the issuance of the third report of the Secretary-General on the subject ([A/75/278](#)) and covers the period from mid-2020 to mid-2021.

2. Sand and dust storms occur most frequently in the world's drylands, but major events can transport dust over great distances so that their impacts occur both in the areas where they originate and in communities far from the source areas. The hazards associated with sand and dust storms present a formidable challenge to achieving sustainable development. Short-term costs include crop damage, livestock mortality, infrastructural damage (buildings, power and communications), interruption of transport and communication systems, air and road traffic accidents and the expense of clearing away sand and dust. Longer-term costs include chronic health problems, soil erosion, reduced soil quality, soil pollution through the deposition of pollutants and the disruption of global climate regulation services.

3. These impacts are felt in many socioeconomic sectors, not least in agrifood systems, in places where food is grown and livestock grazed, but also at numerous points in the journey of food from farm to table. As highlighted by the *Global Sustainable Development Report 2019*,¹ transformation towards sustainable food systems, which includes mitigating the sources and impacts of sand and dust storms, can bring benefits across sectors and accelerate progress on multiple Sustainable Development Goals by leveraging interlinkages to maximize synergies and manage trade-offs.

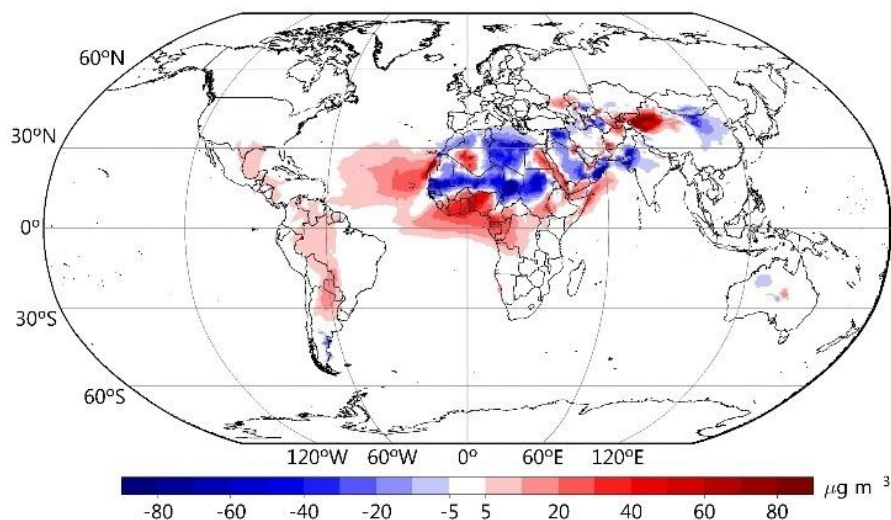
4. The transboundary nature of sand and dust storms, and the hazards associated with them, were illustrated in some notable large-scale events in early 2021. In February, dust from the Sahara arrived in Europe in two major events, causing air quality to deteriorate from the Mediterranean coast across much of central Europe as far as Scandinavia and depositing several million tons of material.² In mid-March, a major sand and dust storm in north-east Asia resulted in the death of eight people and about 200,000 livestock in Mongolia as well as damage to electricity pylons and substations.³ In China, hundreds of flights were cancelled due to poor visibility at Beijing airport, and in the Republic of Korea, a dust health advisory was issued the following day for Seoul and almost all regions of the country. Desert dust is blown every year from the Sahara to Europe and from North-East Asia across the Korean Peninsula and over the northern Pacific Ocean, but these events were particularly severe. They also illustrate the variability of sand and dust storm intensity and frequency given that the global surface concentration of desert mineral dust in 2020, relative to climatologically mean values (see figure), indicates that sand and dust storm activity over much of the Sahara and Gobi deserts was markedly below average in that year.

¹ United Nations, *Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development* (2019).

² Ali Hoshyaripour, "February 2021: A dusty month for Europe", European Geosciences Union Blogs, 3 April 2021.

³ World Meteorological Organization, "Severe sand and dust storm hits Asia", 16 March 2021.

Anomaly of the annual mean surface concentration of dust in 2020 relative to the mean of 1981–2010



Source: World Meteorological Organization, Airborne Dust Bulletin, No. 5, July 2021.

5. In providing information and updates on global efforts to combat sand and dust storms, in alignment with the Sustainable Development Goals, the present report draws on contributions from the Food and Agriculture Organization of the United Nations (FAO), the secretariat of the United Nations Convention to Combat Desertification, the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Asian and Pacific Centre for the Development of Disaster Information Management of ESCAP, the Economic and Social Commission for Western Asia (ESCWA), the World Health Organization (WHO), the International Telecommunication Union (ITU), the World Bank, the United Nations Development Programme (UNDP), United Nations Human Settlements Programme (UN-Habitat), and the United Nations Framework Convention on Climate Change.

II. Developments since the issuance of the third report of the Secretary-General on combating sand and dust storms

A. Cross-cutting developments

6. Cooperation at the subregional, regional and interregional levels is an essential part of efforts to tackle sand and dust storm issues, because they are transboundary in nature; the same is true for unified and coherent action. In that regard, the United Nations Coalition on Combating Sand and Dust Storms, which was officially launched in September 2019, has become operational under FAO leadership and is focused on moving from the planning to the implementation stage. At its online meeting held on 21 October 2020, the Coalition confirmed the membership and the leads and co-leads of its five working groups: adaptation and mitigation (UNDP and FAO); forecasting and early warning (WMO); health and safety (WHO); policy and governance (United Nations Convention to Combat Desertification); and mediation and regional collaboration (ESCAP and ESCWA). On 17 February 2021, the Coalition met online again and identified priority activities for the working groups in line with its strategy and overall action plan. For the Coalition as a whole, the priority is to

foster regional and interregional collaboration between countries affected by sand and dust storms, and a number of themes and activities have been identified:

- Enhance visibility and raise awareness on sand and dust storms to catalyse global and regional actions that will support countries in facing the challenge of sand and dust storms and reduce their impact on health, the environment, agriculture and other economic activities
- Facilitate the sharing of knowledge and information on innovation and good practices to counter sand and dust storms (for example, sustainable land management and water use), to enhance mitigation of, and adaptation to, sand and dust storms, among other things
- Formulate a programme to mitigate the impacts and sources of sand and dust storms and adapt and seek potential sources of funding to implement the programme, building on what members are currently doing
- Enhance forecasting and early warning tools and the provision of long-term model reanalysis data for sand and dust storm risk assessments
- Mobilize resources: (a) integration of sand and dust storm-related activities into the United Nations Sustainable Development Cooperation Framework at the national and regional levels, (b) explore multilateral funds (for example, the Adaptation Fund, the Global Environment Facility and the Green Climate Fund), (c) present the United Nations Coalition on Combating Sand and Dust Storms at regional and global levels to help to mobilize resources, and (d) develop a concept note with sand and dust storm priority activities for a large, long-term programme aimed at supporting specific countries in combating sand and dust storms for the fifteenth session of the Conference of the Parties to the United Nations Convention to Combat Desertification (to be held, tentatively, in mid-2022), in order to enhance global commitments.

7. The Asian and Pacific Centre for the Development of Disaster Information Management has been conducting a sand and dust storms risk assessment in Asia and the Pacific to provide a medium and long-term horizon of the risk and potential socioeconomic losses associated with sand and dust storms. The report on the assessment will be published in 2021. The risk assessment covers vulnerable sectors including human health, transport, energy, agriculture and the environment, with a transboundary approach at a regional scale. The Centre has conducted the assessment in coordination with relevant divisions of ESCAP and with the collaboration of the United Nations Coalition on Combating Sand and Dust Storms, scientists who belong to renowned universities and research centres in the region, as well as national meteorological institutes and WMO. The assessment can offer the evidence base on which a regional plan of action to combat sand and dust storms can be built and impact-based forecasting of this hazard can be developed in the region.

8. Another important link in the science-policy interface was produced by UNEP in the form of a report specifically aimed at policymakers, *Impacts of Sand and Dust Storms on Oceans: A Scientific Environmental Assessment for Policy Makers*. The report, which was launched on 6 November 2020, was supported by the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, the Global Partnership on Nutrient Management and the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection and contains advice to the United Nations system, Member States and other stakeholders related to the numerous ways in which sand and dust storms impact ocean health, biodiversity and global climate. Each year, on average, about 0.5 billion tonnes of minerals and nutrients, and organic and inorganic matter, are transferred to the oceans by sand and dust storms, material that has important implications for marine primary production,

with direct and indirect effects on biogeochemical cycles in the oceans. Desert dust is thought to have an impact on algal blooms – links have been found between dust and coral reef systems – and significant impacts on weather and global climate.

9. Capacity-building, awareness-raising, technical cooperation and the sharing of information and scientific findings continue to be important elements in the work on sand and dust storms carried out by many bodies within the United Nations system and beyond. For example, the WMO Sand and Dust Storm Warning Advisory and Assessment System held a virtual special session on air quality and sand and dust storms during the West Africa Hydromet Forum (March 2021), co-organized with the Economic Community of West African States, and two virtual user workshops (May 2021) on dust services for solar energy and dust products for air quality, co-organized with the project of the European Research Area for Climate Services entitled “Dust storms assessment for the development of user-oriented climate services in Northern Africa, the Middle East and Europe” (DustClim). Also notable in that regard is a webinar series of scientific presentations that was initiated in January 2021 by the International Network to Encourage the Use of Monitoring and Forecasting Dust Products, otherwise known as inDust, a network created under the European Cooperation in Science and Technology programme, funded by the European Union. InDust comprises research institutions, service providers and potential end users of information on airborne dust. It has four working groups, each connected to a key user community: air quality, aviation, human health and solar energy.

B. Monitoring, prediction and early warning

10. In January 2021, the Asian and Pacific Centre for the Development of Disaster Information Management developed the publication *Guideline on Monitoring and Reporting the Impact of Sand and Dust Storms through the Sendai Framework Monitoring*. The aim was to provide Member States with a practical step-by-step guide that would support them in their efforts to monitor and report the impact of sand and dust storms through the Sendai Framework monitor. The approach adopted to Sendai Framework monitor reporting in the *Guideline* is hazard-specific. The *Guideline* is meant to be used as a complementary resource to the publication *Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework* of the United Nations Office for Disaster Risk Reduction (UNDRR). Of the seven global targets of the Sendai Framework, the *Guideline* emphasizes targets and indicators that can be disaggregated by hazard type. It also contains a proposal for custom indicators that can be tailored at the national level to monitor sand and dust storm impacts and gives guidance on how sand and dust storms interact with all the Sendai Framework indicators. The *Guideline* was developed with technical input from the United Nations Convention to Combat Desertification, UNDRR, FAO, ESCAP, WMO and academia.

11. Effective disaster risk management and early warning depend on resilient telecommunications infrastructure and services but also on the implementation of national strategies and plans that ensure effective and timely information-sharing across all levels of government, within affected communities and among public and private organizations. A timely and effective flow of information is important for risk-informed decision-making, for early warning and for the effective coordination and articulation of response efforts by all stakeholders involved in disaster risk management. In 2020, ITU developed its publication *ITU Guidelines for National Emergency Telecommunication Plans*, designed to assist policymakers, national regulatory authorities and national stakeholders in different sectors in developing a clear and flexible national emergency telecommunications plan with a multi-stakeholder approach. Also in 2020, ITU published a report entitled *Emergency Telecommunications*

Table-top Simulation Guide to assist countries in developing national plans by conducting table-top simulations for testing and refining emergency telecommunication plans and policies and verifying whether networks, redundant communications capacity, personnel, and other telecommunication systems are in place. In 2021, those publications were supplemented with training courses on developing national emergency telecommunications plans and table-top simulation. ITU has been supporting countries with frequent sand and dust storms, including Afghanistan, Peru, Somalia and the Sudan, in developing their national emergency telecommunications plans.

12. Sand and dust storms have become increasingly problematic in the water-scarce Arab region. They have expanded in geographical scope, likely because of climate change and changing environmental conditions such as land use and land cover change. This fact was highlighted in recent analytical work by the World Bank on the Middle East and North Africa region. In realizing the need to better understand these extreme events within the context of climate change, ESCWA, through its Arab Centre for Climate Change Policies, has been implementing the inter-agency Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region. Under the initiative, regional climate projections were prepared for the Middle East and North Africa/Arab domain validated by the Coordinated Regional Climate Downscaling Experiment. In May 2021, in collaboration with the Swedish Hydrological and Meteorological Institute, a series of high-resolution regional climate projections was released for the new Mashreq domain that covered Western Asia. Climate parameters and indices, and a baseline analysis will be used to identify and project sand and dust storm hotspots to inform an inter- and intraregional exchange with a view to reducing disaster risks and fostering collaborative action.

13. ESCWA, WMO and the League of Arab States also support the Arab Climate Outlook Forum, in which Arab meteorological services are engaged in the delivery of seasonal weather forecasts and the provision of meteorological services. The fifth and sixth meetings of the Forum were held in June and November 2020, respectively. Seasonal weather forecasting models were run to forecast three-month weather parameters, such as average temperature and precipitation, for the summer and winter seasons. The results were used to analyse the probability of sand and dust storms occurring during the peak season at different hotspot areas in the Arab region and to provide early warnings to end users. Also at the meetings, historical forecasts were validated to assess the performance and accuracy of the seasonal forecasting models and gain a better understanding of the frequency and seasonal behaviour of sand and dust storms.

14. WMO has made several improvements to the observation and modelling systems that are part of its Sand and Dust Storm Warning Advisory and Assessment System, which provides sand and dust storm forecasts for early warning systems in various countries. The improvements include a modification developed by the Republic Hydrometeorological Service of Serbia that makes it possible to predict, for the first time, airborne dust emitted from high-latitude soil sources. The model's domain covers the Arctic circle; dust sources are identified on the basis of the one-kilometre resolution global sand and dust storm source map produced by the United Nations Convention to Combat Desertification.⁴ This development resulted from a growing desire to better understand the role of aerosols, including dust, in the accelerated warming at high latitudes and the realization that dust is an important climate change driver in polar regions because of its contribution to the darkening and melting of snow. In mid-2020, a new item was added to the catalogue of

⁴ Available at <https://maps.unccd.int/sds/>.

multi-model products offered by the Northern Africa-Middle East-Europe regional centre and node of the Sand and Dust Storm Warning Advisory and Assessment System, which is based in Barcelona, Spain: daily mean probability maps of dust surface concentration and dust optical depth exceeding a given threshold. These probabilistic products were developed in response to demand from the air quality community. In addition, an advanced decadal regional dust reanalysis for Northern Africa, the Middle East and Europe, developed under the DustClim project of the European Union, is being incorporated into the available datasets of the Barcelona regional centre. This dust regional reanalysis will be used in the further development of climate-based dust products.

15. The Pan-America node of the Sand and Dust Storm Warning Advisory and Assessment System has initiated the development of a multi-model dust forecasting system designed to mitigate the harmful effects of dust on human health and the economy in North America. Model performance will be evaluated on the basis of satellite, suborbital and ground observations over North America to determine weighting factors and optimize the system. The Asian node of the Sand and Dust Storm Warning Advisory and Assessment System improved an online data-sharing protocol between member countries for near-real-time observational data and operational numerical forecast data, and fostered scientific research around sand and dust storm forecasting. A set of research priorities to further improve forecasting and assessment capabilities is set out in the System's science and implementation plan for the period 2021–2025. WMO recently published *Sand and Dust Storm Warning Advisory and Assessment System: Science Progress Report*. In addition, it published *Desert Dust Outbreak in the Canary Islands (February 2020): Assessment and Impacts*, and the fourth and fifth issues of its Airborne Dust Bulletin (May 2020 and July 2021 respectively).

C. Impact mitigation, vulnerability and resilience

16. The secretariat of the United Nations Convention to Combat Desertification assists in building the capacity of countries to address the impacts of sand and dust storms, as mandated by decision 25/COP.14, adopted at the fourteenth session of the Conference of the Parties to the Convention on 12 September 2019 and entitled "Follow-up on policy frameworks and thematic issues: sand and dust storms". In that regard, a pilot project to develop plans and strategies to address sand and dust storms at the regional level in Central Asia (including Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) is scheduled for completion by September 2021, and a national-level project was launched in Nigeria in April 2021. The secretariat is nearing the completion of a compendium under the title *Sand and Dust Storms Compendium: Information and Guidance on Assessing and Addressing the Risks*, been developed in collaboration with several United Nations system entities and partners. The objective of the compendium is to provide guidance, tools and methodological frameworks to aid in the development and implementation of policies and activities aimed at reducing the impact of sand and dust storms at the national and regional levels. The compendium is based on the Policy Advocacy Framework to Combat Sand and Dust Storms that has been established under the Convention and focuses on its three action areas and cross-cutting themes: monitoring, prediction and early warning; impact mitigation, vulnerability and resilience; and source mitigation. The compendium, which is expected to be published in early 2022, will contain an introduction and 12 other chapters reflecting discussions on areas related to sand and dust storms, such as the nature of these phenomena; disaster management; the risk posed by sand and dust storms; a risk assessment framework; an economic impact assessment framework; a geographical information system (GIS)-based vulnerability mapping framework; sand and dust storm source mapping; forecasting and models;

early warning; impact on human health; sand and dust storm source management; and impact response and mitigation.

17. The secretariat is developing a toolbox for sand and dust storms, which will include decision-making support tools, in collaboration with relevant United Nations system entities (in particular ESCAP, FAO, UNDP, UNDRR, UNEP and WMO), institutions and partners. The aim of the sand and dust storms toolbox is to provide relevant stakeholders with easy access to tools, methodologies, approaches, case studies and other resources to support the development and implementation of sand and dust storm policies and plans at various levels. UNDP is providing a financial contribution for the completion of that work, ahead of the fifteenth session of the Conference of the Parties to the Convention, to be held in 2022. This will facilitate the toolbox's piloting in 2022 at the national level through the UNDP network of country offices in affected countries.

18. FAO has established a cross-divisional task team to coordinate its work on sand and dust storms. As part of that work, an interregional project on catalysing investments and actions was initiated in September 2020 to enhance resilience against sand and dust storms in agriculture. The project was developed in response to requests from six countries (Algeria, China, Iran (Islamic Republic of), Iraq, Kuwait and Mongolia) that are major contributors to dust emissions, victims of such emissions, or both. Two research institutes, the International Centre for Agricultural Research in the Dry Areas and the International Center for Biosaline Agriculture, support the project. The aim is to close some of the knowledge gaps in the quantification of sand and dust storm impacts on agriculture and to identify risk management measures at the policy and community levels to mitigate hazards associated with sand and dust storms at the source and in agricultural activities that are affected. The work includes the assessment of impacts on crops and livestock using an econometric model, and the compilation of a compendium of high-impact, context-specific practices and interventions, such as sustainable land and water management techniques. In March 2021, a two-day online knowledge exchange and awareness-raising workshop was convened under the project to share initial research findings and learn from other stakeholders about activities and needs in relation to sand and dust storms. Among the presentation topics was a risk assessment model for sand and dust storm impacts on livestock in Mongolia, and work done on the considerable negative impacts of sand and dust storms on date palms. There were fruitful discussions on the potential use of sand and dust storm forecasts for various agricultural sectors, the form of warning required and the need to identify appropriate parameters and thresholds for predictions. The project is taking initial steps towards developing sand and dust storm risk reduction strategies by supporting Iran (Islamic Republic of), Iraq and Mongolia in conducting sand and dust storm-specific vulnerability, risk and capacity assessments and compiling contingency plans, including standard operating procedures for selected districts within those countries. That groundwork will lay a robust foundation for a large-scale follow-up programme that will be designed to scale up resilience-building against sand and dust storms.

19. Land degradation is an important driver of sand and dust storms and has huge economic and health costs. Hence, projects designed to avoid, reduce and reverse land degradation through large-scale sustainable integrated landscape management activities, particularly in drylands where wind erosion occurs most frequently, are critical to combat sand and dust storms. In that regard, the World Bank has designed and implemented several projects to manage key landscapes in the Middle East and North Africa region sustainably. In Tunisia, a pilot project aimed at improving sustainable natural resource management and promoting the diversification of livelihoods in targeted traditional oases is being scaled up through a new project on

sustainable oasis landscape management that is currently being designed.⁵ Under the pilot project, broad natural resource management and sustainable economic diversification were supported by establishing an integrated and bottom-up development process through a range of institutional measures and investments. Specific outcomes included: reducing the severity of land degradation; increasing the efficiency of water management for agriculture; improving the livelihoods of local people, in particular women and young people, by diversifying economic activities; and establishing, with the Government, an effective strategy for sustainable development of the country's oases. The investments on the ground are meant to reduce existing and avoid further land degradation at the landscape scale, and thus to help to mitigate sand and dust emissions and increase the resilience of both ecosystems and populations at risk.

20. Another World Bank project, designed to tackle health issues related to air pollution, is that entitled "Greater Cairo air pollution management and climate change project", which was approved in September 2020. The early warning and rapid response mechanism developed under the first component of the six-year project serves as a critical urban resilience mechanism to protect public health from potential changes in extreme anthropogenic air pollution events, including dust storms and blowing dust events. By monitoring and detecting hazardous pollution and related climate events, and warning the population to take mitigating action, this component helps to alleviate a critical vulnerability of the population of greater Cairo and increase its resilience against the adverse impacts of climate change and related sand and dust storm events. The link between sand and dust storms and climate change has been recognized by the Nairobi work programme on impacts, vulnerability and adaptation to climate change, which is the knowledge-to-action hub for climate resilience and adaptation under the United Nations Framework Convention on Climate Change and is mandated to include sand and dust storms as a topic in its future thematic areas.

21. WHO is involved in several activities directly related to sand and dust storms. In the second half of 2021, after an international call for experts and scientists, WHO is expected to have a technical expert group dedicated to desert dust. The group will carry out systematic reviews of exposure to desert dust, consider our understanding of the mechanisms underlying the health effects related to desert sand and dust and the methods used to characterize exposure and to assess health risks, and identify research gaps. The health effects of desert dust have been under investigation for several years and some evidence on the short-term effects is already available. However, there are not enough studies on the long-term effects, which makes it more difficult to mount dedicated public-health responses. The implication is that data collection and research activities need to be designed better, as the published studies differ in settings, assessment methods for exposure and design.⁶ A systematic review of the adverse health effects of desert dust commissioned by WHO, in which evidence from 93 studies was summarized, has shown the short-term relationship between desert dust and health.⁷ In particular, desert dust has an overall effect on cardiovascular mortality and respiratory morbidity, but the evidence is still inconsistent if sources of particulate matter in various geographical areas are taken into account. In 2020, WHO published the report of an expert consultation it had held on personal interventions

⁵ The project titles are, respectively, "TN-Oases ecosystems and livelihoods project", and "TN-Sustainable oasis landscape management project".

⁶ Xavier Querol and others, "Monitoring the impact of desert dust outbreaks for air quality for health studies", *Environment International*, vol. 130, No. 104867 (September 2019).

⁷ Aurelio Tobias and others, "Health effects of desert dust and sand storms: a systematic review and meta-analysis", *Environmental Epidemiology*, vol. 3, p. 396 (October 2019).

and risk communication on air pollution.⁸ The conclusion was that while reducing exposure was often recommended during major pollution episodes (such as dust storms) to reduce the risk of acute harm, the greatest health benefit was likely to be achieved with daily reductions in the risk of chronic harm.

22. WHO systematizes the available evidence with the help of public discussion and publications. Reports are a means to systematize expert advice on monitoring exposure for health studies and suggestions for surveillance mechanisms. The new WHO air quality guidelines, whose release is expected in 2021, will include a chapter specifically dedicated to good practice statements on dust and sand storms. However, based on the available studies, formulating an air quality guideline for levels of desert dust is not possible.

23. WHO collaborates with other United Nations system agencies, including the secretariat of the United Nations Convention to Combat Desertification, FAO and WMO. For example, a WHO/WMO report on health and sand and dust storms written with various experts for each chapter is expected to be released in early 2022. The report is part of a strategy to strengthen public health responses to sand and dust storms in the countries that are more exposed, taking advantage of regular interaction with various regions and countries to better understand warning and response systems and the role of the health sector.

24. With reference to paragraph 17 of General Assembly resolution [75/222](#), in which the Assembly invited the United Nations Coalition on Combating Sand and Dust Storms to prepare recommendations on mitigating the common effects of both the coronavirus disease (COVID-19) and sand and dust storms, the WHO response is as follows: COVID-19 lockdown measures taken in many countries have had relevant effects on air quality. WHO recently conducted a study in Jordan on the impact of the lockdowns on PM_{2.5} levels and on the number of lives saved.⁹ The lockdowns of March and April 2020 coincided with dust storms, thus PM_{2.5} levels did not decline as expected. WHO is planning to conduct a similar study in the United Arab Emirates. It is fundamental to continue efforts to abate air pollution. When taking mitigating measures, it should be taken into account that a reduction in cardiovascular and respiratory disease, as comorbidities linked to COVID-19-related deaths, can produce significant health benefits. However, to ensure the effectiveness of mitigation measures, data on the contributions of the various sources of emissions need to be considered.

D. Source mitigation

25. United Nations system entities have continued to provide capacity-building and technical assistance for combating sand and dust storms at source. Notable in that regard is a public awareness and tree-planting campaign under the slogan “Kuwait plants”, which has been organized by the UN-Habitat office in Kuwait with the aim of greening open public spaces and mitigating the effects of sand and dust storms on cities in the country, thus promoting a general improvement in public health. The campaign, initiated in 2019, included two major projects, one in 2020 and one in 2021, as part of which saplings were planted in the Abdaliyah and Subayhiyah nature reserves, which are owned by the Kuwait Oil Company. The success of these events was reflected in the fact that many of the volunteers later reported planting new saplings in their residential areas. The United Nations Decade on Ecosystem

⁸ World Health Organization, *Personal Interventions and Risk Communication on Air Pollution* (Geneva, 2020).

⁹ PM_{2.5} means the mass per cubic metre of air of particles with a diameter less than 2.5 micrometres.

Restoration 2021–2030 is likely to give an additional boost to this and other projects by helping to mitigate source areas of sand and dust storms.

III. Conclusions

26. The recognition of sand and dust storms as an issue of international concern, the costs of which are measured in economic, social and environmental terms, continues to grow. Sand and dust storms directly affect 11 of the 17 Sustainable Development Goals and threaten the means of implementation and revitalization of the Global Partnership for Sustainable Development because of the socioeconomic losses they can trigger, both extensive and intensive. A collaborative United Nations system response to these challenges is being organized by the United Nations Coalition on Combating Sand and Dust Storms, which has become operational and is moving from the planning to the implementation stage. The transboundary nature of the sand and dust storm hazard has prompted the Coalition to prioritize the encouragement of regional and interregional collaboration between countries affected by sand and dust storms. The Coalition's five working groups have identified priority activities in line with the Coalition's strategy and overall action plan, and mobilization of the resources needed for these activities is a critical next step.

27. The cumulative effects of sand and dust storms on human society are significant, complex, and widespread. However, many gaps remain in data, information, knowledge and understanding regarding the numerous ways in which society interacts with the dust cycle, uncertainties that hinder the work of Governments and other stakeholders working to address this important global disaster risk management issue. Further work to fill these gaps is required at the international, national and local levels as part of efforts to achieve the 2030 Agenda for Sustainable Development.