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HEALTHY ENVIRONMENT, HEALTHY PEOPLE

EXECUTIVE SUMMARY

This report was prepared by the United Nations Environment Programme (UNEP), in collaboration with the World Health Organization (WHO), the Convention on Biological Diversity, the Montreal Protocol on Substances that Deplete the Ozone Layer, and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and the Stockholm Convention on Persistent Organic Pollutants. It received contributions from other United Nations agencies and from stakeholders through an e-consultation at www.myunea.org/

Thematic report
Ministerial policy review session
Second session of the United Nations Environment Assembly
of the United Nations Environment Programme
Nairobi, 23–27 May 2016

As of 27th April 2016

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Executive Summary

The 2030 Agenda for Sustainable Development highlights critical links between development, the environment, human well-being and the full enjoyment of a wide range of human rights, including the rights to life, health, food, water and sanitation. This report summarizes for governments, policy makers and stakeholders the evidence of the linkages between environmental quality and human health and well-being,^a but also points to the broader drivers of these linkages, including inequality, unplanned urbanization, migration, unhealthy and wasteful lifestyles, and unsustainable consumption and production patterns.

Progress in a range of environmental sectors has yielded improvements in health outcomes with substantial economic, financial and social gains in the last decades. The world has met the Millennium Development Goal target of halving the proportion of people without access to improved sources of water, five years ahead of schedule. The successful phase-out of nearly 100 ozone-depleting substances means that up to 2 million cases of skin cancer and many millions of eye cataracts may be prevented each year by 2030 thanks to the healing ozone layer.

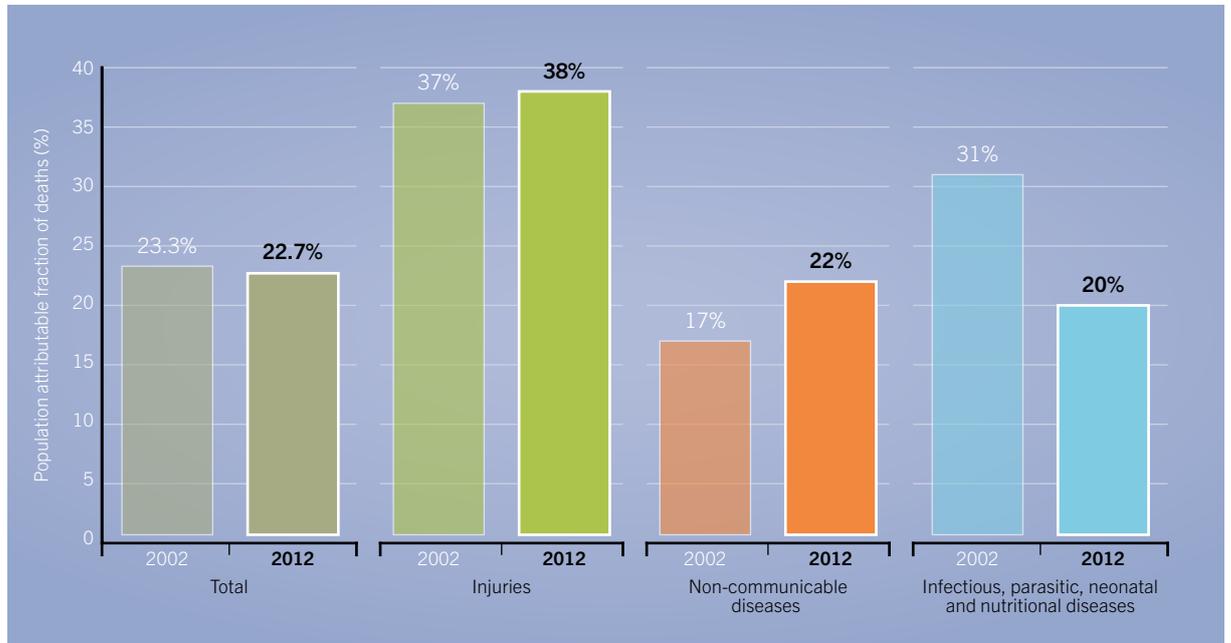
But challenges remain. In 2012, an estimated 12.6 million deaths globally were attributable to the environment. The air we breathe, the food we eat, the water we drink, and the ecosystems which sustain us are estimated to be responsible for 23 per cent of all deaths worldwide. A shift away from infectious, parasitic and nutritional diseases, owing to a higher share of people having access to safe water and sanitation, to non-communicable diseases is evident (figure ES1). The higher prevalence of non-communicable diseases

is attributable to exposure to chemicals, poor air quality and unhealthy lifestyles. While the environmental effects on health represent 23 per cent of deaths globally, the figure increases to 26 per cent for children under 5 years and to 25 per cent for adults between the ages of 50 and 75. The difference in total impacts is 2 percentage points higher for men (22.8 per cent) than women (20.6 per cent), mostly as a result of occupational injuries, the employed percentage of men being globally about 50 per cent higher than that of women.

From a geographical perspective (figure ES2), the highest proportion of deaths attributable to the environment compared to total number of deaths occurs in South-East Asia and in the Western Pacific (respectively 28 per cent and 27 per cent of the total burden). Sub-Saharan Africa (23 per cent of deaths attributable to the environment) is the only region where the burden of infectious, parasitic and nutritional diseases is higher than this of non-communicable diseases, but non-communicable diseases are on the rise, exposing this region to both burdens.

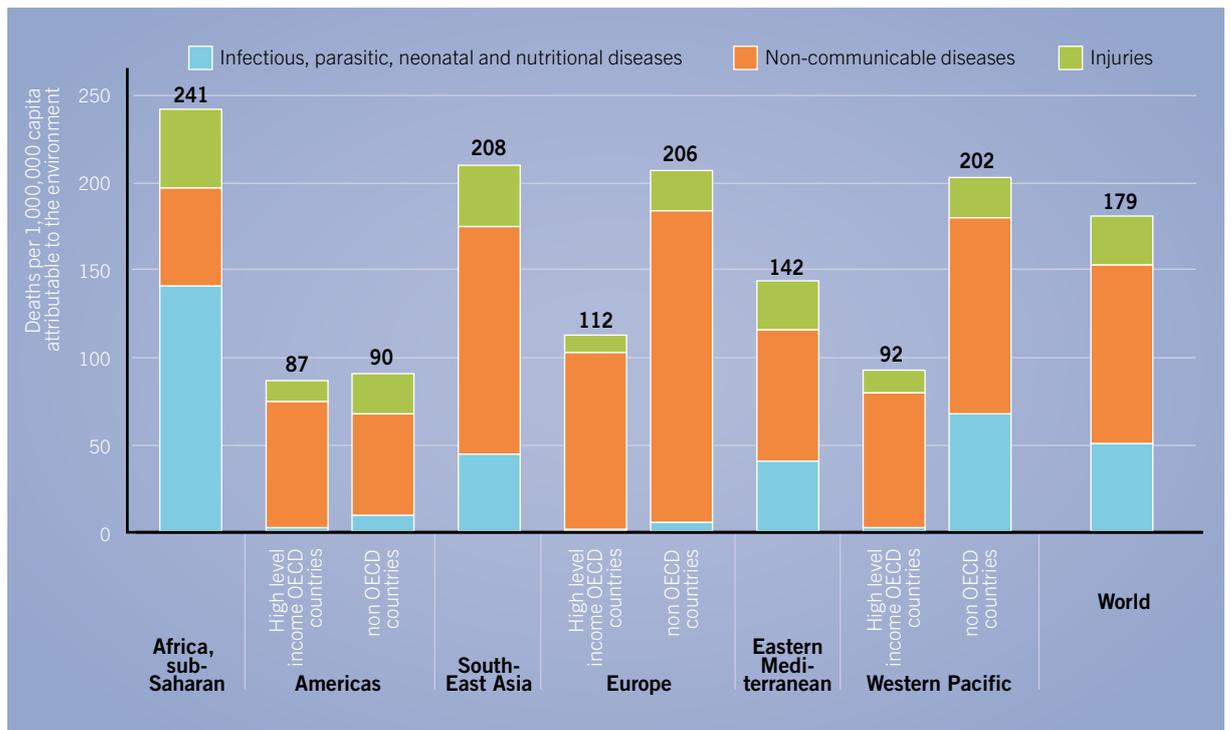
^a This report uses the broader WHO definition of "health as the state of complete physical, mental and social well-being and not merely the absence of disease".

Figure ES1 Trend in the proportion of deaths attributable to the environment by disease group, 2002 – 2012



Source: WHO (2016) Preventing disease through healthy environments. A global assessment of the burden of disease from environmental risks

Figure ES2 Deaths per capita attributable to the environment, by region and disease group, 2012



Source: WHO (2016) Preventing disease through healthy environments. A global assessment of the burden of disease from environmental risks

The number of deaths attributable to the environment represents 22 per cent of the total number of deaths in the Eastern Mediterranean region, respectively 11 per cent and 15 per cent in the Organization for Economic Cooperation and Development (OECD) and non-OECD member countries of the Americas region, and 15 per cent in Europe.

These estimates, however, do not take into account the effects of emerging global environmental changes, which risk reversing decades of progress in health and development through the combined effects of climate change, biodiversity loss and the degradation of the natural systems that support all life.

Box ES1 The diseases with the highest preventable disease burden from environmental risks, in disability adjusted life-years:

- 1. DIARRHOEAL DISEASES:** 57 per cent because of environmental risks, 57 million years life lost or lived with disability due to poor water, sanitation, hygiene.
- 2. UNINTENTIONAL INJURIES (other than road traffic):** 50 per cent because of environmental risks, 74 million years life lost or lived with disability because of occupational risks and poor home and community safety.
- 3. ASTHMA:** 44 per cent due to environmental risks, 11 million years life lost or lived with disability because of air pollution, second-hand tobacco smoke, indoor mould and dampness, and occupational asthmagens.
- 4. MALARIA:** 42 per cent due to environmental risks, 23 million years life lost or lived with disability because of poor waste, water and environmental management.
- 5. ROAD TRAFFIC INJURIES:** 39 per cent due to environmental risks, 31 million years life lost or lived with disability because of poor road design, traffic system environments, poor land-use planning.
- 6. LOWER RESPIRATORY INFECTIONS:** 35 per cent due to environmental risks, 51 million years life lost or lived with disability as a result of household and ambient air pollution, second-hand tobacco smoke.
- 7. CHRONIC OBSTRUCTIVE PULMONARY DISEASE:** 35 per cent due to environmental risks – 32 million years life lost or lived with disability because of household air pollution, and workers' exposure.
- 8. CARDIOVASCULAR DISEASES:** 30 per cent due to environmental risks, 119 million years life lost or lived with disability because of household and ambient air pollution, second hand tobacco-smoke, exposure to chemicals.
- 9. CANCERS:** 20 per cent due to environmental risks, 49 million years life lost or lived with disability because of air pollution, management of chemicals, radiation and poor workers' protection.
- 10. MUSCULOSKELETAL DISEASES:** 20 per cent due to environmental risks, 23 million years life lost or lived with disability because of occupational stressors, poor work postures, prolonged sitting, carrying water and solid fuels for household needs.

Source: WHO



A CLEAR NEXUS EXISTS BETWEEN ENVIRONMENTAL QUALITY AND HEALTH

Air pollution is the world's largest single environmental risk to health: some 7 million people across the world die each year as a result of everyday exposure to poor air quality. Who is affected depends on exposure and occupation. In some countries, simply preparing a meal is a major risk to health because of indoor air pollution with 4.3 million deaths attributed to household air pollution arising from cooking with solid fuels. Exposure is particularly high among women and young children, who spend the most time near the domestic hearth. Children, the old and those with low immunity are especially vulnerable. Lack of access to clean water and sanitation causes 58 per cent of cases of diarrhoeal diseases in low and middle-income countries. Unsafe water, inadequate sanitation or insufficient hygiene result in 3.5 million deaths worldwide, representing 25 per cent of the premature deaths of children younger than 14. The 50 biggest active dumpsites affect the daily lives of 64 million people. Some 107,000 people die annually from exposure to asbestos and 654,000 died from exposure to lead in 2010. Since the first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in 1995, 606,000 lives have been lost and 4.1 billion people have been injured, left homeless or in need of emergency assistance as a result of weather-related disasters.

High-risk occupations include agriculture, mining and construction – often with a relatively high proportion of children, youth or migrant workers who have substantially higher rates of fatalities and exposure to chemicals and injuries. Vulnerable groups also include those living in poverty and those at greater risk owing to certain occupations, livelihoods and locations. Widespread land and coastal degradation greatly exacerbates the effects of extreme weather, destroys livelihoods and food security, threatens health and well-being, and subsequently even forces people into migration. The social and economic groups that are vulnerable to these environmental impacts often also suggest an environmental injustice at play, as the rich reap benefits from the activities that create the degradation and it is the poor and vulnerable groups who are most affected.

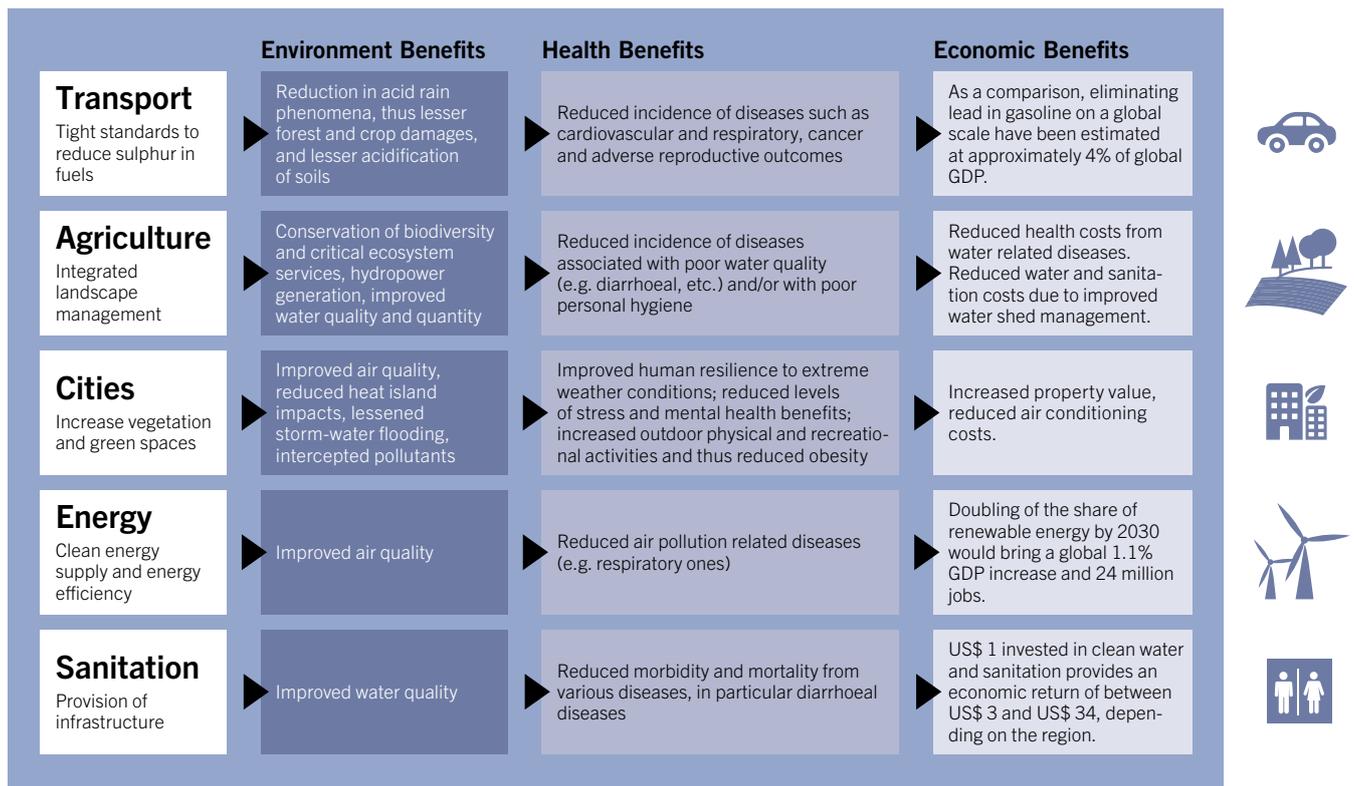
Climate change is acknowledged as a major health risk multiplier, with existing effects that are expected to increasingly affect human health, including through negative changes to land, oceans, biodiversity and access to freshwater, and the increasing frequency and higher impact of natural disasters. Cautious estimates from the World Health Organization (WHO) under a medium-high emissions scenario indicate that 250,000 additional deaths could potentially occur each year between 2030 and 2050 as a result of climate change. It may also lower the national quality of dietary intakes and worsen obesity. Environmental degradation is estimated to cause 174–234 times as many premature deaths as occur in conflicts annually. Mental health issues also rank amongst the ten

largest non-fatal threats in most countries.

The degradation of ecosystems also entails major health-related consequences. Microplastics and nanoplastics in marine ecosystems may not be biodegradable, as they can sink to the ocean floor where they are not exposed to the sunshine required for biodegradation. Excessive nutrients in fresh and coastal receiving waters from land-based activity leads to eutrophication, negatively affecting ecosystems, and freshwater and marine resource productivity, thereby impacting food security, livelihoods and health negatively. Zoonotic diseases, linked to ecosystem disruption, such as avian influenza, Rift Valley fever and Ebola, have also

become the source of major pandemics. The outbreak of Zika, for example, is potentially exacerbated as a result of inadequate waste collection and management – the proliferation of tyres, plastics, cans, etc., in which water collects and which serve as breeding sites for the *Aedes aegypti* mosquito. Important ecosystem services are lost such as pollination, natural pest control and access to herbal and traditional medicines important for large shares of the world’s population. Furthermore, many of these ecosystems are also carbon sinks.

Figure ES3 Examples of multiple benefits of inclusive green policies



INVESTMENTS IN A HEALTHY ENVIRONMENT HAVE MULTIPLE BENEFITS

The economic costs of premature deaths from ambient particulate matter and household air pollution in the European Union in 2010 was estimated at \$1.5 trillion. For the insurance industry, the estimated cumulative cost of asbestos-related claims over decades in the United States of America alone had reached \$117 billion by 2010. Evidence exists, however, of the catalytic and multiple benefits of investing in environmental quality in terms of development, poverty reduction, resource security, reduced inequities and reduced risks to human health and well-being. Benefits from eliminating lead in gasoline on a global scale have been estimated at \$2.45 trillion per year, or 4 per cent of the global gross domestic product (GDP), saving an estimated 1 million premature deaths per year. Implementing proven, cost-effective measures to reduce emissions of short-lived climate pollutants such as black carbon and methane are expected not only to reduce global warming by 0.5°C by the middle of the century, but also to save 2.4 million lives a year from reduced air pollution by 2030.

Clean air and water, sanitation and green spaces, and safe workplaces can enhance the quality of life of people: reduced mortality and morbidity, healthier lifestyles, improved productivity of workers and their families, improved lives of women, children and elderly, as well as other vulnerable populations, such as indigenous communities, and are crucial to mental health. WHO estimates that investments in preventative workplace health programmes of around \$18–\$60/worker can reduce sick leave absences by 27 per cent and that the return on investment in water and sanitation services is between \$5 and \$28 per dollar. Inclusive green policies are known to have benefits across the spectrum – environmental, economic and social (figure ES3).



A FRAMEWORK OF FOUR INTEGRATED LINES OF ACTIONS IS RECOMMENDED TO ADDRESS THE NEXUS OF ENVIRONMENT AND HEALTH:

→ **DETOXIFY:** Remove harmful substances from and/or mitigate their impact on the environment in which people live and work. This will, for example, address air pollution, through reducing black carbon emitted by household and non-household sources and other pollutants, ensure that emission concentrations do not exceed WHO recommended targets for particulate matter 2.5 and carbon monoxide and the reduction of use of pesticides, through the promotion of integrated pest management and organic and sustainable farming systems. It will require stronger focus on the sound management of chemicals through life-cycle approaches and improved management and reduction of waste.

→ **DECARBONIZE:** Reduce the use of carbon fuels and thereby emissions of carbon dioxide (CO₂) through substitution of non-carbon energy. Over their life cycle, the pollution-related human health and environmental impacts of solar, wind and hydropower are a factor of 3 to 10 times lower than fossil-fuel power plants. Investing in green energy at household level will accrue other benefits, including more time for income-generating activities, reduced health risks from carrying heavy loads of firewood over long distances, and more leisure time available for women, among others. The nationally determined contributions (NDCs) committed under the Paris Agreement on climate change can be important vehicles for decarbonization, and consequent health and well-being improvements.

→ **DECOUPLE RESOURCE USE AND CHANGE**

LIFESTYLES: Generate the needed economic activity and value to sustain the world's population with less resource use, less waste, less pollution, and less environmental destruction. Important health benefits can be gained from decoupling opportunities in the food sector, in water use, in energy consumption and through recycling and more sustainable household consumption. For example, shifts in consumption from animal to plant-based products, and improved diet composition and quality as well as increased access to urban green areas have positive implications for health and addressing non-communicable diseases and mental health. Youth engagement, awareness-raising and education in particular need to be prioritized to achieve this.

→ **ENHANCE ECOSYSTEM RESILIENCE AND PROTECTION OF THE PLANET'S NATURAL SYSTEMS:**

Build capacity of the environment, economies and societies to anticipate, respond to and recover from disturbances and shocks through: protection and conservation of genetic diversity, terrestrial, coastal and marine biodiversity; strengthening ecosystem restoration, in particular of wetlands, dryland vegetation, coastal zones and water sheds including through reforestation as well as agro-ecosystem restoration and sustainable farming systems; reducing pressures from livestock production and logging on natural ecosystems to increase resilience and mitigate extreme weather conditions of storms, drought and floods. Sustainable land and forest management, along with conservation and restoration, will protect and enhance biodiversity and ecosystem services. These restorative activities will not only ensure food security, but also nurture cultural, social and recreational activities, and bring economic growth for local populations and businesses.

Analyses of past successes reveal that these endeavours are far from trivial. They can, however, be achieved when supported by a context-appropriate mix of targeted, integrated strategies, such as:

- Strengthened multi-level governance at the nexus of environment and health;
- Integrated evidence-based policies and instruments, including legal and fiscal, that translate policy to action across sectors and industries;
- Cross-sectoral partnerships and platforms to incubate, catalyse, accelerate, and scale health-environment research, innovation, technologies, innovative financing, and practices;
- Improved individual, household, and societal knowledge, attitudes, behaviours and practices through systematic communication, awareness-raising and education interventions;
- Assessment, measurement, research and monitoring to ensure an adequate formative process, and a research framework that engenders the evidence base that all investment and action demand.

While the above framework seeks to address the nexus at a broad macro, intersectoral level, the following are leverage points requiring urgent policy attention and action based on the evidence:

- Improve indoor household and ambient air quality to enable reductions in morbidity and enhance the quality of life of local populations and across borders, including through sustainable urban design which can also contribute to increased physical activity through the provision of green spaces, to prevent and reduce non-communicable diseases and poor health;
- Replace and reduce the utilization of hazardous chemicals and generation of toxic waste, and ensure sound management of chemicals and wastes;
- Intensify progress in providing safe water, improved sanitation and hygiene services to reduce mortality, morbidity, and losses in economic productivity;
- Restore and protect degraded ecosystems and mitigate stresses to the Earth's natural systems in order to enhance ecosystem services that support human health, reduce exposure to natural disasters, enhance food security, and prevent emergence of novel pathogens and disease outbreaks and contribute to the improvement of nutritional diet quality.



Figure ES4 summarizes examples of interventions to achieve the above objectives within the broad framework of actions and strategies.

In conclusion, directly tackling the interlinkages between environment and human can provide a common platform and multiplier effect to sustain progress across many of the Sustainable Development Goals and deliver on the Agenda 2030 for Sustainable Development in a more cost-effective and beneficial manner. Investments in preserving, improving or restoring environmental quality can bring out positive interactions and be catalytic, avoiding contradictions among sector strategies and delivering multiple benefits across all goals for an enhanced well-being and quality of life.

RECOMMENDATIONS

The report's findings provide a strong basis for an inclusive economy for the future that is linked to ecosystem resilience, a healthy environment, and people's good health and well-being. Its main recommendations are:

1. Deliver more effectively and equitably on the 2030 Agenda for Sustainable Development by using the environment-health nexus as a cross-cutting solution through international, regional, national and local cooperation.
2. Invest in environmental sustainability and genetic diversity which can serve as an insurance policy for current and future health and human well-being.
3. Address the environment health nexus on efficiency grounds, but also for distributive justice and to address the ethical and legal obligations of States.
4. Move from a reactive to a proactive policy approach, as many environment and health emergencies can be avoided or mitigated, pre-empting crises that otherwise might cripple a country's economic, political and physical infrastructure.
5. Involve the public and private sector, researchers, relevant stakeholders and citizens to participate in partnerships which can foster innovation, clean technologies, innovative financing and disseminate good practices.
6. Take action at all levels of governance to: detoxify the environment; decarbonize the economy; decouple economic activity from current levels of resource use and ecosystem degradation and change unhealthy lifestyles; and enhance ecosystem resilience.
7. Strengthen the evidence base through better measurement and monitoring frameworks, supporting platforms on environment-health research, systematically collecting, analysing and using data disaggregated by sex, age and other relevant variables.
8. Raise awareness on major environment and health risks and exposure, putting into place adequate communication and education strategies and policies.
9. Strengthen multilevel environmental governance, develop and implement integrated policies, international and national legislation and actions with an emphasis on city-level interventions incorporating specific measures targeting the most vulnerable, including women and children, and through them future generations.
10. Finally, call upon governments at all levels and development and financial partners to scale up investments in platforms, initiatives and programmes that address the environment and health nexus to spearhead the achievement of the Sustainable Development Goals.



Figure ES4 Some proposed interventions to address key leverage points for policy attention and action

PRIORITY ENVIRONMENT AND HEALTH RISKS / STRATEGIES	STRENGTHENED GOVERNANCE	INTEGRATED POLICIES
AIR QUALITY → DETOXIFY → DECARBONIZE → DECOUPLE and ENHANCE HEALTHY LIFESTYLES		1. Develop and implement national integrated low-carbon and low emission development strategies based on the consensus around the Sustainable Development Goals and outcomes of the Paris Climate Agreement 2. Reduce the use of fossil fuels in power plants
SOUND MANAGEMENT OF CHEMICALS → DETOXIFY → DECOUPLE and ENHANCE HEALTHY LIFESTYLES	7. Accelerate the ratification process of the Minamata Convention on Mercury and develop and enhance comprehensive chemicals management legislations, policies and strategies on reducing or eliminating the use and production of persistent organic pollutants (POPs), regulating the use of chemicals of highest concern and controlling, when relevant, their international trade 8. Eliminate lead in paint	9. Develop and implement integrated pest management and integrated vector management
ACCESS TO WATER AND SANITATION → DETOXIFY	15. Adopt UNEP International Water Quality Guidelines for Ecosystems for use by countries in developing national standards, policies and frameworks for water quality in the environment	16. Invest in providing access to clean water and sanitation in schools and hospitals and city slums
SOUND MANAGEMENT OF WASTES → DETOXIFY → DECOUPLE and ENHANCE HEALTHY LIFESTYLES	18. Develop comprehensive legislation and policies to address prevention and minimization and environmentally sound management of wastes, avoid open-burning and dumping, and control international trade of wastes, such as electric and electronic wastes and mercury wastes	19. Develop action plans to reduce plastic litter in the environment
RESPONSES TO NATURAL DISASTERS → ECOSYSTEM RESILIENCE		22. Develop and implement national and local ecosystem-based disaster risk reduction strategies integrating sustainable natural resource management and landscape planning in rural, coastal and urban settings

COMMUNICATE AND EDUCATE	PARTNER	MEASURE AND MONITOR
<p>3. Promote citizen access to information on air quality (and other) standards and actual levels to contribute to the establishment and enforcement of ambient air quality standards, based on WHO guidelines</p>	<p>4. Expand access to clean and affordable domestic cooking, heating and lighting technologies and fuels</p> <p>5. Provide financial resources, invest and improve city designs to promote public and active transportation, green space, sound waste management, infrastructure and sustainable building</p>	<p>6. Establish and enforce advanced vehicle emissions and fuel standards</p>
<p>10. Label and share information on chemicals in products in a manner that is adapted and understandable by users and increase information sharing on chemicals related exposure and risks.</p>	<p>11. Promote ozone friendly refrigeration and air conditioning</p> <p>12. Accelerate efforts to eliminate polychlorinated biphenyls (PCBs) to meet Stockholm convention obligations and deadlines</p> <p>13. Implement safety measures for workers who are in contact with hazardous chemicals</p>	<p>14. Identify pollution/chemicals related hotspots (e.g. chemical stockpiles, polluted sites) to decontaminate them and minimize exposure</p>
	<p>17. Recycle nitrogen and phosphorous from waste water systems in cities, agriculture and industries</p>	
<p>20. Promote waste prevention and minimization, including food waste, for example through extended producer responsibility; where waste is produced, promote reuse and recycling into material and energy sources (e.g. stimulate industrial symbiosis, support recovery and recycling schemes)</p>	<p>21. Promote social inclusion of all stakeholders in waste management practices, including in the informal sector, giving them opportunities to formalize their operations and employ practices that minimize risks to human health and the environment</p>	
<p>23. Promote the use of traditional knowledge, in particular the use of medicinal plants</p>	<p>24. Restore degraded ecosystems</p>	<p>25. Strengthen the linkages between local and sub-national early warning, preparedness and response mechanisms</p>

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ISBN number: pending