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**Solutions to accelerate progress with respect to the
environmental dimensions of the 2030 Agenda for
Sustainable Development****Solutions to accelerate progress with respect to the
environmental dimensions of the 2030 Agenda for
Sustainable Development in Asia and the Pacific****Note by the secretariat***Summary*

The present document provides examples of technical solutions to harness the benefits of environmental action in order to accelerate progress on achieving sustainable development, highlights the value of regional cooperation and of the means of implementation of the 2030 Agenda for Sustainable Development on implementing such solutions and puts forward issues for consideration by the Committee.

**I. Overview of solutions to accelerate progress with respect
to the environmental dimensions of the 2030 Agenda for
Sustainable Development in Asia and the Pacific**

1. Documents ESCAP/CED/2018/1 and ESCAP/CED/2018/2 review the environmental impacts the region is experiencing, and identify opportunities and benefits that can accrue from environmental actions, in the areas of resource efficiency, circular economy, ecosystem conservation and restoration and climate action. The present document takes a further step by presenting specific solutions that could be undertaken in these areas to harness the benefits of environmental action. It also highlights the value of regional cooperation and utilizing the means of implementation of the 2030 Agenda for Sustainable Development to implement such solutions.

* ESCAP/CED/2018/L.1.

2. Improving efficiency in the management of natural resources (materials, energy and water) delivers direct benefits by reducing the demand for these resources and generating cost savings, and can deliver important co-benefits such as reduced greenhouse gas emissions, limited price volatility of resources, control of air and water pollution and generation of jobs.

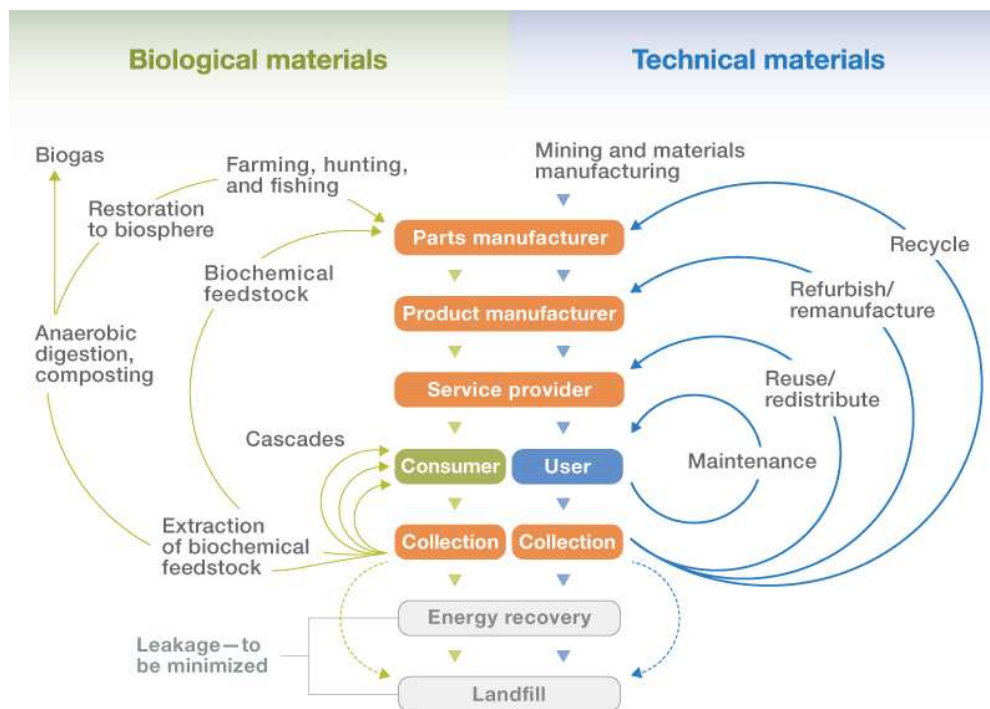
3. A circular economy approach advocates a shift from a linear production and consumption system – the “take, make and dispose” extractive industrial model, which generates a lot of waste, with most of the value in materials used lost to landfills and resources being consistently underutilized. The waste generated through these ineffective processes brings about additional costs due on municipal budgets and has negative environmental impacts, including air, water and noise pollution, release of toxic substances and greenhouse gas emissions.¹ Conversely, a circular economy entails gradually decoupling economic activity from the consumption of finite resources and is based on three principles: design out waste and pollution, keep products and materials at their highest value and in use, and regenerate natural systems.² A circular economy distinguishes between two cycles of materials: biological and technical (see figure). Biological cycles contain those materials that can safely cycle in and out of the biosphere (including food, fibres, and bio-based construction materials, such as wood). Technical cycles contain flows of materials that cannot be appropriately returned to the biosphere (such as plastics and metals found in products ranging from engines to washing machines to mobile phones).³

¹ Ellen MacArthur Foundation, “Cities in the circular economy: an initial exploration” (Cowes, United Kingdom, 2017).

² Ellen MacArthur Foundation, “Circular economy overview”. Available at www.ellenmacarthurfoundation.org/circular-economy/overview/concept.

³ Ellen MacArthur Foundation, *Urban Biocycles* (Cowes, United Kingdom, 2017).

Towards a circular economy⁴



4. A main approach to promote conservation and restoration of ecosystems is by applying nature-based solutions as a means to harness the full potential of ecosystems and nature in general to support sustainable development. Such solutions protect, sustainably manage, restore natural or modified ecosystems and aim to address societal challenges effectively and adaptively while providing human well-being and biodiversity benefits.⁵ Nature-based solutions involve the application of knowledge about the features and processes of nature in work, towards options for future actions that are resilient, resource efficient and attuned to local conditions and needs. They build on two premises: (a) some societal challenges stem from human activities that have failed to recognize ecological limitations; and (b) sustainable alternatives to those activities can be found by looking to nature for design and process knowledge. As such, nature-based solutions are inspired and supported by nature, and they maintain and enhance natural and social capital.

5. Climate action is a prerequisite for a sustainable future and the achievement of the Paris Agreement on Climate Change will determine, and at the same time, be influenced by the success of implementing the 2030 Agenda and the Sustainable Development Goals. Both mitigation and adaptation will be necessary to tackle the negative impacts of climate change. In a region that is a main contributor to greenhouse gas emissions as well as very vulnerable to climate change impacts, any short-term development benefit could be compromised in the long term by the absence of climate action.

⁴ World Economic Forum, *Towards the Circular Economy: Accelerating the Scale-Up Across Global Supply Chains* (Geneva, 2014).

⁵ International Union for Conservation of Nature, “Nature-based solutions”. Available at www.iucn.org/commissions/commission-ecosystem-management/our-work/nature-based-solutions.

6. For these technical solutions to be effectively applied in the Asia-Pacific region, they should be delivered by means of regional cooperation platforms and integrated into the means of implementation of the 2030 Agenda. The platforms of the Economic and Social Commission for Asia and the Pacific (ESCAP), such as the Ministerial Conference on Environment and Development, the regional road map for implementing the 2030 Agenda for Sustainable Development in Asia and the Pacific, and the Asia Pacific Forum on Sustainable Development and other forums, provide opportunities to effectively deliver technical solutions and integrate them into the means of implementation of the 2030 Agenda.

II. Promoting resource efficiency

A. Resource efficiency in cities

7. Since 2013, the ESCAP Environment and Development Division has been promoting integrated resource management in cities throughout the implementation of the Urban Nexus project, which responds to the challenges of increasing resource scarcity and waste and sanitation problems by working with local and subnational governments and national Governments to advance cross-sectoral infrastructure solutions and integrated planning and policies by capitalizing on interdependencies between water, energy and food and optimizing efficiencies, minimizing trade-offs and using waste as a resource.

8. The project has supported or is supporting more than 50 studies in partner cities to identify cost-effective ways and specific infrastructure solutions to integrate the nexus approach into urban planning and development processes to improve urban services. Through the project's technical assistance, 12 cities in China, India, Indonesia, Mongolia, the Philippines, Thailand and Viet Nam have started 35 on-site initiatives with an estimated investment cost of \$460 million. Solutions include mechanical and biological solid waste treatment and waste-to-energy projects, vacuum sewer technology and reuse of wastewater, renewable energy, building energy efficiency, and energy and water efficiency improvements in water and wastewater systems.

9. The project has reached more than 2,000 local and national policymakers and other stakeholders through convening national and regional policy dialogues to promote horizontal and vertical integration, coordination and collaboration between sectors and different government levels, and organizing outreach events at key regional and global conferences. Tanjungpinang in Indonesia is preparing a local action plan that includes the nexus approach to align with national goals and support implementation of interrelated targets with respect to Sustainable Development Goal 6 on clean water and sanitation and Sustainable Development Goal 11 on sustainable cities and communities. Viet Nam adopted legislation supporting the nexus, namely, a decree on management of waste and refused items, which aligns with the principles of a circular economy approach.

10. Academic institutions are also engaging with the project. For example, through the Urban Nexus project, Bicol State College of Applied Sciences and Technology in partnership with Naga City developed the Climate Change Resilient Pilot House to provide a low-cost, environmentally friendly alternative to conventional social housing in the Philippines. The pilot house employs modular architecture systems and hollow concrete blocks, climate-adaptive and energy-efficient devices, natural ventilation and daylight, rainwater harvesting, and other innovations, resulting in very sizeable

reductions in the use of concrete (40 per cent), steel (30 per cent), water (30 per cent) and waste (30 per cent).

11. In Chiang Mai, Thailand, the city retrofitted more than 60 conventional fountain pumps in the city's moat with energy efficient technology, resulting in annual electricity savings of approximately \$90,000 and a return on investment of less than three years. The city of Ulaanbaatar is securing resources to support residential and public building thermo-technical retrofits that would result in heat energy and greenhouse gas emission savings of up to 50 per cent.

12. An urban nexus training programme based on the project's experience is also being planned for future learning and replication in the region. Some of the project's emerging good practices and viable solutions can be used by other cities in the region.

B. Addressing water pollution by industries

13. Another example of the ESCAP Environment and Development Division's support for member States targets cleaner production to address one of the key environmental challenges in the region: water pollution. An Environment and Development Division project focuses on the manufacturing sector, as it is forecasted to see the largest increase (of 65 per cent) in water use by 2030 compared with other sectors in the economy and is a driver of growth in Asia and the source of critical environmental problems in the region, including the surge of water resource use and pollution. The project also stems from the fact that the industrial sector in Asia is poised to undergo vast transformations owing to economies such as China transitioning from industrial to more service-oriented/high-technology economies. This entails a migration of labour and resource intensive manufacturing industries to other countries within the region. Consequently, several developing countries in the region, such as Bangladesh, Cambodia, Indonesia, Laos, Myanmar, Pakistan and Viet Nam, are witnessing significant expansion of their manufacturing sectors.

14. To ensure that appropriate environmental policies and regulations are in place to reduce the environmental impact in these emerging production bases, the project has identified key industries to focus on as the most relevant sectors given their water usage, pollution potential and importance in national economies of the targeted countries. These are food production, pulp and paper, textile and chemical industries. The project analyses the Chinese experience in developing policies for managing the environmental impact of these industries as a basis for South-South learning and experience-sharing with the target countries through knowledge product development and regional training.

C. Enabling sustainable food systems through mechanization solutions for production and processing

15. Sustainable agricultural mechanization in Asia and the Pacific offers innovative and economically viable opportunities for growers, consumers and other stakeholders across the entire food system, including in the context of limited land and water resources.

16. Through its regional institute, the Centre for Sustainable Agricultural Mechanization, ESCAP is enabling policy dialogue amongst member States, supporting the establishment of harmonized regional codes for the testing of

agricultural machinery, strengthening the capacities of technicians and private sector industry associations, promoting the availability of data, establishing multi-stakeholder networks for knowledge exchange and collaboration, and addressing emerging issues such as the burning of straw residue. Document ESCAP/CED/2018/INF/1 provides further details of this issue.

III. Transitioning to a circular economy

17. Increasing circularity in cities can relieve pressures on municipal services and budgets, encourage innovation and new business models in the urban economy, reduce emissions and improve air quality, increase liability, and increase employment opportunities. Circular economy solutions can thus have economic, social, and environmental benefits for Asia-Pacific cities and support the needed localization of the Sustainable Development Goals.

18. One of the focuses of ESCAP work to promote a circular economy has been on single-use plastics, given the major environmental impact of plastic pollution throughout the region. Inclusive circular economy solutions can be particularly beneficial for Asia-Pacific cities in the area of plastics by helping to unlock the potential of the informal sector. Informal industries already essentially serve as miniature circular economies in many instances and account for 60 per cent of the workforce in the region.⁶ The informal sector provides employment and livelihoods for impoverished, marginalized and vulnerable individuals or social groups. The informal recovery of valuable plastic and other waste resources throughout the waste value chain is a significant, yet largely marginalized, contribution to circularity in waste management that relies on simple techniques and equipment. Recycling performed by the informal sector also provides savings to municipalities and formal waste management systems by reducing the volume of waste to be collected, transported and disposed of, resulting in lower labour, transport and infrastructure costs. Widespread recognition of the waste pickers' contribution to the environment and city service provision has been received in many cities in India and in other countries, with support from local governments.

19. To this effect, the ESCAP Environment and Development Division supports countries in the region with a “closing the loop” project aimed at unlocking the informal economy to recover plastic waste and reduce marine pollution as part of an inclusive circular economy approach. The project develops case studies for pilot cities (Pune, India and Bangkok), where a value chain analysis is conducted to identify opportunities to link the informal and formal waste sectors through an evidence-based inclusive circular economy approach, and where the environmental, social and financial impacts of plastic management are assessed. In Pune, the study has demonstrated that informal waste pickers divert 58,032,000 tons of waste per year from landfill, representing the equivalent of 152,528 million tons of carbon dioxide over a year, corresponding to the annual emissions from an estimate of 32,111 passenger vehicles.⁷ The assessment will serve as the basis for developing policy recommendations to strengthen engagement with the informal sector with a view to reducing plastic leakage into the natural environment. A practical guidance tool with evidence-based policy recommendations is being developed based on the case studies and will be

⁶ International Labour Organization, “Informal economy in Asia and the Pacific”. Available at www.ilo.org/asia/areas/informal-economy/lang--en/index.htm.

⁷ Based on data collected by local partners Kashtakari Panchayat in Pune as part of ESCAP's Closing the Loop project. Results will be included in a case study for Pune, see ESCAP and others, *Closing the Loop: Pune Case Study* (forthcoming).

shared during a regional capacity-building workshop to support best practices and experience-sharing on this resource-efficient, circular approach with other countries in the region.

20. This project complements the fight against single-use plastics in the region and has already been taken up by a number of member States and initiatives supported by United Nations agencies, including the United Nations Environment Programme. For example, Bangladesh banned the production, sale and use of polyethylene bags in 2002, first in Dhaka and later nationwide. Delhi, Bombay and several other States in India have also enacted bans on plastic bag distribution, use and disposal. In Hong Kong, a mandatory 50 Hong Kong cents (\$0.06) plastic bag levy was introduced in 2007 and was extended in 2015 from supermarkets and convenience stores to approximately 100,000 retailers. The Government of the Republic of Korea also announced comprehensive countermeasures to reduce plastic waste in April 2018. Given the difficulties experienced in recycling plastic from plastic bottles, which entails removing colours, the adopted measures include a halt in production of coloured plastic bottles. Focusing on consumption, the Government also aims to reduce use of disposable cups and plastic bags by 35 per cent before 2022. Also, large markets and grocery stores will be banned from using plastic bags starting October 2018 and are requested to minimize packaging.

21. ESCAP has also implemented the “Pro-poor and sustainable solid waste management in secondary cities and small towns in Asia-Pacific” project to assist nine secondary cities and towns in six countries (Bangladesh, Cambodia, Indonesia, Pakistan, Sri Lanka and Viet Nam) to recover the maximum ecological and economic value of waste and reduce associated greenhouse gases by establishing integrated resource recovery centres – decentralized neighbourhood-based compost plants that serve as cost-effective and environmentally sustainable models that use simple technology to utilize organic waste in waste-to-resource recovery systems.

22. Another area in which circular economy solutions can be applied is related to manufacturing and industrial development. Industrial symbiosis as a circular economy method is an association between two or more industrial facilities in which wastes or by-products of one become raw materials for another. The process allows firms to reduce input costs and generate revenue from waste, with surplus resources generated through one industrial process captured and redirected for use as an input for another organization. An application of this process is demonstrated in the Suzhou Industrial Park which was selected to pilot China’s national circular economy programme. More than 16,000 companies, including 4,000 manufacturing firms, in this eco-industrial park were incentivized to link their supply chains and share water, energy, and their waste and recycling processes; for example, one company’s waste copper was used by another to make electronic circuits. This industrial symbiosis resulted in 96 per cent of solid waste produced in the park being used elsewhere and decreased sulphur dioxide emissions by 38 per cent and organic water pollutants by 47 per cent.

23. Applying industrial symbiosis is an enabling factor for circular industries. This would involve: measures such as setting targets for waste reduction and resource efficiency in order to drive progress throughout the public and private spheres; reforming tax systems so that they perform better in discouraging undesirable activities, such as pollution or waste; encouraging desirable activities, such as establishing circular business models; and revising existing policies that inhibit circular business models for waste, such as free landfill collection or unnecessary restrictions on treatment of human waste.

IV. Conserving and restoring ecosystem services

24. Ecosystem conservation and restoration efforts are being undertaken in Asia and the Pacific, in particular through the biodiversity-related Conventions⁸ and through the delivery of the Global Environment Fund's portfolio by 18 agencies.⁹

25. Nature-based solutions, as presented below, focus on harnessing and mimicking the way nature works to support the conservation, restoration and sustainable management of ecosystems and the services they provide in Asia and the Pacific.

26. Such solutions are applied to integrated coastal city planning, disaster-risk reduction, ecosystem-based adaptation to climate change, as well as sustainable water management, and provide multiple environmental, social and economic co-benefits.

A. Integrating nature-based solutions into planning for coastal cities

27. Cities and settlements along coastlines and in islands face a complex set of ecological and sustainable development challenges at the intersection of land and seascapes, including the effects of climate change and unplanned urbanization on coastal erosion and degradation of marine and coastal ecosystems. Integrating nature-based solutions into urban development in coastal cities offers opportunities to bridge the natural and built environments and to generate multiple social, economic and environmental benefits. For instance, conserving and rehabilitating mangroves, seagrass beds and coral reefs on city shores instead of, or in combination with, built sea walls, not only increases cost-effective urban resilience by reducing impacts of storm surges and coastal flooding, but also stabilizes eroding coastlines; filters run-off and waste leakage into the ocean and reduces eutrophication; provides nursery grounds and habitats essential for biodiversity, food security and reef-based tourism; and preserves vital carbon sinks to balance the climate. Integrating green public spaces along coastlines into urban planning can create an additional line of defence against sea-level rise, while providing spaces for healthy recreation and tourism, community engagement in coastal agroforestry and ecosystem conservation, and ecosystem education for youth. Nature-based solutions can complement "grey" infrastructure for urban services in informal settlements on coastlines, including by improving the quality of city water catchment from ridge to reef and using biofilters to treat wastewater.

28. Nature-based solutions are often adopted in the region for the integral part they can play in disaster risk reduction in coastal cities. Experiments have shown that a 100-metre belt of dense mangroves could reduce the destructive

⁸ The Convention on Biological Diversity, the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the International Plant Protection Convention, the International Treaty on Plant Genetic Resources for Food and Agriculture, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, and the Convention for the protection of the world cultural and natural heritage.

⁹ See www.thegef.org/partners/gef-agencies.

energy of a tsunami by as much as 90 per cent.¹⁰ In Japan, the 2011 earthquake and tsunami stimulated the promulgation of a new law on national resilience that promotes ecosystem-based disaster risk reduction. New approaches to disaster risk reduction were adopted, including the proposed establishment of coastal parks to provide multiple built and natural lines of defence between residential areas and the coast, including rows of elevated green belts and a sea wall. Ecosystem-based disaster risk reduction proves a worthwhile approach in the region: a cost-benefit analysis in Viet Nam estimated that investing in 12,000 hectares of mangroves to protect the coast was much cheaper than infrastructural developments (\$1.1 million compared with \$7.3 million for the maintenance of dykes)¹¹ and regardless of a disaster occurrence, ecosystem-based disaster risk reduction is promoted as a “no-regret” option given the multiple benefits it provides in terms of conservation, livelihoods, climate change adaptation and food security.¹²

B. Nature-based solutions for water

29. As part of its support for the global UN-Water initiative that coordinates the efforts of United Nations entities and international organizations working on water and sanitation issues, the ESCAP Environment and Development Division promotes the dissemination of the latest UN-Water knowledge products, and supports the uptake of its recommended innovative water-related policy approaches. This includes the recommendations of the latest *World Water Development Report* published in 2018 that promotes nature-based solutions for water.¹³

30. The report stems from the assessment that new solutions, including green infrastructure, are needed to manage water resources in order to offset the rising challenges to water security from population growth and climate change, especially in urban areas. It makes the case for the drastic positive environmental impact of nature-based solutions in terms of effectively managing water availability, water quality and water-related risks. It also highlights the multiple co-benefits of these solutions in terms of food security, disaster risk reduction, climate change mitigation and adaptation and decent work creation.

31. Other nature-based solutions for water look at addressing quality by strengthening natural water treatment processes provided by wetlands, both natural and constructed, and riparian buffers. Constructed wetlands apply

¹⁰ Tetsuya Hiraishi and Kenji Harada, “Greenbelt tsunami prevention in South-Pacific region”, *Report of the Port and Airport Research Institute*, vol. 42, No. 2 (June 2003).

¹¹ Fabiola Monty, Radhika Murti and Naoya Furuta, *Helping Nature Help Us: Transforming Disaster Risk Reduction through Ecosystem Management*, Gland, Switzerland, International Union for Conservation of Nature and Natural Resources, 2016.

¹² International Union for Conservation of Nature and Natural Resources (IUCN), “Transforming disaster risk reduction through ecosystem management in Asia”, Policy Brief (Bangkok, IUCN Asia Regional Office, 2017).

¹³ UN-Water, *The United Nations World Water Development Report 2018: Nature-based Solutions for Water* (Paris, United Nations Educational, Scientific and Cultural Organization, 2018).

engineered solutions to cleanse wastewater using vegetation and soils designed to mimic natural processes.¹⁴

32. Cities in China are applying the “sponge city” concept to manage urban water cycles through nature-based solutions. Using green roofs and special pavements in conjunction with engineered bioremediation and restoration of urban and peri-urban wetlands and rivers, sponge cities manage water to mitigate flooding risks and address water scarcity issues. The programme envisions 80 per cent of China’s urban built-up area to be sponge-like by 2030, with 30 pilot cities involved.¹⁵ Despite the fact that 1 square kilometre of sponge city redevelopment costs 100 to 150 million yuan (13.5 to 20 million euros),¹⁶ the environmental (flooding and water quality management), economic and social benefits are deemed sound investments from a public perspective (benefit-cost ratio under 1).¹⁷

V. Climate action

33. This section presents solutions and opportunities in the region to mitigate climate change and adapt to inevitable impacts. Overall, the Asia-Pacific region contributes significantly to the production of greenhouse gas emissions and is also highly vulnerable to its impacts. These trends highlight the urgent need to transition towards low carbon development, alongside measures to strengthen resilience to increasingly extreme and frequent natural disasters and storms in the region.

A. Mitigation

34. The energy sector remains the largest emitter in Asia and the Pacific, followed by agriculture and land use change, such as from rice cultivation and deforestation. Solutions with the largest potential impact include transitioning to renewable energy sources for electricity, transport and agricultural processes; increasing energy efficiency in industry and buildings; more circular models of resource use and improved waste management. These solutions should be complemented by a sharp increase in efforts to conserve and restore ecosystems that provide vital carbon sinks such as forests threatened by legal and illegal agricultural expansion (palm oil) and extractive industries (such as pulp and paper industry, mining), as well as oceans and peatlands.

35. Technology solutions to enable access to sustainable energy and meet rising energy demand in the region, will need to focus on renewable sources of energy. The declining cost of renewable energy technologies, such as solar photovoltaics and wind, offers a cost-effective alternative to extending networks to outlying and often challenging geographical locations. The

¹⁴ Jan Vymazal, “Constructed wetlands for wastewater treatment”, *Water*, vol. 2, No. 3 (September 2010).

¹⁵ ICLEI – Local Governments for Sustainability, “China’s sponge city concept: restoring the urban water cycle through nature-based solutions”, ICLEI Briefing Sheet (March 2017). Available at http://old.iclei.org/fileadmin/PUBLICATIONS/Briefing_Sheets/Nature_Based_Solutions/ICLEI_Sponge_City_ENG.pdf.

¹⁶ Ibid.

¹⁷ Xiao Liang, “Integrated economic and financial analysis of China’s sponge city program for water-resilient urban development”, *Sustainability*, vol. 10, No. 3 (March 2018).

required growth in renewable energy poses a technical challenge associated with the capacity of existing electricity networks – the interconnection of grids can help to expand the balancing areas, enable cross-border power supplies and improve energy security. Current initiatives in progress include the Lao People’s Democratic Republic-Thailand-Malaysia-Singapore Interconnected Grid and the Asia Super Grid. Distributed renewable energy systems can help to reduce greenhouse gas emissions and the fiscal burden created by fossil fuel subsidies. Technology choices for access to clean cooking fuel include biogas digesters, which can also improve agricultural productivity, liquefied petroleum gas stoves, and more energy efficient improved biomass cookstoves.¹⁸

36. Improvements in energy efficiency to lower final energy consumption can help to increase the share of renewable energy – if the energy intensity is reduced by an additional 25 per cent by 2030, the share of renewable energy may increase by a further 7 per cent assuming no additional investment in renewable energy.¹⁹

37. The International Renewable Energy Agency estimates that doubling renewable energy globally could save up to \$ 4.2 trillion per year, which is 15 times the investment required in renewable energy.²⁰ Investments in renewable energy and clean efficient energy solutions can include market mechanisms, such as feed-in tariffs, to stimulate green markets. Public-private partnerships in energy infrastructure projects, such as the “build-operate-transfer” model, can reduce investment risks and incentivize private investment. Countries such as Thailand are working with energy services companies through revolving funds to assist the diffusion of renewable energy. A long-term vision for developing a regional emission trading market is a key avenue worth exploring – a carbon tax of \$25.7 per ton of carbon dioxide emissions, together with savings from phasing out fossil fuel subsidies, could be sufficient to meet the entire investment needed for renewable energy.

38. Sustainable waste management in the face of rapid urbanization is a central entry point for reduction of greenhouse gases. An analysis of the nationally determined contributions communicated to the United Nations Framework Convention on Climate Change shows that 32 member States and two associate members of ESCAP prioritize accounting for national waste-related emissions. Of these, 24 member States and two associate members have mentioned specific planned or ongoing actions, such as existing national programmes or planned strategies to reduce waste sector emissions. Ongoing actions include: waste minimization; improved solid waste management; waste-to-energy conversion; and waste-to-resource recovery for mitigating greenhouse gas emissions and building low-carbon climate resilient societies.

39. Safeguarding ecosystems and biodiversity is a strategic way of both mitigating climate change – by using ecosystem services to reduce greenhouse gas emissions and enhance carbon sinks – and adaptation – by conserving ecosystem services that are vital to prosperity and well-being and reducing the impact of climate change. Nature-based solutions to reduce emissions include

¹⁸ *Energy Transition Pathways for the 2030 Agenda in Asia and the Pacific: Regional Trends Report on Energy for Sustainable Development 2018* (United Nations publication, Sales No. E.18.II.F.14).

¹⁹ *Ibid.*

²⁰ International Renewable Energy Agency, *Roadmap for a Renewable Energy Future: 2016 Edition*. (Abu Dhabi, 2016).

improved land use and management such as low emissions agriculture, agroforestry and ecosystem conservation and restoration.²¹ Degradation of natural ecosystems, on the other hand, has negative impacts on the climate. Degraded carbon-rich soils such as peatlands used for agriculture and deforestation of terrestrial forests and mangroves release emissions into the atmosphere.

40. Marine and coastal ecosystems, including mangroves, seagrass beds and coral reefs, store 10 times more carbon than continental forests, yet they have long been overlooked. The ocean is the largest carbon sink in the world; however, the continued rise in water temperatures and ocean acidification through the human-induced rise in emissions – paired with rampant pollution and overfishing – is weakening the ocean’s ability to balance the climate and perform critical ecosystem services.

B. Adaptation

41. Asia and the Pacific is the most disaster-prone region in the world. Alongside low-carbon development strategies, countries need to build their adaptive capacity and resilience to climate change impacts. Solutions include early warning systems; risk communication between decision-makers and local citizens; sustainable land management and ecosystem management and restoration: improvements in water supply, sanitation, irrigation and drainage systems; climate-proofing of infrastructure and strengthening of coastlines; development and enforcement of building codes; and better education and awareness.²²

42. The destructive Indian Ocean tsunami that occurred in December 2004 showed the need for an effective regional disaster preparedness mechanism in the Indian Ocean and South-East Asia. The ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness was established in 2005, originally to support tsunami early warning through a multi-hazard approach. In 2010, the scope of the Fund was broadened to include overall disaster and climate preparedness within the Fund’s core areas of support. The Fund contributes to narrowing the capacity gaps in the region and ensures the development of an integrated regional early warning system.²³

43. The Pacific has the highest urbanization rate of global small island developing States today (at 4.3 per cent per year), with 50 per cent of the population, some 7.5 million people, living in coastal settlements – half the coral reefs that are already under acute stress from ocean warming and acidification are under severe threat by unsustainable coastal development and accompanying marine pollution. Vital urban infrastructure and livelihoods are increasingly threatened by climate change impacts, with disaster risks fast outpacing resilience. Annual economic losses from disasters are expected to cost small island developing States close to 4 per cent of their gross domestic product. To address these challenges in “ocean cities”, ESCAP is piloting an integrated policy approach for ocean-focused climate-responsive urban development adapted to island systems in partnership with Pacific island States. Through a series of consultations and knowledge products, the initiative

²¹ Johan Rockström and Tristan D. Tyrrell, “Nature-based solutions for better climate resilience: the need to scale up ambition and action”, Expert Perspective for the NDC Partnership (April 2017).

²² *Leave No One Behind: Disaster Resilience for Sustainable Development – Asia-Pacific Disaster Report 2017* (United Nations publication, Sales No. E.17.II.F.16.).

²³ See www.unescap.org/disaster-preparedness-fund.

supports local policymakers to promote urban resilience and protect ocean-based livelihoods in ocean cities by integrating nature-based solutions, valuing ecosystem services, and engaging local stakeholders and communities.

44. Preserving the productive base of natural resources and ecosystem services (for example, for agricultural productivity) is vital to ensure sustainable development. Strategies for achieving resilient agriculture include: developing seed banks and adopting strategies to maintain a wide range of species to allow for adaptation to various climates and boosting productivity with stress-tolerant varieties; adjusting planting dates and expanding water harvesting, storage, and conservation; and insurance and social protection schemes for farmers.²⁴

45. Ecosystem-based adaptation is a nature-based solution that seeks to harness the potential of healthy ecosystems and biodiversity to strengthen social and ecological resilience. The Pacific Ecosystem-based Adaptation to Climate Change project implemented by the Secretariat of the Pacific Regional Environment Programme explores and promotes ecosystem-based options for adapting to climate change in the Pacific. In Fiji, the Solomon Islands and Vanuatu, the initiative aims to integrate these solutions into development, climate change adaptation responses, and natural resource management policy and planning processes, building on ecosystem and socioeconomic resilience analysis and mapping, prioritization and demonstration of benefits such as urban and peri-urban agroforestry, and ecosystem-based water and sanitation solutions.²⁵

VI. The value of regional cooperation and the means of implementation to accelerate environmental action in Asia and the Pacific

46. This section presents the support that the ESCAP Environment and Development Division provides regionally through knowledge exchange, capacity-building and technical assistance for strengthening regional cooperation on environment and development and supporting the application of the specific technical solutions in the areas of resource efficiency, circular economy, conserving and restoring ecosystems and climate action.

A. Strengthening regional cooperation on environment and development

47. Regional cooperation is critical to contextualize and implement environment and development policies in a coherent and integrated manner since neither the environment nor markets are confined to physical borders or boundaries. The secretariat is supporting regional environment partnership initiatives to address shared challenges on environment and development with agreed common regional actions, which have originated at Ministerial Conferences on Environment and Development.²⁶ Implementation of those initiatives enhanced the capacity of regional policymakers from countries with special needs to develop coherent environment and development policies.

²⁴ *Leave No One Behind: Disaster Resilience for Sustainable Development.*

²⁵ For resources and information, see www.sprep.org/pebacc.

²⁶ The Ministerial Conference on Environment and Development in Asia and the Pacific has been convened at five-year intervals over the past 30 years.

48. Some of these initiatives are: the Kitakyushu Initiative for a Clean Environment, which enabled the exchange of good practices between cities; the Seoul Initiative Network on Green Growth, which built capacity regarding green growth approaches; the Astana Green Bridge Initiative and its Green Bridge Partnership Programme, which established a trust fund supporting community-managed sanitation and renewable energy in nine small island developing States.

49. The Seventh Ministerial Conference on Environment and Development was pivotal for enhancing the environmental dimension of sustainable development and driving for a stronger convergence with efforts to implement the 2030 Agenda. At the request of member States, the Ministerial Conference was organized jointly by ESCAP and the United Nations Environment Programme as an integral component of the first Asia-Pacific Ministerial Summit on the Environment and was held in Bangkok in September 2017. The Ministerial Summit focused on addressing the linkages between resource efficiency and pollution reduction in Asia and the Pacific, under the theme “Towards a resource efficient and pollution free Asia-Pacific”.

50. The Ministerial Declaration on Environment and Development for Asia and the Pacific highlighted the need for strengthened regional cooperation to address a number of environmental challenges and identified specific areas of work as well as areas for which the secretariat should provide support.

51. The secretariat continues to foster subregional cooperation to advance regional and regional initiatives that are sponsored by member States and promote coherent policies for environmentally sustainable development. The secretariat supports the Association of Southeast Asian Nations (ASEAN)-United Nations Environment and Climate Change Action Plan through the Regional Coordination Mechanism and its Thematic Working Group on Resource Efficient Growth to identify synergies in the delivery of United Nations and ASEAN activities to support the implementation of the Action Plan.

52. In North-East Asia and Central Asia, through the Subregional Programme for Environmental Cooperation, the secretariat supported implementation of actions addressing air pollution, desertification and land degradation, and promoting ecosystem conservation, marine protected areas and low carbon cities. The Programme strengthened the science-based, policy-oriented cooperation on transboundary and emerging environmental issues engaging wider stakeholders.

53. To promote evidence-based decision-making on natural resources management, the secretariat provides continuous training and capacity-building on environment statistics, notably through the System of Environmental-Economic Accounting with noticeable success in the small island developing States in partnership with the Secretariat of the Pacific Regional Environment Programme.

54. Addressing shared vulnerabilities and the transboundary nature of disaster risks through early warning in the region is the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries, which has contributed to establishing the Regional Integrated Multi-Hazard Early Warning System for Africa and

Asia.²⁷ Through regional coordination, the Trust Fund reduced the total cost of establishing and maintaining early warning systems, especially in countries with elevated disaster risks. Capitalizing on new innovations in frontier technology for multi-hazard risk assessment, the secretariat is facilitating development of second-generation early warning products such as impact-based forecasting and risk-informed early warning to build countries' climate resilience.

55. Building on the above efforts, the region has an opportunity to realize environmental co-benefits and deepen partnerships to mainstream environmental solutions. By leveraging cooperation, the region can scale up efforts to increase resource efficiency, promote circular economy approaches, implement nature-based solutions for ecosystems conservation and restoration and strengthen climate action, resulting in more sustainable management of finite natural resources, restored and rehabilitated valuable ecosystems and effective delivery of climate targets.

B. Utilizing the means of implementation of the 2030 Agenda for Sustainable Development to promote environmental action

Partnerships

56. Given the multiple actors involved in the management of natural resources and ecosystems as well as in areas such as sustainable urban development and climate action, multi-stakeholder partnerships will be pivotal for achieving environment-related Sustainable Development Goals and targets. The ESCAP *Guidelines for Multi-stakeholder Partnerships to Implement the 2030 Agenda in Asia and the Pacific*²⁸ have highlighted how partnerships can provide multi-actor and integrated solutions required by the scope and nature of the Sustainable Development Goals; can create value for the organizations, communities and individuals involved; can maximize representation, democratic processes and responsibilities; and can promote a broader operationalization of public goods through open decision-making processes. The Commission's work has also identified certain elements that can help ensure a successful partnership: strong social capital, ownership and commitment; and collaborative decision-making processes.

Promoting integration and policy coherence

57. The ESCAP Environment and Development Division promotes the development of integrated environmental policies that take into account the potential interlinkages and trade-offs between different sectors of the environmental but also other development aspects. For example, any water-related policy would need to take into account the synergies and trade-offs with the energy and food sectors as well as with climate change and disaster risk reduction strategies.

²⁷ The Regional Integrated Multi-hazard Early Warning System for Africa and Asia is an intergovernmental institution that provides cost-effective access to multi-hazard early warning systems, products and services.

²⁸ United Nations University Institute for the Advanced Study of Sustainability and ESCAP, *Partnering for Sustainable Development. Guidelines for Multi-stakeholder Partnerships to Implement the 2030 Agenda in Asia and the Pacific* (Tokyo and Bangkok, 2018).

58. To this effect, the Division has developed a new methodology for integrated approaches for planning for the Sustainable Development Goals, focusing on Sustainable Development Goal 6 on water and sanitation.²⁹ The publication highlights how a systems thinking approach can be used to develop strategies and plans for the integrated and holistic implementation of the 2030 Agenda, focusing on the example of Sustainable Development Goal 6 on water and sanitation and its linkages and relationship with the other Sustainable Development Goals. The comprehensive methodology assists policymakers in: (a) reviewing existing institutional architecture and mandates to determine their relationship with the 17 Sustainable Development Goals; (b) assessing the impacts of policies and identifying effective policy interventions (leverage points) for impactful investment and use of scarce resources; and (c) stakeholder mapping and engagement in collectively developing the aspirational qualitative vision for societal change. Pilot projects to apply this methodology and support the implementation of the Sustainable Development Goals have been undertaken in Fiji, Sri Lanka and Tajikistan.

59. With regard to promoting policy coherence for climate action, the key focus area for ESCAP has been on harmonizing the Sendai Framework for Disaster Risk Reduction and Sustainable Development Goal 13 on climate action. The newly established Asia-Pacific Disaster Resilience Network, supported by a regional hub of knowledge and innovation as well as multi-hazard early warning system platform, serves as an institutional mechanism to sustain the momentum of policy coherence. ESCAP issues reports in specific thematic areas related to climate resilience. For example, the report entitled *Sand and Dust Storms in Asia and the Pacific*, issued in 2018, provides evidence on how climate change is inducing deep uncertainties in the frequency and characteristics of hazards, which makes traditional risk analysis insufficient. Future research will focus on developing new methods of dynamic risk analysis to address these deep uncertainties, resilient infrastructure and frontier technology applications, whilst ensuring peoples' empowerment, inclusiveness and equality.

Data, statistics and assessments for Sustainable Development Goal 14

60. To support countries with tracking progress towards Sustainable Development Goal 14 and its targets, ESCAP proposes supporting existing national processes through “ocean accounts partnerships” that will include assessing the needs of countries for implementing Sustainable Development Goal 14 and other national priorities, implementation of the tool to accelerate achievement of Sustainable Development Goal 14 and establishing a national ocean accounts platform that integrates existing statistics conceptually and spatially in line with Sustainable Development Goal 14-related national priorities.

61. ESCAP is also developing a methodology to expedite the implementation rate of Sustainable Development Goal 14. The methodology supports the understanding of possible trade-offs as well as synergistic relations between Sustainable Development Goal 14 and other Sustainable Development Goals to position effective policies for the ocean to create further co-benefits and prosperity for people and the planet.

²⁹ ESCAP, *Integrated Approaches for Sustainable Development Goals Planning: The Case of Goal 6 on Water and Sanitation* (ST/ESCAP/2778).

Financing the environment-related Sustainable Development Goals

62. Many opportunities exist for revisiting the current economic development incentives at the national and subnational levels, including at municipality levels, to support sustainable use of natural resources and to steer economic growth towards environmentally sustainable and socially inclusive pathways. The following are a few specific examples of ESCAP activities that support member States on financing for the environment in the areas of water, sustainable urban development and climate action.

63. ESCAP has produced analytical work to support the promotion of policies for financing water-related Sustainable Development Goals. A recently published working paper³⁰ identifies specific policy measures that can enable the financing of water-related Sustainable Development Goals through increasing the cost recovery of water service providers and engaging with commercial lenders and the private sector. This will assist in implementing impact investment approaches from public and private sources; correcting/enhancing the sustainable business model of water service providers; and selecting financial instruments and arrangements that are aligned with environmental objectives and that use ecosystem-based approaches.

64. The Commission issued a document at its seventy-fourth session on innovations in municipal financing (ESCAP/74/12). The document draws on experience from developed and developing countries in raising private debt and equity for financing urban infrastructure and identifies appropriate policy actions for a typology of financing situations in the Asia-Pacific region.

65. ESCAP showed that the total infrastructure investment needed for the region is estimated to reach \$22.6 trillion over 15 years (from 2016 to 2030) in a baseline scenario, and the annual financing gap is estimated at \$226 billion. The analysis for selected Asia-Pacific countries over a five-year period from 2016 to 2020 shows that public sector reforms on tax revenues and expenditures can meet approximately 46 per cent of the annual financing gap (\$121 billion out of \$262 billion) for investments based on baseline estimates. The result is a 54 per cent gap (or \$141 billion) specifically for private sector infrastructure finance instruments, including debt capital, public-private partnerships and land value capture mechanisms.³¹

66. As a follow-up to this work, ESCAP has launched a new partnership with the Asian Development Bank to support local governments and member States in the region to identify and implement practical solutions for localizing finance. One of the key knowledge outcomes from this partnership will be a dedicated focus on this issue as part of a major joint publication entitled “The future of Asia-Pacific cities report”, which will be launched at the seventh Asia-Pacific Urban Forum in mid-2019.

67. Focusing on finance for climate action, ESCAP is assisting four countries – Indonesia, Pakistan, the Philippines and Sri Lanka – with developing innovative financial instruments to empower their central banks in promoting investments in low-carbon climate-resilient development through climate mitigation and adaptation projects. Scoping studies have been developed for the four target countries as well as case studies. Two rounds of

³⁰ ESCAP, *Enabling Policies for Financing Water-related Sustainable Development Goals* (ST/ESCAP/2839).

³¹ See ESCAP/74/12.

national consultations on the scoping studies and to establish national networks were held. A regional seminar on the peer learning and exchange of experiences was held in June 2017. All knowledge products are shared online under the climate action thematic area of the Sustainable Development Goal helpdesk for regional knowledge-sharing (<https://sdghelpdesk.unescap.org>).

VII. Matters for consideration by the Committee at its fifth session

68. The present document presents a set of solutions that could be used to harness the benefits of environmental action for the economy, society and the planet, and highlights the catalytic factor that regional cooperation and the means of implementation of the 2030 Agenda could have in implementing these solutions. In the context of the above, the Committee may wish to provide strategic guidance to the secretariat:

(a) With regard to strengthening the means of implementation for environmental action;

(b) On further enhancing regional collaboration through environmental initiatives that generate benefits for the people of the Asia-Pacific region.
