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Environment and development in the aftermath of the coronavirus disease pandemic in the Asia-Pacific region

Environmental challenges related to the coronavirus disease pandemic in the Asia-Pacific region

Note by the secretariat

Summary

The present document contains a brief introduction to the coronavirus disease pandemic and its impacts in Asia and the Pacific as well as a description of how an approach focused on planetary health can help to frame the causes of and policy responses to the pandemic. It also contains a discussion of the drivers of zoonosis and the environmental impacts of the pandemic through the lens of the four key areas of work in environment and development of the Economic and Social Commission for Asia and the Pacific. It also includes case studies and policy responses with regard to the application of a planetary health approach in developing strategies for a greener, more inclusive and resilient recovery from the pandemic at the national level and opportunities for regional collaboration in that regard.

The Committee on Environment and Development may wish to consider identifying ways to use the planetary health approach as a guide for national strategies to build back better following the pandemic, opportunities to promote the approach at the regional level, and activities and programmes to be implemented by the secretariat in support of a green recovery.

* ESCAP/CED/2020/L.1.

I. Coronavirus disease, its causes and how a planetary health approach can support recovery from and mitigation against future zoonoses

1. The coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is a highly contagious respiratory virus, has the world's full attention. In response to the pandemic, countries across the region have gone into lockdown, driving economies into recession, with losses expected to range from $1.7 trillion to $2.5 trillion in Asia and the Pacific alone.[1] The pandemic has disproportionately affected vulnerable populations, including migrants, informal workers and the poor, who are unable to access resources, health care and social protection, thereby deepening poverty and inequality. An estimated 90 per cent of global COVID-19 cases have been reported in urban areas,[2] which in Asia and the Pacific account for more than 80 per cent of the region's gross domestic product. It is projected that ultimately, more people could die from hunger linked to the pandemic than from the disease itself.[3]

2. Environmental, animal and human health are closely linked: environmental hazards are linked to more than 80 per cent of the communicable and non-communicable diseases worldwide.[4]

3. Evidence strongly suggests that SARS-CoV-2 has a zoonotic source.[5] A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Animals thus play an essential role in the existence and spread of zoonotic infections. Zoonoses may be bacterial, viral or parasitic, or may involve unconventional agents. As well as being a public health problem, many of the major zoonotic diseases have a negative impact on the efficient production of foods of animal origin and create obstacles that affect international trade in animal products.

4. Disease spillover from animals to humans is on the rise worldwide, largely as a consequence of the changing relationship between humans and nature. Approximately two thirds of known human infectious diseases are zoonotic. Crossing the species barrier generally occurs when a host passes a virus to an intermediate viral host, which in turn passes it to humans. In general, the emergence of zoonotic diseases can be attributed to factors that increase the interface and rate of contact between humans, domestic animals and wildlife, thereby creating increased opportunities for zoonotic spillover events to occur.

5. The specific drivers and compounders of zoonosis are presented in detail in section II. They largely stem from the severe and rapid degradation and fragmentation of ecosystems caused by human's changes in land use.

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[1] Secretariat of the Convention on Biological Diversity, "Building back better: a way forward from COVID-19", 17 April 2020.

[2] United Nations, "Policy brief: COVID-19 in an urban world" (New York, 2020).

[3] Oxfam International, "The hunger virus: how COVID-19 is fuelling hunger in a hungry world", 9 July 2020.

[4] United Nations Development Programme (UNDP), "Planetary health". Available at www.undp.org/content/undp/en/home/2030-agenda-for-sustainable-development/people/health/planetary-health.html (accessed on 6 July 2020).

[5] World Health Organization, "Coronavirus disease 2019 (COVID-19): situation report – 94", 23 April 2020.

6. The present document will serve to address two key questions: (a) what approaches can help to frame an understanding of the drivers of zoonosis; and (b) what can be done to address the drivers in a way that limits current and future risks to human health.

7. One way to frame the understanding of the drivers of zoonosis and the actions that can address them is the concept of planetary health. According to *The Lancet* and the Rockefeller Foundation, planetary health is defined as the achievement of the highest attainable standard of health, well-being and equity worldwide through judicious attention to the political, economic and social human systems that shape the future of humanity and to the Earth's natural systems that define the safe environmental limits within which humanity can flourish. Put simply, planetary health is the health of human civilization and the state of the natural systems on which it depends.[6]

8. The concept of planetary health is increasingly being used to frame analytical work and responses to the pandemic. Reference had been made to planetary health within the United Nations system even before the emergence of COVID-19, with global calls for a more holistic view of health to be adopted, which includes the concept of planetary health. In an early article on the response to the pandemic, published in *The New York Times* in April 2020, the Secretary-General wrote that scientific research indicated that the world was approaching a point of no return for human health, which was dependent on planetary health, and that human conduct was leading to severe biodiversity loss, changing animal-human interaction and distorting ecosystem processes that regulated planetary health and controlled many services that humans depended on. More than two years before the emergence of COVID-19, the Conference of the Parties to the United Nations Framework Convention on Climate Change at its twenty-third session gave proper attention to the concept of planetary health by holding a high-level planetary health event on 13 November 2017. At the event, the Executive Secretary of the United Nations Framework Convention on Climate Change called for a more holistic view of health worldwide that would include the concept of planetary health. The World Health Organization has also incorporated the concept of planetary health in capacity-building tools and courses.

9. References to the concept of planetary health are also increasingly appearing in intergovernmental dialogues, including in supporting documents and statements by representatives of member countries and organizations. The editions of the *Sustainable Development Goals Report* prepared in 2018, 2019 and 2020 in support of the annual high-level political forum on sustainable development include explicit references to the links between specific Sustainable Development Goals and planetary health. For example, according to the 2020 edition, consumption and production drive the global economy but also wreak havoc on planetary health through the unsustainable use of natural resources. In its statement to the Economic and Social Council during its integration segment, held on 6 July 2020, the Alliance of Small Island States said that planetary health and human health were inexorably conjoined, warning that humanity would not survive if all the Earth systems were to collapse under the weight of human misuse and unabated climate change.

[6] Sarah Whitmee and others, "Safeguarding human health in the Anthropocene epoch: report of the Rockefeller Foundation – Lancet Commission on planetary health", *The Lancet*, vol. 386, No. 10007 (November 2015).

10. The concept of planetary health provides a framework for the development, implementation and assessment of ambitious, integrated policies that address the linkages between the health of the natural world and human health within the safe environmental limits defined by Earth's natural systems, in alignment with the 2030 Agenda for Sustainable Development. More specifically, the planetary health approach promotes transformative innovations, biologically inspired design, living systems thinking and a holistic approach to health and resilience.

11. The planetary health approach is considered in the present document through the lens of four key areas: (a) raising climate ambition; (b) safeguarding ecosystem health; (c) clean air for all; and (d) cities for a sustainable future. Given the links between the environment and human health, integrated action in these areas can mitigate the risk of zoonosis.

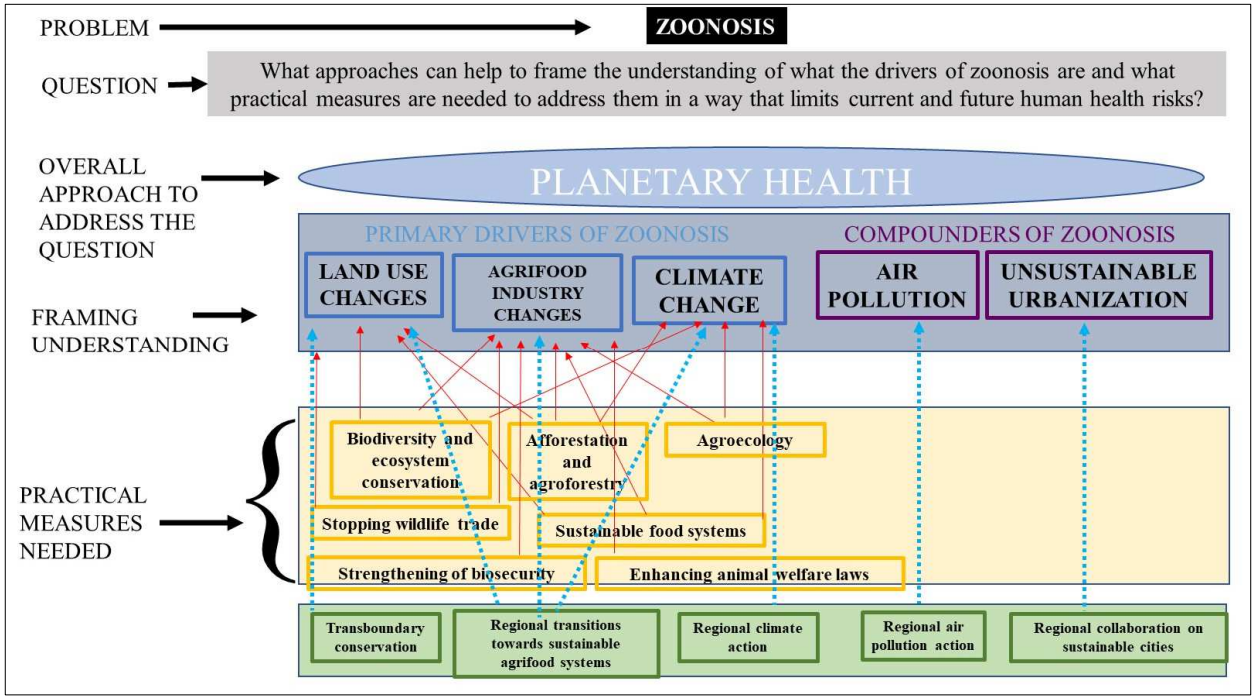
12. Air pollution in the region is a human health risk in itself that also compounds the impacts of respiratory disease. Actions taken to improve air quality will directly benefit human health and can also reduce the risks to planetary health.[7]

13. Owing to their population size and high level of global and local interconnectivity, cities are particularly vulnerable to the spread of viruses. While urban density does not per se correlate to higher virus transmission, some factors that can be associated with density do, such as overcrowding, low incomes and lack of services. Promoting more sustainable cities by upgrading green spaces and urban wet markets and improving water, sanitation and hygiene infrastructure and medical services would help to mitigate zoonoses. Access to adequate housing especially for slum dwellers would have had a direct impact on the ability to implement control measures and to treat all residents. In the longer term, it is important to recognize that compact cities are better for the health of the planet and people, particularly when designed to ensure adequate housing, basic services and public green space for all.

14. Figure I shows the conceptual framework for the present document, which serves to highlight environmental drivers of zoonosis and proposed solutions, aligned with the planetary health approach, to guide national, sectoral and regional efforts to recovery from the COVID-19 pandemic, through the lens of the four key areas of work in environment and development of the Economic and Social Commission for Asia and the Pacific (ESCAP). The figure also shows that in living, complex systems, there are interlinkages among the various drivers and compounders of zoonosis and among solutions to achieve planetary health.

[7] Philip J. Landrigan and Richard Fuller, "The impact of pollution on planetary health: emergence of an underappreciated risk factor", *Perspectives,* No. 29 (Nairobi, United Nations Environment Programme, 2018).

Figure I
Conceptual framework for mitigating the risks of zoonosis in alignment with the planetary health approach

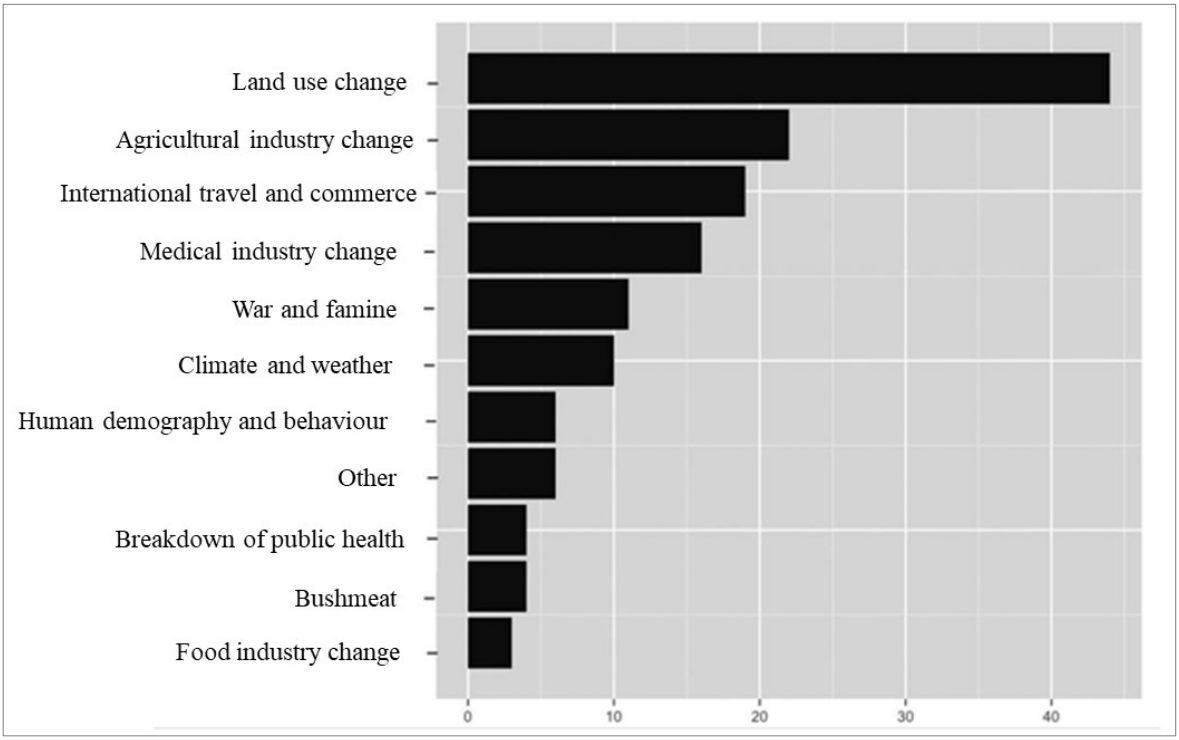


II. Drivers and compounders of zoonosis and environmental linkages

A. Environmental drivers of zoonosis

15. Environmental drivers of zoonosis and the scale of the resulting disruption can be linked primarily to environmental degradation and globalization (figure I). An increase in zoonotic spillover events over the past 60 years is tied to ecological deterioration and the increased settlement of previously wild areas, which has increased the human-wildlife interface. The number of emerging infectious disease events between 1940 and 2004 and their primary drivers are shown in figure II. Globalization has facilitated global viral transmission at an unprecedented rate (see table).

Figure II
Number of emerging infectious disease events between 1940 and 2004, by primary driver of disease



Source: Elizabeth H. Loh and others, "Targeting transmission pathways for emerging zoonotic disease surveillance and control", *Vector Borne and Zoonotic Diseases*, vol. 15, No. 7 (July 2015).

1. Land use changes

16. Specific aspects of land use changes drive zoonosis, affecting ecosystems' health and biodiversity. Between 2000 and 2015, a net total of approximately 135,000 km^2 of natural forest area (calculated as forest area minus planted forest) was lost in the region. The area lost is approximately three times the size of Denmark and accounts for 10.6 per cent of the world's total natural forest loss (see table). Of the region's 723 million hectares of forest, primary forest accounts for only 19 per cent (140 million hectares), which is much lower than the global average of 32 per cent.[8] The relatively low figure is largely due to an increase in timber extraction, large-scale biofuel plantations, the growing export market for palm oil and the expansion of intensive agriculture and shrimp farms.[9] As humans build roads and clear forests, forest edges are increasingly a major launch pad for novel human viruses.[10] Habitat fragmentation further proliferates the number of forest edges,

[8] Food and Agriculture Organization of the United Nations (FAO), *Forest Futures: Sustainable Pathways for Forests, Landscapes and People in the Asia-Pacific Region* (Bangkok, 2019).

[9] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *Summary for Policymakers of the IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Asia and the Pacific* (Bonn, Germany, 2018).

[10] Andrew P. Dobson and others, "Ecology and economics for pandemic prevention", *Science*, vol. 369, No. 6502 (July 2020), pp. 379–381.

exposing small wildlife clusters to domesticated animals. The proliferation of forest edges also increases the likelihood that livestock will interact with wildlife, heightening the risk of disease.

17. The continuing loss of biodiversity on a global scale poses direct and indirect threats to health and well-being. Ecosystem services include disease prevention. Changes in biodiversity affect ecosystem structures and functions, often posing threats to key ecosystem services and health. Nature, with its diversity of microorganisms, flora and fauna, is an important source of medicine and antibiotics. Biodiversity loss thus limits the discovery of potential treatments for many diseases and health problems. Biodiversity loss also impacts exposure to vector-borne disease, albeit in ways that are inadequately understood.[11] Biodiversity loss is a serious threat in the Asia-Pacific region, which currently has 12,523 threatened species, the highest number of threatened species in the world (see table). The increasing demand for wildlife products fuels the unsustainable trade in many endemic rare species. Meanwhile, unregulated coastal development and overexploitation of marine resources, which are already harmful, are compounded by marine pollution, ocean acidification and climate change; all of these factors combined aggravate the risk of biodiversity loss by creating added strain on fragile coral reefs, the most biodiverse ecosystem on Earth.

2. Agricultural and food industry changes

18. Unsustainable food systems, agricultural expansion and the international trade in live animals and food, which are on the rise, are key drivers of zoonosis.

19. Resource-intensive, industrial monoculture farming and urban sprawl extending into hinterlands cause severe damage to the natural environment, driving changes in land use and, as a result, reducing the habitat of wildlife and increasing the interface between wildlife and human populations. The increasing demand for food, in particular animal protein, drives the conversion of forests into farmland. Increasing demand for food can lead to production in farms that may not have adequate resources and facilities to prevent and control diseases. This can create additional risks for the emergence of zoonosis.[12] The agricultural sector is the largest user of water worldwide, and 70 per cent of all fresh water consumed by humans goes to crop irrigation.[13] Escalating water scarcity is likely to push wildlife to travel farther for water. It also increases the likelihood that domestic and wild animals will have to share water resources. Selective breeding for specific characteristics can reduce genetic diversity and, by extension, the resilience of the agricultural system to environmental changes including climate change and the increasing risk of disease. A person can contract a pathogen directly from a wild animal or following an outbreak in livestock, in which case the likelihood of pathogen transmission to humans is amplified. Growth in livestock production increases the likelihood of wildlife interacting with domestic animals, which can potentially act as intermediate viral hosts. Food markets where wild animals are sold also contribute to an increased risk of zoonosis owing to poor sanitation of animal holding areas, a lack of protective equipment and high

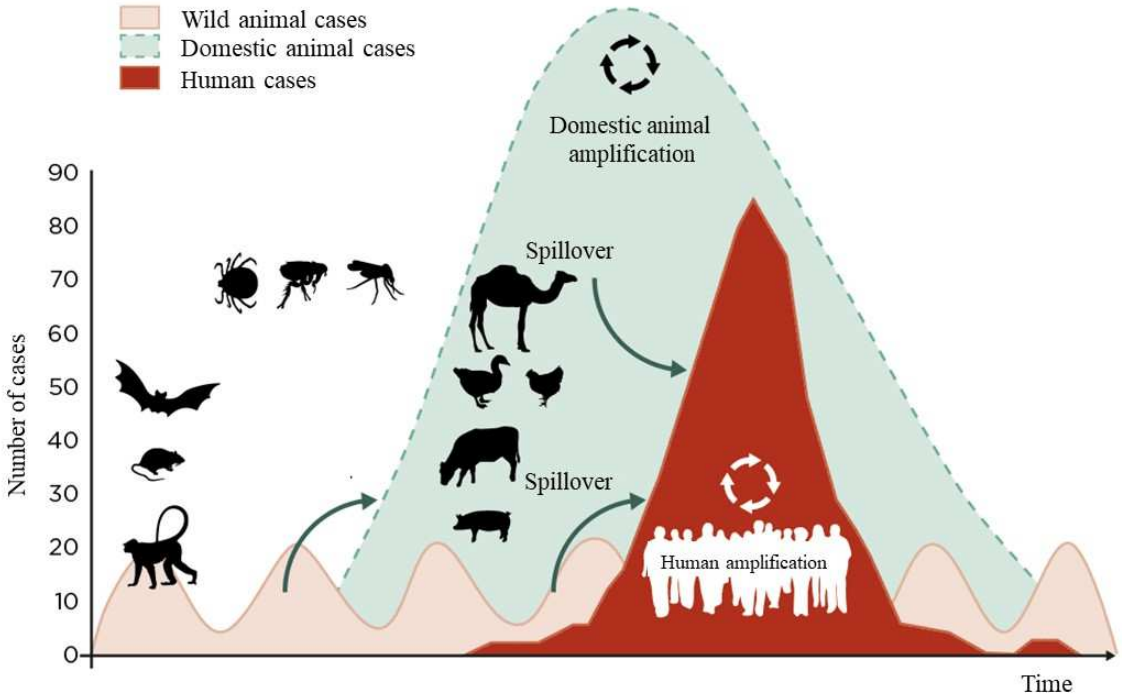
[11] Planetary Health Alliance, “Biodiversity shifts”. Available at www.planetaryhealthalliance.org/biodiversity-shifts (accessed on 6 July 2020).

[12] FAO, *The Future of Food and Agriculture: Trends and Challenges* (Rome, 2017).

[13] UNDP, “Goal 12: Responsible consumption and production”. Available at www.undp.org/content/undp/en/home/sustainable-development-goals/goal-12-responsible-consumption-and-production.html (accessed on 28 August 2020).

stress levels of the animals. At these markets, a large number of people can come into close contact with the animals, thus creating the ideal situation for the emergence of diseases. See figure III.

Figure III
Transmission and amplification of zoonotic diseases



Source: ESCAP calculations based on William B. Karesh and others, "Ecology of zoonoses: natural and unnatural histories", *The Lancet*, vol. 380, No. 9857 (December 2012).

3. International trade in live animals and food

20. Historically, disease outbreaks have been localized to the area of emergence, with dispersion limited by available means of transport. For years, this inaccessibility prevented many common diseases from spreading to isolated and island countries. However, specific environmental aspects of globalization accelerate virus transmission. For example, the food trade has grown, and pressure to adopt intensive and unsustainable agricultural practices has increased. Globalization has also made meat more accessible. In regions where large-scale animal production has not been possible, the market gap created by increased demand is now being filled with imports. During export, live production animals are often kept in unsanitary and overcrowded conditions, and welfare enforcement is poor. Stress in animals is immunocompromising and increases susceptibility to disease, creating the ideal scenario for disease emergence as domesticated production animals often act as intermediate viral hosts. And in the wild animal trade, the animals are typically intended to be used as pets or to produce traditional medicine or exotic decor. The removal of wild animals from their natural habitat not only has negative conservation implications but also poses a high risk for zoonotic spillover. The illegal trade in wildlife is the fourth most lucrative crime globally. Its annual value is estimated at $23 billion, and the market is based predominantly in Asia.

4. Climate

21. Climate change can have an impact on land use change and therefore create more tropical forest edges. It is disrupting ecosystems, as many species are no longer well adapted to their erstwhile niches. Both effects may bring wild animals closer to humans, further heightening the chances of zoonotic outbreaks. For instance, bats are a common vector of disease; their natural habitat includes caves and trees. Owing to climatic changes, bat species are forced to move into increasingly smaller areas or find new semi-natural habitats that may be in close proximity to humans. As the bats interact with their novel ecosystem, animals and humans alike are exposed to new viruses that are dormant in bats but potentially lethal for humans.[14] Additionally, as disease prevalence increases in warm and humid conditions, global warming will exacerbate that trend.

B. Environmental compounders of zoonosis

22. In addition to the above-mentioned primary environmental drivers, a number of environmental compounders can worsen their impact, as in the case of air pollution, or enhance the primary drivers in a transversal manner, as in the case of unsustainable urban development.

1. Air pollution

23. Studies indicate that exposure to air pollution not only makes people more susceptible to SARS-CoV-2, but can delay or complicate the recovery of patients suffering from COVID-19 and lead to more severe and lethal forms of the disease.[15] As the region most affected by air pollution in the world, Asia and the Pacific can benefit from close attention to this issue as a compounder of COVID-19.

2. Unsustainable urbanization

24. More than 50 per cent of the region's population lives in cities. The region's urban population exceeded 2.3 billion in 2019, accounting for 54 per cent of the global urban population. Moreover, it is expected to rise to more than 2.8 billion in 2030 and reach nearly 3.5 billion in 2050, the equivalent of adding four Tokyo-sized cities every year. Urbanization is characterized by the conversion of rural land, increased population density, socioeconomic change and ecological fragmentation, which can have profound impacts on the epidemiology of infectious diseases such as COVID-19. In particular, the expansion of the world's cities and the densely populated urban slums create new ecological niches and risk factors for such diseases.[16] Rapid, inefficient and unplanned urbanization together with unsustainable

[14] Henrik F. Lorentzen and others, "COVID-19 is possibly a consequence of the anthropogenic biodiversity crisis and climate changes", *Danish Medical Journal*, No. 5/2020 (May 2020).

[15] The Conversation, "Air pollution exposure linked to higher COVID-19 cases and deaths: new study", 14 July 2020; and José L. Domingo and Joaquim Rovira, "Effects of air pollutants on the transmission and severity of respiratory viral infections", *Environmental Research*, vol. 187 (August 2020).

[16] Matthew R. Boyce, Rebecca Katz and Claire J. Standley , "Risk factors for infectious diseases in urban environments of sub-Saharan Africa: a systematic review and critical appraisal of evidence", *Medical Geography of Tropical Infections: Disease*, vol. 4, No. 4 (September 2019); and ScienceDaily, "Expansion of world's cities creating 'new ecological niches' for infectious diseases", University of Lincoln, 21 April 2020.

consumption patterns and changes in lifestyles over recent decades have predominantly resulted in environmental degradation; loss of biodiversity; increased pressure on natural resources and land use changes; exposure to air pollution and disasters; and vulnerability to climate change.

Latest data on Asia-Pacific regional trends with regard to environmental drivers and compounders of zoonosis

Drivers and compounders		*Trends*	*Supporting data*
Primary drivers	Land use changes (enhance the interface between wildlife and humans and affect biodiversity)	Continuous deforestation	Between 2000 and 2015, a net total of 135,333 km^2 of natural forest area (calculated as forest area minus planted forest) was lost in the region. The area lost is approximately three times the size of Denmark and accounts for 10.6 per cent of the world's total natural forest loss. Between 1980 and 2000, more than 80 per cent of agricultural expansion in the tropics came at the expense of forests. During that period, nearly 60 per cent of new agricultural land and oil palm plantations in South-East Asia was converted from intact forests, with oil palm plantations being responsible for more than 80 per cent of the expansion in plantation area by the 1990s.[a]
		Continued biodiversity loss	The decline in the International Union for Conservation of Nature and Natural Resources Red List Index from 2000 to 2020 shows an increasing threat of extinction. The greatest decline has occurred in Asia and the Pacific. In 2000, the value of the Red List Index for species survival for vertebrates (mammals, birds and amphibians) in the region was above 0.8 (on a scale from 0.0 to 1.0). In 2020, the Index value was nearing 0.75, the lowest of any region, while the number of threatened species was recorded at 12,523, the highest in the world.[b] Asia and the Pacific is also the region with the lowest value on the global biodiversity intactness index (below 0.7), which is used to estimate how much of the originally present biodiversity remains on average across the terrestrial ecological communities.[c]
	Agricultural and food industry changes	Unsustainable food systems and agricultural expansion on the rise	Over the past 50 years, global agricultural production has nearly doubled, with total area harvested having increased by 32 per cent. Asia increased its share of global agricultural production, from 34 per cent in 1963 to 47 per cent in 2013.[d] Agriculture is the main driver of freshwater withdrawals in Asia. Agriculture accounts for more than 90 per cent of freshwater withdrawals in 13 countries in the region, including 6 in Central Asia. In nearly all countries in the region, pressure on water resources is increasing owing to growing populations and economic development.

Drivers and compounders		*Trends*	*Supporting data*
		International trade in goods and live animals	World trade in goods has increased dramatically over the past decade, with the value of global trade increasing from approximately $10 trillion in 2005 to more than $18.5 trillion in 2014.[e] Globally, live animal exports are valued at approximately $22 billion. Volume has increased from 680 million animals in 1997 to 1.9 billion in 2017, with four of the top global importers located in the Asia-Pacific region.[f]
	Climate	Increasing greenhouse gas emissions leaving the region to face consequences of climate change	The Asia-Pacific region is home to 6 of the top 10 global carbon emitters, contributing to more than half of the world's total greenhouse gas emissions. The region emitted 17.27 billion tons of carbon dioxide in 2019, and China alone produced approximately 28.8 per cent of the world's carbon dioxide emissions from territorial fossil fuels.[g] In 2000, the global average atmospheric carbon dioxide concentration was 369.55 parts per million, compared to 408.52 parts per million in 2018.[h]
Compounders	Air pollution	Worsening air quality	Sulphur dioxide and nitrogen oxide emissions have declined, but ambient concentrations of ozone and fine particles (including short-lived climate pollutants such as black carbon) have continued to increase.[i] Transboundary smoke haze pollution is becoming the key regional air quality problem in South-East Asia. Ninety-two per cent of people in the region are exposed to a level of air pollution that poses significant health risks.[j] In China, rapid development in the 1990s and 2000s, at which time the country's energy matrix was heavily dependent on unrefined coal for fuel, demonstrated the relationship between the expansion of energy-intensive manufacturing sectors and emissions of harmful air pollutants, such as dust, sulphur dioxide, nitrogen oxide and acid rain.[k] As private vehicle use increases and the practice of burning low-quality (sulphurous) coal to meet domestic and industrial energy demands continues, harmful photochemical smog resulting from car pollutants, consisting of hydrocarbons and nitrogen oxides interacting in the presence of sunlight, is now common in many Asian cities.

Drivers and compounders	*Trends*	*Supporting data*
	Unsustainable urbanization	Surging populations in cities	Between 1980 and 2010, the region's urban population grew by more than 1 billion. In 2017, it exceeded 2.3 billion, accounting for 54 per cent of the global urban population, with the highest urban growth being experienced in intermediary cities. In 2019, more people lived in urban areas than rural areas. The region's urban population is expected to rise to more than 2.8 billion in 2030 and reach nearly 3.5 billion in 2050.[l] The drivers of such growth are changing. While rural-to-urban migration was a key measure of growth between 1980 and 2000, now it has largely peaked, with land reclassification and natural growth contributing equally to urbanization.

[a] Holly K. Gibbs and others, "Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s", *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, vol. 107, No. 38 (September 2010).

[b] International Union for Conservation of Nature and Natural Resources Red List Index. Available at www.iucnredlist.org/search/stats (accessed on 1 September 2020).

[c] World Wide Fund for Nature, *Living Planet Report 2020: Bending the Curve of Biodiversity Loss* (Gland, Switzerland, 2020).

[d] Rabobank/RaboResearch, "Asia-Pacific: agricultural perspectives – economic report" (Utrecht, Netherlands, 2016).

[e] *Key Statistics and Trends in International Trade 2018* (United Nations publication, Sales No. E.19.II.D.5).

[f] See Australian Livestock Exporters Council, "Economic impact of live exports". Available at https://auslivestockexport.com/about-alec/economic-impact# (accessed on 1 September, 2020).

[g] Statista, World carbon dioxide emissions by region 2009–2019. Available at www.statista.com/statistics/205966/world-carbon-dioxide-emissions-by-region/#statisticContainer (accessed on 8 September 2020).

[h] Our World in Data, Atmospheric CO2 concentration, 1629. Available at https://ourworldindata.org/grapher/co2-concentration-long-term?time=1629.2018 (accessed on 7 September 2020).

[i] Intergovernmental Panel on Climate Change (IPCC), *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems* (Geneva, 2019).

[j] Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants and United Nations Environment Programme, *Air Pollution in Asia and the Pacific: Science-based Solutions* (Bangkok, 2019).

[k] He-Zhong Tian and others, "Recent trends of energy consumption and air pollution in China", *Journal of Energy Engineering*, vol. 133, No. 1 (March 2007).

[l] *The Future of Asian and Pacific Cities: Transformative Pathways towards Sustainable Urban Development* (United Nations publication, Sales No. E.20.II.F.1).

25. It is important to understand and act on the drivers and compounders of zoonosis, as they are critical to addressing the root cause of the COVID-19 outbreak and mitigating future spillover events. An examination of these factors can also guide policymakers in understanding the exact dynamics between ecological deterioration and human disease prevalence and, by extension, the practical aspects of the planetary health approach.

III. Environmental impacts of recovery strategies following the coronavirus disease pandemic

26. The COVID-19 pandemic is an opportunity to re-evaluate and reorient development approaches and promote recovery strategies aligned with planetary health. It is a chance to build back better, with a focus on environmental protection, resilience, inclusiveness and sustainability, and guided by the 2030 Agenda. Such a focus is urgently needed. At the global level, the year 2020 was supposed to be a "super year" for the environment, in which three critical international meetings were scheduled with the aim of producing a strong global treaty on biodiversity, a long-awaited high seas agreement and a climate convention that was to hold parties to account and raise climate ambition globally. With the outbreak of COVID-19 and the ensuing crisis, the year 2020 did not yield any of those strong, long-awaited environmental commitments.

27. Despite the disappointments with regard to global environmental negotiations, some argue that much of the work helping to underpin the decision-making process has already been done. Moreover, the environment has enjoyed temporary relief from overexploitation and pollution owing to widespread lockdowns and reductions in human activity and energy use. The steep decline in economic activity has led to other reductions, including in the levels of manufacturing, energy use and transport, and has had largely positive effects on emissions and pollution. Demand for oil and gas has fallen. Studies show that by early April 2020, global carbon dioxide emissions had fallen by 17 per cent as a result of reduced surface transport.[17] Carbon dioxide emissions have declined the most in countries in which COVID-19 struck early. The International Energy Agency estimates that overall, global carbon dioxide emissions will decline by 8 per cent over the course of 2020 to reach their lowest level since 2010.

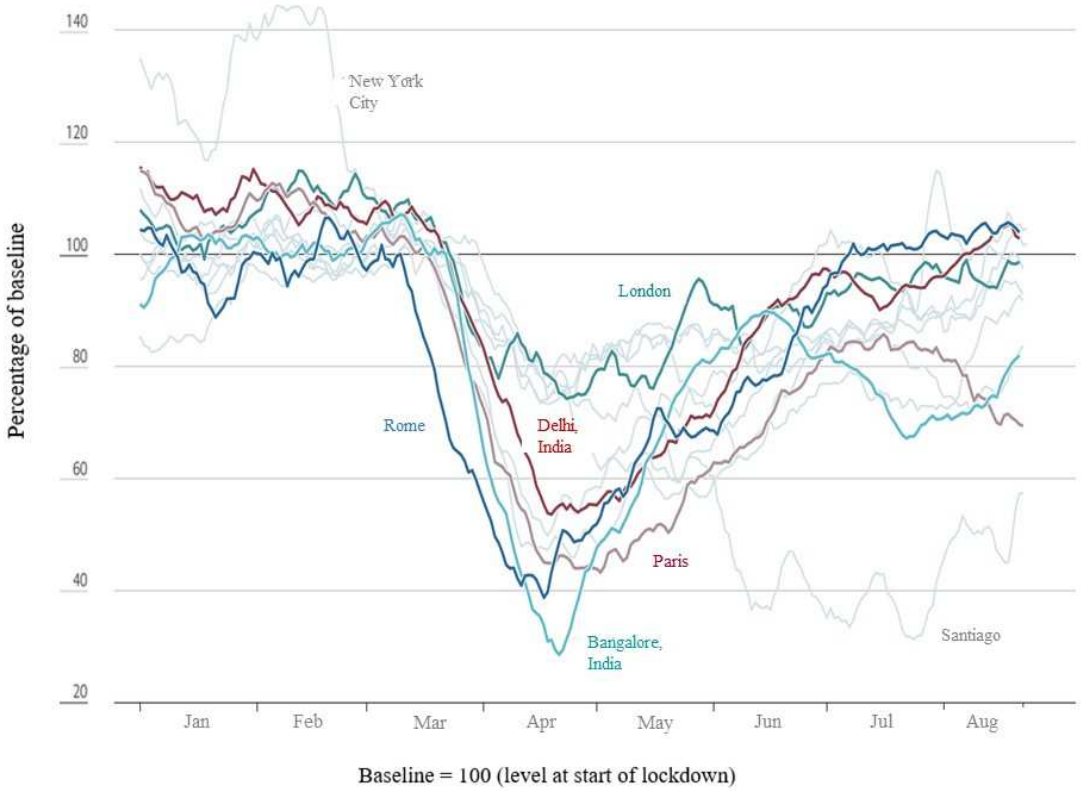
28. In Asia and the Pacific, reductions in energy use, transport and manufacturing have resulted in temporary tangible improvements, namely reduced air pollution as observed by satellite imaging. In China, the Air Quality Index showed that within weeks of the first lockdowns, air quality had improved significantly (by 9.84 points, with PM2.5 down by 14.07 micrograms per cubic metre).[18] Two months of reduced air pollution may have saved the lives of 4,000 children under 5 years of age and 73,000 adults over the age of 70 in China alone. In India, a 15 per cent reduction in nitrogen dioxide concentration levels was recorded around the time of the lockdown (from 15 March to 30 April 2020) as compared to 2019 levels, owing in large part to a considerable reduction in vehicular traffic, which is one of the main sources of nitrogen dioxide emissions. Sulphur dioxide levels for the months of February, March and April also fell compared

[17] Corinne Le Quéré and others, "Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement", *Nature Climate Change*, vol. 10, No. 7 (July 2020).

[18] Guojun He, Yuhan Pan and Takanao Tanaka, "The short-term impacts of COVID-19 lockdown on urban air pollution in China", *Nature Sustainability* (July 2020).

to 2019 levels, likely the result of the reduction in power production.[19] However, these trends have not been even across the region, and levels have since rebounded substantially (see figure IV).

Figure IV
Levels of nitrogen dioxide pollution in 12 cities that locked down in March 2020, 30-day moving average



Source: Economist, "Air Pollution is returning to pre-covid levels", 5 September 2020. Available at www.economist.com/graphic-detail/2020/09/05/air-pollution-is-returning-to-pre-covid-levels.

Notes: The level of nitrogen dioxide pollution at the start of lockdown in each city has been assigned a baseline value of 100, and previous and subsequent levels are shown as a percentage of the baseline value. Pollution levels have been adjusted for weather conditions.

29. Anecdotal evidence of turtles returning to deserted beaches to lay eggs in India and deer walking the streets of Japan provided a glimpse of nature's robustness. However, these positive trends have proved short-lived, subsiding as cities have begun to reopen.

30. Another positive effect of the COVID-19 crisis has been the international spotlight that it has shed on wet markets and the illegal wildlife trade, acting as a call to address the relationship between nature and human health. In that regard, in China, the Standing Committee of the National

[19] Urvashi and others, "In India, air quality has been improving despite the COVID-19 lockdown", World Bank, 4 August 2020.

People's Congress has announced a ban on the consumption of wildlife for food and the related trade as a direct step towards preventing future zoonoses.

31. However, in most cases, the short-term focus on supporting local and national economies has come at the expense of the environment as environmental rules and regulations and their enforcement have been relaxed and financial resources designated for environmental protection have been reallocated. Furthermore, some of the economic and social impacts of the pandemic have led to behaviours affecting the waste and food consumption sectors, among others, with associated negative environmental impacts.

32. Waivers, exemptions and relaxations of standard procedures for mining activities have been granted during the lockdown period, despite their negative environmental impacts (for example land use change from wild/forested areas to mines, which can cause damage, including erosion, sinkholes, biodiversity loss and soil contamination).

33. Some palm oil producers in South-East Asia plan to continue pursuing their biodiesel blending mandates; as oilseed production in Europe declines, this paves the way for buyers to switch to palm oil.[20] Palm oil production is known to lead to deforestation and degradation of habitats, including those of endangered species such as orangutans, and is occurring at an unsustainable and destructive scale.

34. Much-needed resources for climate change mitigation and biodiversity protection have been lost in 2020 as funding has been redirected towards equally important health care and public goods and services to combat the pandemic. The Asian Development Bank has estimated that COVID-19 will cost the global economy trillions of dollars. The World Bank has estimated that prevention (ecological restoration and epidemic preparedness) would cost, on average, $1.69 per capita annually. Investment in prevention is likely to save lives as well as safeguard the environment.

35. National parks are threatened by the lack of funding that usually comes from visitation, hampering rangers' ability to survey parks and sparking fears of a surge in wildlife poaching, illegal fishing and illegal logging as a result. With tourism at an unprecedent low, ecotourism facilities are under pressure to sustain conservation initiatives and feed captive endangered species without their regular revenue.

36. The COVID-19 pandemic has led to the abrupt collapse of waste management chains. Mismanagement is leading to increased environmental pollution as traditional recycling protocols are not followed and waste ends up in landfills. The increased production of face masks, gloves and single-use items as well as infectious waste, all of which must eventually be disposed of, presents a challenge for sustainability and the circular economy and could pose contagion risks if not disposed of appropriately.

[20] Anuradha Raghu and Eko Listiyorini, "Palm oil set for better fortunes after pandemic wrecked bull run", BloombergQuint, 1 July 2020.

37. The pandemic has led to an increase in the use of plastic. In Thailand, the average amount of plastic waste increased from 2,120 tons per day in 2019 to approximately 3,440 tons per day from January to April 2020. The increase in the month of April alone was nearly 62 per cent.[21]

38. As has been the case with air pollution, a rebound effect from temporary positive environmental trends is to be expected as "normal" activities, (i.e. high energy use from manufacturing) resume. It is likely that emissions will return to previous levels and perhaps even surpass them once the crisis is over, owing to the need to restock missing supplies and the likelihood that emissions trends will hew to economic recovery trends. Changes to supply chain logistics could have repercussions for the geography of trade but will not necessarily result in reduced volumes of goods or people being transported. In the previous health crises linked to severe acute respiratory syndrome (SARS), the Influenza A (H1N1) virus and the Ebola virus disease, disruptions were followed by a robust rebound in transport.

IV. Planetary health solutions for greener, more equal and resilient pandemic recovery strategies in Asia and the Pacific

A. National strategies

39. There is scope to ensure that longer-term recovery strategies in the wake of COVID-19 promote a greener, more equal and resilient future aligned with the principles of planetary health and sustainable development. To achieve the highest attainable standard of health, well-being and equity worldwide, recovery strategies should focus attention on humanity's political, economic and social systems and the safe environmental limits within which it can flourish. This focus would enable long-term recovery strategies to address the drivers of zoonosis and reduce the risk of future pandemics.

40. A number of environmental measures can support long-term recovery from COVID-19 by mitigating the drivers and compounders of zoonosis and ensuring that the risks of future zoonoses are lowered.

41. **Ensure biodiversity and ecosystem conservation.** Conservation policies should focus on large-scale integrated restoration of degraded ecosystems and enhanced management of protected areas to increase resilience to natural and health disasters. Governments need to create strong national frameworks to embed biodiversity and ecosystem services into the disease prevention, poverty eradication and sustainable development agendas. Nature-based solutions have the potential to lift a billion people out of poverty, create more than 70 million jobs and add $2.3 trillion in productive growth to the global economy while reducing disaster risk and supporting vital biodiversity and ecosystem functions and services such as clean air, clean and plentiful fresh water, pollination services and control of pests and diseases.[22]

[21] Deutsche Welle, "Coronavirus worsens Thailand's plastic waste crisis", EcoWatch, 28 May 2020.

[22] See section 3 of *Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times* (Washington, D.C., New Climate Economy, 2018).

42. **Focus on afforestation and agroforestry.** At an annual global cost of $9.6 billion, direct forest protection payments could achieve a 40 per cent reduction in deforestation in the areas at highest risk for virus spillover, by economically outcompeting deforestation. Multiple programmes focused on payment for ecosystem services demonstrate the effectiveness of direct forest protection payments.[23] Only three member States have mention forestry policies in their nationally determined contributions for COVID-19 recovery and have introduced them as part of their response to the pandemic. In contrast, 31 member States mentioned actions related to land use in their nationally determined contributions but have not yet introduced any such policies as part of their response. Ten member States did not mention forestry in their nationally determined contributions or stimulus packages. There remains a large opportunity to scale up forestry policies in the region.

43. **Stop the wildlife trade.** Following the 2020 announcement by the Standing Committee of the National People's Congress of China of a ban on the consumption of wildlife for food and the related trade, discussions on phasing the industry out are ongoing. The justification of the measure is that the consumption of wildlife and the related trade create risks for disease emergence and that the health and safety regulations associated with wildlife farming are often insufficient. Governments worldwide should follow suit, and regional wildlife enforcement networks should be strengthened to form part of an effective response system on the frontiers of pandemic prevention.

44. **Transition to agroecology**. Agroecology is an example of low-carbon, risk-informed, resilient, regenerative and sustainable agricultural practices, which applies ecological principles to food systems. Thoughtfully applying these principles to food production can help to regenerate farmland and ecosystem functions, mitigate climate change, promote agricultural biodiversity, build resilience and reduce disaster risk, and therefore can mitigate risks of zoonosis. A transition to agroecology should be mainstreamed into agricultural sector policy, planning and investments. Sanitary and phytosanitary standards should also be prioritized in agriculture, which will result in improvements to animal welfare and transportation.

45. **Render the food systems more sustainable**. The localization of food systems can have major benefits with regard to community wealth-building, the retention of high-quality soils, the sustainability of production, and human nutrition. There are several issues associated with the globalization of consumption and production, including issues related to live animal exports and unsustainable farming practices. The pandemic has exposed the fragility of global value chains. An analysis of trade networks for staple food commodities in the Asia-Pacific region between 1986 and 2015 revealed that 73 per cent of the networks showed signs of weakening resilience.[24] The shutdown of the global market presents an opportunity to switch to local, national or regional trade. Intraregional trade has an unharnessed potential to speed up economic recovery from the pandemic. The formation of production networks and value chains to facilitate trade would create jobs and improve livelihoods. To harness the potential of intraregional trade, Governments would need to take action to strengthen transport connectivity and facilitation at the borders to reduce trade costs. Reassessing the value of supplier

[23] Andrew P. Dobson and others, "Ecology and economics for pandemic prevention", *Science*, vol. 369, No. 6502 (July 2020), pp.379–381.

[24] ESCAP, ADB and UNDP, *Transformation towards Sustainable and Resilient Societies in Asia and the Pacific* (Bangkok, 2018).

diversification would create opportunities and increase the flexibility and strength of value chains.

46. **Strengthen biosecurity**. Australia provides a good example of how Governments can strengthen biosecurity. As an island country with unique endemic biota, it is especially vulnerable to invasive pest species. In recognition of the detrimental impacts pests and weeds have on ecosystems, Australia has some of the most stringent biosecurity laws. One approach to dealing with invasive species is the precautionary approach, which involves foresight, preparedness, surveillance, prevention of incursions and early interventions. The success of this approach depends on capacities related to information and research, risk assessment and pathway analysis, community engagement, funding and evaluation.[25] Although these measures cannot control viral outbreaks in humans, such as COVID-19, they can prevent new zoonoses from being introduced into populations that may act as intermediate hosts and eventually spilling over. Biosecurity measures are vital in the crackdown on the illegal wildlife trade.

47. **Enhance animal welfare laws**. Poor sanitation of animal holding facilities and poor welfare standards can cause stress in animals, reducing their immune response and leaving them susceptible to disease. It is likely that COVID-19 could have been avoided had a high standard of animal welfare been maintained at the Wuhan, China, fish markets.[26] Changes in laws should ensure more stringent regulation of animal welfare standards, specifically with regard to live animal exports and other activities known to be problematic. The New Zealand Animal Welfare Strategy can be seen as an example to follow. It includes better planning to prevent animal welfare problems; better animal husbandry science and technology; clear expectations with help for people to comply; and prioritizing animal welfare.

48. **Focus on a green economic recovery.** In addition to sectoral solutions, attention needs to be paid to the role of the environment in overall recovery packages. Poorly designed recovery strategies could contribute to increased socioeconomic inequalities and intensify detrimental effects on the climate, biodiversity and the environment. Government stimulus packages should be aimed at accelerating decarbonization, building energy independence and supporting the implementation of the Paris Agreement. Stimulus investments should be allocated in line with existing national environmental and climate objectives. Recovery plans should at least maintain, if not strengthen, existing environmental standards and policies related to climate change, air and water pollution, biodiversity loss, and other environmental challenges. There is an opportunity to adopt more extensive carbon pricing mechanisms and eliminate fossil fuel subsidies. Tax incentives and smart de-risking investments should support climate efforts and environmentally friendly aims. Renewable energy is outcompeting traditional energy sources in many parts of the world. Economic recovery stimulus packages should include renewable energy as one of the main sectors of focus, as renewable energy can create more jobs per unit of energy delivered than fossil fuels and has lower life cycle costs. To avoid locking in harmful industries and activities, support should not be provided for projects and activities with detrimental impacts (which would effectively rule out subsidies for certain activities such as coal mining and fossil fuel exploration). In its Green New Deal, the Republic of Korea has set a 2050 net

[25] Invasive Species Council, *Environmental Biosecurity: Best Practice – A Guide for Australian Policymakers* (Fairfield, Australia, 2017).

[26] BBC, "Coronavirus: Australia urges G20 action on wildlife wet markets", 23 April 2020.

zero emissions goal, the first in East Asia, and pledged to end coal financing. The Green New Deal includes a ban on new coal-fired plants and a reduction of emissions from existing coal-fired plants. It is a good example of a plan for a green recovery from the COVID-19 pandemic.

B. Opportunities for regional collaboration

49. The pandemic has served as a wake-up call, underscoring the importance of strengthening and accelerating environmental action. The concept of planetary health can be useful in the response to that call, guiding COVID-19 recovery efforts at the regional level. Planetary health can also guide whole-of-government approaches to COVID-19 recovery efforts at all levels and to specific sectoral policies.

50. Multisectoral policy development and implementation are foundational pillars of zoonotic prevention and response. The conceptual framework of planetary health provides an integrated approach for designing programmes, policies, legislation and research. Such an approach calls for joint participation from governments in collaboration with stakeholders involved in diverse areas of focus, including climate change, public health, veterinary medicine, epidemiology, ecology, environmental policy, disaster risk reduction and more. It is critical to establish effective mechanisms for coordination and collaboration among these areas of focus and throughout the region to synergistically tackle the shared risk of pandemics.

51. Furthermore, the exchange of best practices and capacity-building platforms can support policymakers in Asia and the Pacific to embed environmental considerations into COVID-19 recovery packages, including at the local level, which is critical for the achievement of national, regional and global environmental and sustainable development objectives.

52. Regional sectoral recovery policies would have to appropriately address the common drivers and compounders of zoonosis, in alignment with the planetary health approach. With the world not on track to achieve the Sustainable Development Goals by 2030, policies must also be focused on bridging the considerable implementation gap in Asia and the Pacific with regard to biodiversity, sustainable cities and climate action. Thematic environmental cooperation to support a greener and more resilient COVID-19 recovery could include transboundary conservation, a regional transition towards more sustainable agrifood systems, regional climate and air pollution action, and regional collaboration for the promotion of cities.

53. The region's protected area networks[27] have been growing steadily, both in number and in total area protected, since 1990, with some countries at the forefront of the designation of marine reserves. Interest is growing in transboundary conservation, including collaboration to protect areas of high biodiversity value. In particular with regard to migratory species or watersheds, protected area networks should work synergistically, spanning international borders with participation in protection by all countries involved.

54. Banning the consumption of wildlife for food and the related global and regional trade as well as wet markets across the region could be immediate steps towards mitigating and preventing current and future zoonoses.

[27] A protected area network can be defined as a collection of individual protected areas or reserves operating cooperatively and synergistically with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve.

A regional push to support the transition towards agroecology in Asia and the Pacific would prevent future zoonoses and contribute to environmental progress in the region, in line with the principles of planetary health. Enhanced biosecurity, animal welfare laws and more stringent welfare and sanitary standards for production animals and phytosanitary standards are needed. Information and communications technology and related innovations have the potential to prevent and control zoonotic diseases on livestock farms. Strengthening research and development and scaling up their application, including on small farms and through South-South cooperation, could play an important role. Moving from a global to an intraregional food trade and more local food systems would also help to prevent future zoonoses and speed up economic recovery from the pandemic and could have positive economic and social effects.

55. Regional platforms and networks that support raising climate ambition in Asia and the Pacific and the tackling of air pollution as shared risks and responsibilities should be strengthened.

56. Regional collaboration for the promotion of sustainable cities aimed at reducing air pollution, providing more green spaces, promoting nature-based solutions in or near cities and protecting urban biodiversity could provide many benefits for the mitigation of zoonosis. Integrating health and environmental goals into the planning of such cities would reduce costs and environmental impacts and improve health.

V. Issues for consideration by the Committee

57. In view of the challenges and opportunities outlined above, the Committee on Environment and Development may wish to consider taking the following actions:

(a) Identify ways to use the planetary health conceptual framework as a guide for national strategies to build back better for a more equal, resilient and green future, in line with the 2030 Agenda;

(b) Identify opportunities to promote the planetary health approach at the regional level, for example through platforms for regional dialogue on best practices, capacity-building activities and the development of knowledge products;

(c) Identify and provide further guidance on activities and programmes to be implemented by the secretariat in support of a green COVID-19 recovery.