



Economic and Social Council

Distr.: General
28 July 2010

Original: English

Economic and Social Commission for Asia and the Pacific

Ministerial Conference on Environment and Development in Asia and the Pacific

Sixth session

Astana, 27 September-2 October 2010

Item 2 of the provisional agenda

Sustainable development in Asia and the Pacific: trends, challenges, opportunities and policy perspectives

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Note by the secretariat

Summary

A review of sustainable development trends, challenges, opportunities and policy perspectives emerging in the five-year period since the 2005 Ministerial Conference on Environment and Development in Asia and the Pacific shows that the challenges of (a) maintaining and achieving economic growth that contributes to poverty reduction; (b) ensuring an adequate supply of natural resources; and (c) avoiding ecological damage, are growing and converging. This convergence has increased risk and uncertainty, and underlined the urgency of action. At the same time, investments in natural capital, green technologies, clean energy, sustainable infrastructure and green jobs represent opportunities for “greener” economic growth and employment creation.

Fundamental changes to economic structures are needed. Incremental actions and initiatives will not be sufficient. While significant improvements in the resource efficiency of production and consumption patterns are needed, labour productivity must be maintained through human capital investments. The invisible structure of the economy – market prices, regulations, lifestyles and technology – must reflect ecological prices. Physical infrastructure – transportation, energy and water systems, buildings – must become more eco-efficient. Governments must take the lead, enabling the private sector to seize emerging opportunities, and engaging consumers in changing lifestyles without compromising quality of life.

The Conference may wish to discuss the issues and challenges highlighted and provide guidance on follow-up action.

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Introduction

1. The purpose of the present document is to review sustainable development trends, challenges, opportunities and policy perspectives that have been revealed during the five-year period since the 2005 Ministerial Conference on Environment and Development in Asia and the Pacific.¹

2. The review shows that economic, resource and environmental challenges have converged, with dramatic impacts on people and on prospects for achieving the Millennium Development Goals. Larger numbers of people are now more vulnerable to environmental change than before, and other risks have compounded their vulnerability.

3. The convergence of economic, resource and environmental challenges is a result of the scale of economic growth and growth patterns that have exerted environmental pressures exceeding global environmental carrying capacities. The limited natural resource base is increasingly constrained. Policymaking perspectives have therefore changed. Economic growth strategies that assume unlimited availability of resources are no longer economically, environmentally or socially sustainable.

4. At the same time, new policy opportunities are beginning to change the economic, market and policy landscape, and now present significant opportunities for the region's policymakers to rethink sustainable

¹ Based on the forthcoming ESCAP/ADB/UNEP publication *Green Growth, Resources and Resilience*.

development strategies. The scale of the challenges faced implies that green growth approaches are now increasingly important for achieving the goal of sustainable development, building competitiveness and resilience, and for mitigating risk. Fundamental and systemic (rather than incremental) changes that recognize this new economic reality are needed. The eco-efficiency of economic growth must be increased and investments in human and natural capital enhanced.

5. At the core of green growth strategies is greater attention to investment and decision-making incentives, pricing and financing mechanisms to promote eco-efficiency and sustainable natural resource management. A qualitative and quantitative shift from investments in inefficient resource use to investments in human and natural capital and sustainable management of key resources is needed. It will be critical to engage, facilitate and empower stakeholders in effecting this transition, and also in adapting to environmental change.

6. What are the trends, emerging challenges and opportunities for achieving sustainable development? What do they mean for policymakers? How can the international community better support member States?

I. Sustainable development trends, challenges and opportunities

A. Converging economic, social and environmental challenges

7. In 2005, the secretariat reported to the fifth Ministerial Conference on Environment and Development in Asia and the Pacific that regional economic growth rates were among the highest in the world. Most countries in the region had registered economic growth rates high enough to support the achievement of Millennium Development Goal 1, on halving the number of people in poverty (see E/ESCAP/SO/MCED(05)/1).

8. The numbers of people living in poverty as well as undernourishment rates, another key Millennium Development Goal indicator, had been dramatically reduced. Although the number of people without access to basic services was still high and economic growth that contributed to equitable poverty reduction had eluded most economies, there were positive socio-economic trends to report.

9. The 2005 report and outcomes of the Ministerial Conference emphasized that socio-economic progress had been achieved at great environmental cost due to unsustainable economic growth patterns. Although there had been measurable improvements in urban air quality in some cities, slowed rates of forest loss, increased forest planting rates in some countries and considerable success in reducing the use of ozone-depleting substances, environmental degradation, natural disasters and the regional contribution to climate change processes and biodiversity loss continued to threaten human health and livelihoods in the long term, and had increased the overall vulnerability of member countries.²

² A ministerial forum to address the health effects of these environmental changes was established in South-East and East Asia in August 2007 with the support of WHO and UNEP.

10. Five years later, the basic “state of the environment” indicators do not indicate significant improvement in overall trends. At the same time, there have been important changes in economic and social conditions and trends.

11. Interlinkages between energy, food and financial markets became more apparent in 2008. The recession, peaking food, energy and commodity price increases and climate change impacts converged in late 2008, resulting in rising unemployment, hunger and social conflict. ESCAP has estimated that the economic recession and associated developments could trap an additional 21 million people in poverty during 2009 and 2010.³ Higher food prices in Asia and the Pacific had already increased the number of undernourished from 542 million in 2003-2005 to 583 million in 2007.⁴ Already hit by unemployment and income losses caused by a slowing economy as well as rising energy prices, the most vulnerable reacted. Several countries in the region experienced food riots in 2008 and 2009.

12. Economies in the region proved relatively resilient in comparison with the rest of the globe. By July 2010, China and India and other countries had resumed their rapid growth trajectories. For the first time, the wealth possessed by the region’s affluent surpassed that of Europe.

B. Forces for convergence - resource constraints and climate change

13. The return to rapid growth does not mean that the 2008 crisis will soon become a distant memory. The region’s economies were relatively resilient to the crisis, but high food prices, energy and commodity price volatility, persistent inequalities, and climate and environmental change still overshadow the regional outlook.

14. The convergence of the economic, resource and environmental challenges that impacted people across the region had been decades in the making. Two major forces brought these challenges together: (a) resource constraints arising from growing demand for all kinds of resources; and (b) climate change.⁵

15. Gaps between the demand for and supply of key commodities, together with speculative investments and other factors, dramatically increased prices until 2008, with critical impacts on both the global economy and people. Non-fuel commodity prices increased by more than

³ Based on the \$1.25-a-day poverty line, see ESCAP, ADB, UNDP, *Achieving the Millennium Development Goals in an Era of Global Uncertainty* (United Nations publication, Sales No. E.10.II.F.10).

⁴ FAO, “Briefing paper: Hunger on the rise – soaring food prices add 75 million people to global hunger rolls”, 17 September 2008, cited in ESCAP, *Economic and Social Survey of Asia and the Pacific 2009: Addressing Triple Threats to Development* (United Nations publication, Sales No. E.09.II.F.11), p. 55.

⁵ In 2009, ESCAP undertook two major reviews of food security challenges and the emerging threats to development – global recession, food and fuel price volatility, and climate change. See *Economic and Social Survey of Asia and the Pacific 2009: Addressing Triple Threats to Development* (United Nations publication, Sales No. E.09.II.F.11) and ESCAP (2009) *Towards Sustainable Agriculture and Food Security in the Asia-Pacific Region* (United Nations publication, Sales No. E.09.II.F.12).

159 per cent between 2002 and 2008. Metal and mineral prices increased by 285 per cent and agricultural raw material prices by 133 per cent.⁶

16. Energy prices proved a critical pressure point, with oil prices hitting an all-time high of \$145 per barrel in July 2008, and the prices of food, metals, minerals and other commodities mirroring energy price trends. As the prices of industrial and agricultural inputs, construction materials and food increased, inflation and other factors stepped in, the global economy slowed and jobs and livelihoods were lost.

17. While incomes decreased, daily necessities became more expensive, food in particular. Drought and the resultant shortfalls in critical agricultural inputs added to the upward pressures on food prices by reducing crop yields. Shortfalls in energy supplies and climate change concerns had, for several years, encouraged agricultural production for fuel rather than for food, further limiting the availability of land for food production. As much as 70 per cent of the increase in global maize production between 2004 and 2007 was for the production of ethanol to produce bio-fuels.⁷

C. Uncertainty and risk

18. The factors that led to the convergence of crises are gathering strength as the demand for resources continues to grow and as environmental risks increase. The 2005 ESCAP report stressed that Asia and the Pacific had the lowest per capita supplies of resources of all regions. In a region of resource-intensive economies that are becoming central to global production, as well as significant poverty and undernourishment, resource risks are likely to be higher than in the rest of the world.

19. Indicators such as the ecological footprint have shown for some time that the world's economies and societies are already using 40 per cent more resources than the earth can sustainably provide, and the demand for resources continues to grow. In 2004, revisiting the work done for *Limits to Growth* after 30 years, the authors concluded that "if a profound correction is not made soon, a crash of some sort is certain. And it will occur in the lifetime of many who are alive today."⁸

20. Concerns about resource scarcity are not only evident in the scientific world. These concerns have already driven important policy and strategic developments to support more resource-efficient economic growth in China. In Japan, both resource scarcities and mounting waste-management burdens have engendered support for global action on reducing, reusing and recycling resources, known as the 3R Initiative. Further afield, the European Commission is taking action to reduce resource risks in relation to minerals.

⁶ Euractiv, "Raw materials: Heading for a global resource crunch?", 18 January 2010 (updated 29 January 2010), accessed on 11 March 2010 from <http://www.euractiv.com/en/sustainability/raw-materials-heading-global-resource-crunch>.

⁷ ESCAP, *Economic and Social Survey of Asia and the Pacific 2009: Addressing Triple Threats to Development* (United Nations publication, Sales No. E.09.IIF.11).

⁸ Donella Meadows, Jorgen Randers and Dennis Meadows, *Limits to Growth: The 30 Year Update* (2004).

21. Perceptions of future resource scarcity have played a role in integrating food, fuel and financial markets. Investments in these markets have increased energy and commodity price volatility⁹ and, as a result, uncertainty in many economic sectors.

22. Peak Oil, a term used to describe a point in time when the maximum rate of oil extraction has been reached, was recently projected to occur in 2020, after which production will decline. In the case of a few key minerals, above-ground supplies will be larger than underground reserves by 2050, mirroring the concern over Peak Oil.¹⁰

23. Recent food price increases were, in part, caused by shortfalls in food production and evident and growing scarcities and/or rising prices of important agricultural inputs — water, energy, land, nutrients.¹¹ Those factors, which have exacerbated both long- and short-term food security challenges, are expected to continue.

24. Resource use is also driving environmental change. Research shows that the extent to which natural resources are being used and the resultant impacts on natural systems means that “tipping points” are being approached in natural systems and rapid environmental change can be expected. Environmental change associated with climate change is just one manifestation of this.¹²

25. Extreme climatic events already impact localized food security. The frequency of such events is increasing and can be expected to become more serious in the future, and to further impact on global food and energy supplies. A review of the economics of climate change in South-East Asia shows that, by 2100, rice yield potential is likely to decline by 50 per cent, on average, from the 1990 level. This review also illustrates that the economic risks faced by countries which are more susceptible to climate

⁹ ESCAP, *Economic and Social Survey of Asia and the Pacific 2009: Addressing Triple Threats to Development* (United Nations publication, Sales No. E.09.IIF.11).

¹⁰ For metals such as gold, silver and copper, the on-surface stock (processed and manufactured metals) is now estimated to be equivalent to, or larger than the underground stock. Underground reserves of other metals such as iron, cobalt, platinum and palladium, are projected to be close to exhaustion by 2050. K. Halada, “Resource availability and the promotion of the 3Rs”, presentation at the Asia Regional Seminar for Sustainable Resource Management, Tokyo, 10-11 March 2009.

¹¹ J. Cribb, *The Coming Famine: The Global Food Crisis and What We Can Do To Avoid It*. University of California Press and CSIRO Publishing, Canberra, Australia, 2010 (in press – excerpts taken from *Science Alert*, 18 April 2010).

¹² The GEF Scientific and Technical Advisory Panel notes that “severe hypoxia and ocean dead zones are manifestations of the global environment reaching critical thresholds, beyond which recovery may be impossible, or very costly” (report of the Scientific and Technical Advisory Panel to the Fourth GEF Assembly, GEF/A.4/3, 20 April 2010). One study examines nine environmental processes — climate change, rates of biodiversity loss, interference with the nitrogen and phosphorus cycles, stratospheric ozone depletion, ocean acidification, global freshwater use, change in land use, chemical pollution and atmospheric aerosol loading — and finds that critical thresholds have already been passed in the case of climate change, rate of biodiversity loss and interference with the nitrogen cycle (see J. Rockström et al, “A safe operating space for humanity”, *Nature* 461, 472-475 (24 September 2009)).

change are higher than the world average. For the four countries covered, the costs could be equivalent to a loss of 6.7 per cent of their combined gross domestic product (GDP) by 2100, more than twice the world average.¹³

D. Resource use trends

26. Gaps between the demand for and supply of resources such as energy, water, biomass and minerals have had increasingly converging impacts on economies and people. Improvements in resource efficiency will help narrow the gap between demand and supply, thereby mitigating risk. Regional resource efficiency and use trends therefore serve as a key indicator of sustainability and of the potential for achieving sustainable development.

1. Materials use and efficiency

27. The Asia-Pacific region is at the centre of the global challenge on the use of resources. By the start of the twenty-first century, the Asia-Pacific region had become the world's largest resource user, annually using 35 billion tonnes of resources—metal ores, industrial minerals, fossil fuels construction minerals and biomass—by 2005. The average annual growth rate of total regional material use between 1970 and 2000 was steady at 3.2 per cent until 1990, slowed during 1990 to 2000, and then increased sharply—to 6.0 per cent—from 2000 to 2005. This dramatic acceleration of regional material consumption after 2000 had a significant impact on global consumption rates, which more than doubled—to 3.7 per cent—after 2000.¹⁴

28. The majority of countries in the region are becoming more material, energy and water efficient as they grow. With few exceptions, each unit of value added (indicated by GDP) created in the economy from 1995 to 2007 generally required less energy, water and material input than in previous years. For the majority of countries, improvements in energy intensity relative to economic growth accelerated between 1995 and 2005.

29. However, improvements in overall resource efficiency (use of materials per unit of GDP) relative to economic growth slowed or declined in almost half of low-income countries and almost one quarter of middle-income countries. The slowdown, coupled with rapid economic growth, contributed to the overall acceleration in resource use described above.

¹³ The review covered Indonesia, the Philippines, Thailand and Viet Nam. See ADB, *The Economics of Climate Change in Southeast Asia: A Regional Review* (Manila, 2009).

¹⁴ "Use" refers to the use for intermediate and final consumption until released to the environment, taking into account trade and domestic extraction of materials. Data produced by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia in collaboration with UNEP for the forthcoming UNEP report *Resource Efficiency: Economics and Outlook for Asia and the Pacific* and the forthcoming ESCAP/ADB/UNEP report entitled *Green Growth, Resources and Resilience*.

30. Many Asian developing economies are already approaching their limits in terms of domestically available resources and environmental carrying capacity, and have become net importers of raw materials, especially fossil fuels and metals.¹⁵

2. Drivers of growth in resource use

31. Reflecting significant unmet needs and legitimate aspirations for improved quality of life, the main drivers of growth in resource use have been increasing per capita incomes and the underlying industrial transformation. Increased incomes and changing lifestyles have been found to be responsible for increases in resource use to a greater extent than population growth. During recent decades, technology has not tempered environmental pressure and impacts to the extent needed. While technological innovation was able to offset some of the growth in material use from 1970 to 1990, this was much less the case during the 1990s and was certainly not so by 2000.¹⁶ There are substantial differences between subregions and countries, depending on a country's development status, its major economic activities and its resource endowment.

32. Rising use of materials is linked to the regional urbanization phenomenon. In 2005, just under half of all material consumed was construction minerals, materials such as sand, gravel, concrete and steel. Construction and housing, mobility, food production and the provision of energy are changing rapidly to modern systems, and the need for infrastructure remains great.

33. Approaches to infrastructure development not only influence the amount of materials used in construction, but also the amount of resources (water and energy) used on an ongoing basis. Infrastructure therefore "locks-in" resource use patterns for several decades over the lifetime of the infrastructure. Approaches to infrastructure development also determine the extent to which resource use contributes to human well-being.

3. Resource use and climate change

34. Resource use patterns also have significant implications for climate change. As in other parts of the world, the Asia-Pacific region's economic growth is closely correlated with an increase in greenhouse gas (GHG) emissions. Regional CO₂ emissions increased by 55 per cent between 1990 and 2005 while regional GDP increased by 59 per cent.

35. As a whole, the carbon intensity of the region's economy is significantly higher than that of the global economy (652 versus 487 tCO₂e/million dollars of GDP respectively). The high carbon intensity of the regional economy shows the significant challenges associated with maintaining growth while reducing greenhouse gas emissions. At the same

¹⁵ Based on IPAT analysis and data produced by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia in collaboration with UNEP (see note 14).

¹⁶ Materials covered: metal ores, industrial minerals, fossil fuels, construction minerals and biomass. Data produced by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia in collaboration with UNEP (see note 14).

time, commitments to reducing climatic impacts of economic growth have been made by countries in the region, including China, India, Indonesia and the Republic of Korea.¹⁷

36. Although there has been significant progress in setting renewable energy targets and in renewable energy use, the carbon intensity of electricity production has remained largely unchanged. Energy efficiency gains in production activity have been outstripped by increasing levels of demand for energy-intensive products.

37. Carbon emissions from land use change account for significant proportions of regional emissions—about 13 per cent in total—but are most important in South-East Asia, where land use change was responsible for two thirds of that subregion’s total carbon dioxide emissions in 2005, as compared with less than 3 per cent in all other subregions.¹⁸

E. Translating resource use into benefits for people

38. The Asia-Pacific region has significant unmet needs in relation to poverty and infrastructure development, and legitimate aspirations for an improved quality of life. However, the region is also challenged to ensure that the growth in resource use translates into tangible benefits for people. The sustainability of resource use should therefore be examined in terms of (a) the long-term sustainability of the supply and “withdrawals” of resources, and (b) the extent to which resource use results in positive and equitable socio-economic outcomes.

1. Energy

39. Energy demand in the region is projected to increase by about 34 per cent between 2007 and 2020.¹⁹ This projected demand is partly attributable to the current unmet basic energy need, which is a major barrier to socio-economic progress. Despite concern about energy use, regional energy consumption per capita is much lower than the global figure, but unevenly distributed. As of 2008, approximately 900 million have no access to electricity, and 1.7 billion rely on traditional biomass fuels in the Asia-Pacific region, mostly in South Asia.²⁰ Although the electrification rate of developing countries in recent decades has generally improved, there are countries, such as Bangladesh, Bhutan and Nepal, in which almost two thirds of the population does not benefit from access to modern forms of energy.

¹⁷ China has set a target of a 40 to 45 per cent reduction in carbon intensity compared with 2005. For India, a target reduction of 20 to 25 per cent compared with 2005 levels has been established. Indonesia has targeted a 26 per cent decrease from projected business-as-usual intensity levels by 2020. The Republic of Korea has targeted a reduction of GHG emissions of 20 per cent from business-as-usual emissions by 2020, translating into a 4 per cent reduction from 2005 levels by that time.

¹⁸ Based on data produced by the Climate Analysis Indicators Tool (CAIT) 7.0, World Resources Institute.

¹⁹ ESCAP estimate based on International Energy Agency data.

²⁰ Ibid.

40. At the lowest levels of energy use per capita, a small increase results in important increases in socio-economic progress as measured by the human development index (HDI), when changes in energy use and HDI values are tracked over time. In upper-middle-income and high-income countries, significant increases in energy use per capita support only marginal socio-economic progress. Energy savings from improvements in energy efficiency, if effectively transformed into investments in addressing unmet needs, can therefore boost human development where it is most needed.

2. Land and water

41. Of all the regions of the world, the Asia-Pacific region has the lowest per capita availability of land, which is now expected to fulfil many kinds of functions – urbanization, recreation, production of food and agro-industrial crops and also to continue providing increasingly critical ecosystem services. In many cases, multiple services can be provided by one type of land use (as in the case of forests), but there can also be tradeoffs between one land use and another.

42. In response to the food price spikes in 2008, several countries in the region restricted exports of key commodities, which further increased food prices. Countries in the region also invested in boosting capacity for domestic food production. However, one of the most controversial responses was overseas investment in agricultural production by relatively resource-poor economies through land purchases or leasing.

43. Despite the immense pressure on land resources in the region, the use of agricultural land is not having the expected impact of reducing hunger in many countries. Asian production of non-food crops is growing faster than that of food crops and becoming concentrated in several countries where there are significant and growing food security challenges. The numbers of undernourished increased in at least 11 countries of the region, and in 8 of them agricultural land expanded at the same time. Research-level crop yields are not being attained in most countries, indicating the need for enhanced farmer training and extension services.

44. Despite increased application of the principles of integrated water resources management, the competition for water and the high intensity of water resources use have led to conflicts. Particularly over the past two decades, the number of reported water-related incidents has risen, particularly within large countries, such as China and India. Direct conflicts are most likely to emerge at the local level, especially over ill-planned water infrastructure, ambiguous withdrawal rights or deterioration of water quality.

45. The accelerating impact of climate change on water supplies will be increasingly linked to expanding food challenges, especially in countries that already have vulnerable populations, and inefficient patterns of resource use. Although water is used in high proportions for agriculture in many countries of the region, the use of the water does not always lead to the expected socio-economic outcomes. In India, Pakistan, Sri Lanka and Tajikistan, more than 90 per cent of water is used for agriculture, but more than one in five persons in these countries was undernourished in 2005. These are all water-stressed countries.

46. Total water use approaches or surpasses “severe stress” thresholds in several countries of the region. Where water use per capita is high, as in Pakistan and Tajikistan, there is room for efficiency improvements that can improve outcomes. On the other hand, where water is already used sparingly, as in India and Sri Lanka, there is less room for improvement.

47. The region is an early achiever when it comes to halving the proportion of people without access to safe drinking water, but not sanitation, and extreme inequalities cast clouds over the sustainability of achievements made to date. Inequalities in access to water between rich and poor households are evident all over Asia, but for sanitation the gap is even more striking. As of 2008, the number of people without access to water was 480 million, but this pales by comparison with the number of people who lack access to sanitation, a staggering 1.9 billion.²¹

48. Water, as perhaps the most vulnerable of regional resources, is one of the most critical to examine in terms of supply, patterns of use, and deliverability vis-à-vis socio-economic needs. Sustainability of resource use should be examined in terms of (a) the socio-economic and environmental outcomes of water use²² and (b) the capacity of communities or countries to deliver expected outcomes in an equitable and sustained way.²³

49. The ability to translate even limited water supplies into positive socio-economic outcomes will be increasingly critical. From this perspective, the countries with the most urgent sustainability challenges are Cambodia, India, Indonesia, the Lao People’s Democratic Republic, Myanmar, Pakistan, Papua New Guinea, the Philippines, Thailand and Uzbekistan. Integrated water resources management and intelligent, equitable and eco-efficient infrastructure investments and management of water demand will be increasingly necessary.

3. Ecosystem services

50. Environmental pressures have implications for the supply, health and diversity of ecosystems, and so for the supply of ecosystem services on which regional economies depend. The productivity and health of ecosystems in the region is in decline overall, as indicated by provisional estimates of changes in net primary productivity, changes in ecosystems and also biodiversity.

51. Biodiversity is an important indicator of the health of ecosystems. It also provides critical ecosystem services. Although 2010 was designated the International Year of Biodiversity and the year by which the signatories to the Convention on Biological Diversity agreed to reduce biodiversity loss significantly, it is widely acknowledged that the 2010 target has not been met. The region has world’s highest number of threatened species, the most serious problems occurring in South-East Asia.

²¹ ESCAP calculation based on information from the Joint Monitoring Programme for Water Supply and Sanitation, 2010, available at www.wssinfo.org/datamining/introduction.html, accessed on 10 May 2010.

²² Including access to water and sanitation, health and the water use.

²³ Including water availability, vulnerability and risk (disaster, ecosystems and climate change), and investment capacity.

52. Significant changes are being observed in the region's forests, with accelerating degradation and loss of primary forests, and expansion of forest plantations based on non-native species much more evident in Asian countries, than in other regions. Mangrove forest cover has been reduced in most countries of the region, with the important exception of Bangladesh. Inadequate access to energy is intimately connected with the changes in forest ecosystems observed – wood removed from Asian forests is used mainly for energy, although alternative land uses are still the main incentive for deforestation.

53. The carbon sequestration services provided by forests are receiving increased attention and investment on international carbon markets. Large-scale planting of trees has resulted in a net gain in forest cover for Asia, but degradation and deforestation have resulted in large decreases in carbon stock in forest biomass.²⁴ Other globally and locally important ecosystem services, including biodiversity habitat, are also impacted. Locally important ecosystem services, such as disaster mitigation and watershed function regulation, are also likely to be reduced when forests in specific areas are degraded.

54. Some ecosystem changes observed regionally are due to climate change, including coral bleaching in South-East Asia. Coral reefs and associated species are an important basis for food security, but they have been affected by warmer, more acidic seawater and increased frequency of storm surges and cyclones.

55. The challenge of ensuring equitable benefits from resource use will become more critical as resources become scarcer. Losses in natural capital caused by increased demand for resources mean a double blow for those who are already vulnerable: firstly, they are denied access to resources, and, secondly, the ecosystem services on which they depend most directly are diminished.

56. Continuing high pressures on ecosystems indicate that strategies for ensuring ecosystem health must address underlying causes more directly. One of the key actions identified at the global level, and a critical action for this region, is “much greater efficiency in the use of land, energy, freshwater and materials to meet growing demand.”²⁵

F. Greening of growth – opportunities for policymakers

57. Despite the growing challenges, there are emerging opportunities for improving the sustainability of resource use patterns, and, by doing so, mitigating risk and reducing vulnerabilities.

58. Firstly, experience with market-based policies and market developments that help to redress the gaps between ecological and market prices is growing across the region. Eco-certification is an example of a response to a market demand for environmentally sound goods and services,

²⁴ FAO, Global Forest Assessment: Key Findings. 2010. Accessed at <http://foris.fao.org/static/data/fra2010/KeyFindings-en.pdf> on 12 March 2010.

²⁵ Convention on Biological Diversity Secretariat, Global Biodiversity Outlook 3: Executive Summary (Montreal, 2010).

with some consumers willing to pay a premium for certified products. Competitive forces are driving sustainability improvements in key industries, such as tourism, electronics (including information technology) and automobiles.

59. At the same time, stronger command and control policy frameworks that are needed for effective support of market instruments are increasingly evident, with aware and engaged communities and judicial systems playing an important role. The environmental market opportunities highlighted in ADB's 2006 *Asian Environmental Outlook* have been radically expanding as the challenges of operating in a carbon-constrained world become more apparent, and supply chains and consumers are increasingly aware and demand better corporate social and environmental responsibility.

60. Several decades of experience of community organization around issues such as rural development, community forestry and sustainable human settlements shows that community empowerment, knowledge networking and institutional innovations can provide localized solutions that improve the sustainability of resource management and socio-economic impacts. Reflecting the rapid explosion of information and communications technology, there has been a burgeoning of virtual communities and social and professional networks that can be harnessed to better catalyse change and accelerate the sharing of experiences.

61. Technologies, particularly renewable energy technologies, are maturing, and countries of the region are now global leaders in renewable energy technology production.

62. Sustainable infrastructure development represents one of the most important strategic opportunities. As Asian and Pacific developing economies are already planning to establish new infrastructure over the next decade, there is a narrowing window of opportunity to invest in eco-efficient infrastructure that will slow the growth in resource use but also deliver better infrastructure services over the next 20-30 years. Infrastructure investment requirements until 2020 in the Asia-Pacific region are estimated to range from \$4.7 trillion to \$8 trillion.²⁶ About two thirds of projected investment is for new infrastructure, which presents a great opportunity to design infrastructure according to principles of sustainability, including accessibility, eco-efficiency and social inclusiveness.²⁷

63. The greening of growth is increasingly accepted as both politically and economically feasible. Global and regional cooperation has been extended and strengthened by programmes such as the 3R Initiative of the Government of Japan. Green growth was endorsed by the fifth Ministerial

²⁶ Estimates are for ADB member countries only. The \$4.7 trillion estimate is from Jayant Menon, "Regional efforts to create an attractive investment climate; Presentation to Session III: Creating an Attractive Investment Climate in Southeast Asia, Second OECD-Southeast Asia Regional Forum, "Enhancing Competitiveness through Regional Integration" (Bangkok, 27-28 April 2009). The \$8 trillion estimate is from Asian Development Bank (ADB) and Asian Development Bank Institute (ADBI), *Infrastructure for a Seamless Asia*, Tokyo, 2009.

²⁷ The region's stimulus investments were concentrated in rail, energy grid and water and water management, and followed the global pattern in this regard. However, there is under-investment in green buildings and renewable energy in comparison with global investments, despite the great needs and opportunities in this area.

Conference as a pathway to sustainable development at a time when economies were growing rapidly and there had been notable gains in socio-economic progress. In the wake of the global economic recession, it has become even more evident that action on sustainability was needed. Economic recovery programmes and strategic actions outlined by intergovernmental organizations, think tanks and countries of the region emphasized the need to promote synergies between economic growth and environmental sustainability as had never been done before.

64. Asia-Pacific countries have led the world in their commitment to green investments in stimulus spending. China, the Republic of Korea, Japan and Australia were among the economies in the lead, along with the United States of America and the European Union, in particular Germany. Not only were two thirds of global green investments earmarked from Asia and the Pacific, but the region also earmarked the highest percentage of green investments in total stimulus investments, about 23 per cent.²⁸

65. Regional and international initiatives include the proposals for a Green New Deal, the UNEP-led Green Economy Initiative,²⁹ and the UNEP/ILO/IOE/ITUC Green Jobs Initiative report, which sparked interest in the potential for creating green jobs in developing countries.

66. Major forums have issued key statements of intent to promote green growth.³⁰ A total of 40 OECD member and prospective member countries representing 80 per cent of the global economy approved a declaration on green growth in June 2009. The General Assembly requested the Secretary-General to focus the upcoming Rio + 20 Summit on the theme of the green economy. The April 2010 ASEAN summit concluded in Hanoi with the adoption of the ASEAN Leaders' Statement on Sustained Recovery and Development. The statement documents the leaders' determination "to promote green growth, investments in long-term environmental sustainability, and sustainable use of natural resources in order to diversify and ensure resilience of our economy." In May 2010, the Commission adopted the Incheon Declaration (resolution 66/1).

²⁸ UNEP Green Economy Initiative based on data from HSBC Global Research, *A Climate for Recovery: The Colour of Stimulus Goes Green* (2009).

²⁹ Calls for a Green New Deal came from the Secretary-General in late 2008. UNEP issued a report on a global green new deal in which it called on governments to allocate a significant share of stimulus funds to green sectors, such as energy-efficient buildings, sustainable transport, renewable energy and energy-efficient technologies, ecological agriculture and water conservation, while the Department of Economic and Social Affairs of the Secretariat proposed a Global Green New Deal for Sustainable Development as "part of a broader counter-cyclical response to the crisis" specially directed to support developing countries.

³⁰ These forums have included the September 2009 International Conference on Green Industry in Asia, the January 2010 High-level Asia-Pacific Dialogue on the Brussels Programme of Action for the Least Developed Countries, the February 2010 Pacific High-level Dialogue on the Five-Year Review of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States and Pacific Conference on the Human Face of the Global Economic Crisis, and the March 2010 Asia Productivity Organization International Conference on Green Productivity to Enhance Competitiveness.

67. Among the countries that have prominently pursued and invested in green growth related strategies and policy reform are China, Japan and the Republic of Korea,³¹ with the Republic of Korea and Japan also establishing new international initiatives to support more environmentally sustainable economic growth. Many other countries in the region, including Cambodia, Fiji, Kazakhstan, the Maldives and Mongolia, have also made major policy statements supporting green growth.

II. Changing policy perspectives and strategic priorities

68. The five-year period since the last Ministerial Conference has shown that risks have increased as economic, resource and environmental challenges have converged. Although economies in the region have shown substantial resilience, the vulnerabilities of millions of people were exposed and further entrenched. The trends in resource use, the implications for people, and the inability of technological change to mitigate the environmental pressures, all underline the urgency of the challenges. The forces behind that convergence – the demand for resources and climate change – continue gathering strength.

69. The scale of the problem gives rise to the question whether the initiatives to promote green growth that are being made and proposed today will be sufficient to reduce environmental pressures and, at the same time, to achieve the stable and equitable socio-economic progress and improved quality of life that are still badly needed in this region.

70. Fundamental changes in the basic premises of conventional economic growth strategies have taken place, changes which incremental actions will not be sufficient to address.

A. Changing capital investment and resource-use strategies

71. Both ecological and labour prices have been undervalued. Neoclassical economic growth strategies based on cheap labour, cheap or free resources, and mass consumption are no longer economically, socially or environmentally sustainable in a context where natural capital is constrained.

72. While labour will become more abundant, supplies of natural resources (materials, energy and water) are coming under increasing pressure, and price increases and volatility will reflect increasing imbalances in supply and demand and political sensitivities. The average annual growth of labour productivity in the region between 1970 and 2005 was 2.1 per cent, among the fastest rates in the world. Energy productivity, on the other hand, grew at an annual rate of only 1.3 per cent and material

³¹ The Republic of Korea has adopted Low Carbon Green Growth as a national vision. The Government of China has passed framework legislation to support greener growth, including the Circular Economy Law (effective January 2009), the Renewable Energy Law, which increases capital investment for new and renewable energy development in areas such as hydropower, solar, biogas and other low-carbon energy sources in rural areas (effective January 2006), and an amendment to the Energy Conservation Law (effective April 2008) to include price and fiscal reforms in support of energy resource conservation.

productivity at only 0.8 per cent.³² The region therefore needs to greatly increase energy and resource productivity.

73. A new economic reality implies that eco-efficient economic growth and investments in natural and human capital to reduce risk and to strengthen human well-being improvements are strategic priorities. Strategies for managing resources should be rethought in the context of increasing scarcities and impacts on access to resources, and should also promote equitable access to resources.

B. Building resilience – grasping policy opportunities as a basis for transformation and adapting to environmental change

74. Transformational resilience—the ability to grasp the opportunities presented by a crisis and emerge in a better state than before—will determine the long-term outcomes for countries in the region. Not only must governments be able to better deal with uncertainty in the policy- and decision-making environment, they must also be able to build the capacity of stakeholders to deal with the increasing uncertainty. Policies and governance approaches that enhance the capacity of businesses and communities to grasp opportunities, to self-organize, and to adapt to changing conditions will be increasingly important.

75. One study notes that “managing for resilience enhances the likelihood of sustaining development in changing environments where the future is unpredictable and surprise is likely...Managing for resilience is therefore not only an issue of sustaining capacity and options for development now and in the future, but also an issue of environmental, social and economic security.”³³

C. Systemic changes - pricing, incentives and investments; production and consumption patterns, sustainable infrastructure development, adaptive and inclusive governance and policymaking

76. The scope of change required and the nature of the underlying challenges imply the need for systemic changes that will have long-lasting and significant impacts on resource use and investments in natural and human capital, rather than quick technological fixes. Green growth cannot be achieved by mainstreaming environment into current development patterns; it is about making fundamental changes to economic structures.

77. An initial boost to greening economic activities could be provided by green stimulus investments, development assistance loans and grants, and international financing to address climate change. Stimulus investments have been heralded as a major step towards greening growth, but much of the “green momentum” created may be lost unless underlying economic forces and financing mechanisms are directed towards keeping the green growth engine going, for it is those forces and mechanisms that influence

³² Calculations by CSIRO.

³³ C. Folke, S. Carpenter, T. Elmqvist, and others (2002), “Resilience and sustainable development: building adaptive capacity in a world of transformation”. Scientific background paper on resilience for the process of the World Summit on Sustainable Development, on behalf of the Environmental Advisory Council to the Government of Sweden.

the direction and form of other types of investments, which make up the bulk of investment in any economy.

78. The “invisible structure” of economies in the region therefore needs to change. Fiscal policies and resource prices, incentives and mechanisms for investments that promote eco-efficient and equitable growth are at the heart of successful green growth strategies. A qualitative and quantitative shift from investment in inefficient resource use to investment in human and natural capital is needed. Eco-tax reform initiatives, which try to influence resource use and redirect investments in resources towards more efficient use and towards investment in people can be observed in the region.³⁴ These actions represent important steps towards reducing exposure to uncontrolled resource price increases and, at the same time, investing in human capital and promoting more eco-efficient growth.

79. Longer-term benefits will accrue from investments in natural capital and human capital. Natural capital investments will, over time, help to secure critical ecosystem services, achieve cost savings on infrastructure development, improve economic, social and environmental sustainability and strengthen climate adaptation efforts through ecosystem-based adaptation approaches. Investment in human capital will be critical in creating green jobs as a key requirement for a green economy. Green jobs are defined by the ILO/UNEP Green Jobs Initiative as the direct employment created in economic sectors and activities which reduce their environmental impact and brings it down to levels that are sustainable. These jobs, to be considered green, should also meet the ILO criteria for decent work.

80. The “visible structure” of the economy—physical infrastructure—will also need to be developed on the basis of the principles of eco-efficiency and inclusiveness to provide human settlements and to deliver transport, water and energy services that boost socio-economic progress in an eco-efficient way. Urban development poses major challenges in terms of providing affordable housing, water and sanitation, and waste treatment services. Incorporating lifecycle cost analyses into planning and design will become more important as financial resource and land use limitations impose new constraints on development. Sustainable infrastructure development needs to be supported by appropriate financing mechanism and know-how.

81. The new environmental and socio-economic realities and the magnitude of the sustainability challenges show that Governments must take the lead, enabling the private sector to seize emerging opportunities, and engaging consumers in changing lifestyles without compromising quality of life.

³⁴ Under the Subsidies Law of the Islamic Republic of Iran, ratified in 2009, energy carrier prices are to be reformed (electricity, natural gas and gasoline). The savings on the subsidies are to be used for social security and for industrial renovation. Half of the savings will be used to expand health care and promote pro-poor cash transfers (estimated to amount to more than \$10 billion). About 30 per cent of the savings are earmarked for agricultural and industrial development (\$6 million). These investments are established in support of green growth and achievement of the Millennium Development Goals (source: statement by the Islamic Republic of Iran to the Commission at its sixty-sixth session). Indonesia has also reduced energy subsidies and directed savings towards pro-poor cash transfers.

82. Lifestyles and consumer preferences are fundamental determinants of consumption patterns that influence both resource use and quality of life. Sustainable consumption efforts should, rather than compromising the amount of consumption and reducing economic activity, improve the quality of consumption. Notions such as dematerialization are important, along with investment in natural and human capital. Traditional cultural values can provide valuable approaches to sustainable consumption in a globalizing consumer society, as in the case of Bhutan (gross national happiness), Japan (mottainai) or Thailand (sufficiency economy).

83. Low carbon, green growth is a key strategic response to the uncertainty arising from the convergent challenges facing the region. Low-carbon development strategies can be viewed as a specific type of green growth strategy designed to focus on mitigating climate change. Common elements of low carbon strategies include an optimal mix of (a) reducing demand; (b) moving away from carbon-intensive fossil fuels and their associated GHG emissions; (c) continuing to meet the development needs of all groups in society, but especially those of the poor and vulnerable; (d) ensuring energy security and (e) maintaining important carbon sinks, such as forests.³⁵

84. Governance refers to the ways in which institutional structures, processes and policies shape and facilitate individual and collective action. Adaptive governance, facilitates learning, brings diverse sources and forms of knowledge together and so builds the capacity of businesses, people and communities to cope with environmental change and transform community capacities for the better in the face of crisis. Institutions and policies that facilitate and empower community action by harnessing local knowledge and making financial resources locally available for effecting change, are increasingly important.

III. Conclusions

85. The convergent challenges faced by the region threaten to seriously undermine the achievement of the elusive goal of sustainable development. The present report shows that regional economic growth strategies over the next few decades are critically important not only for the future of the region's people, but also for the globe. Patterns of resource use, limited access to energy, limited resource endowments, climate change and a decline in the ability of ecosystems to provide critical ecosystem services, all work together to deepen the vulnerability of certain countries and groups of people in the region. While millions continue to struggle to escape poverty, and as resources become increasingly scarce, it is essential to use the planet's resources (including waste absorption capacities) wisely for the benefit of all.

86. The convergent challenges, new incentives, technologies and awareness and support from stakeholders are beginning to change the economic, market and policy landscapes and now present significant

³⁵ Because of its rich endowment of forests and commitment to maintaining them, but also reflecting its relatively low per capita GDP, Bhutan has been able to declare itself carbon-neutral (emitting less carbon than its land use absorbs), although challenges in maintaining this status are acknowledged.

opportunities for the region's policymakers to rethink sustainable development strategies. The green economy needs to be built on reoriented values, including an emphasis on the quality of life and new skills and capacities to meet the growing demand for green jobs. Education for sustainable development needs to be extended to all levels of society, from schools to on-the-job training.

87. How the strategic priorities identified in the present report are approached by policymakers will differ, depending on the situation in each country. Levels of development, resource endowments, resource efficiency trends, the impact of resource use on boosting socio-economic progress, vulnerability to environmental change, in particular climate change, as well as the opportunities presenting, will define the implementation of these strategies.

88. In developing countries of the region, especially those with serious resource constraints, there is a need to use resources better to meet needs in an inclusive way and to increase resource efficiency where those resources are at the same time constrained and used inefficiently. Increasing access to renewable energy and sustainable infrastructure development are important priorities for many countries, particularly in South Asia. A redoubling of efforts to improve resource efficiency is needed in both high- and middle-income countries.

89. Above all, the future of the people of Asia and the Pacific depends on the region's growth trajectory and resource consumption patterns. The region's economic future, in turn, depends on globalized markets, so global cooperation needs to consider Asia-Pacific development priorities and recognize the region as an equal partner. The policy measures outlined in the present report need to converge and move in a single direction — a destiny in which Asia-Pacific countries act in accordance with nature and the ecological principles on which all human beings depend.
