

# 4 Changing the path we are on

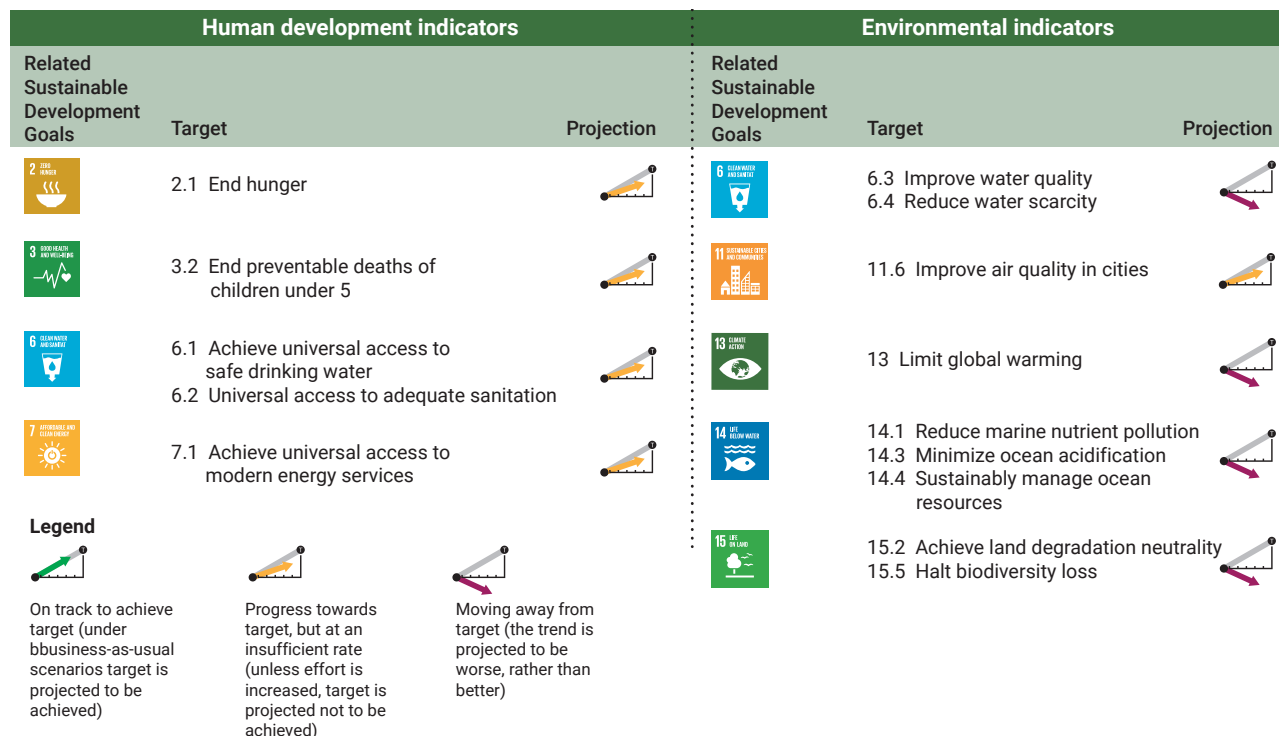
## 4.1 The need for urgent, sustained and inclusive action

Without additional policies, trends in environmental degradation are projected to continue at a rapid rate and the related Sustainable Development Goal targets and internationally agreed environmental goals are not expected to be achieved, including on climate change, biodiversity loss, water scarcity, excess nutrient run-off, land degradation and ocean acidification (*well established*). Current patterns of consumption, production and inequality are not sustainable, adding to other severe environmental pressures. Many environmental indicators are projected to move in the wrong direction. Projected population growth, urbanization trends and economic development will significantly increase demand for natural resources, such as food, energy and water, towards 2050. Under a business-as-usual scenario, resource efficiency in production and consumption, agricultural yields and nutrient use, water and energy efficiency are projected to increase, thereby partially offsetting demand for key environmental resources. However, such improvements will be inadequate to reduce the pressure on already-stressed environmental systems. (21.3.1–21.3.5)

Indicators related to human development are projected to improve, but trends are insufficient to meet related targets (*established but incomplete*). Improvements are projected on global hunger, and access to safe drinking water, adequate sanitation and modern energy services, but significant inequality of access remains, and those improvements are not expected to take effect quickly enough for many countries to achieve the related Sustainable Development Goal targets. Preventable environment-related health risk factors are projected to remain prominent in 2030. Related global child mortality is projected to decrease, but not sufficiently for many developing countries to achieve the related Development Goal target, in particular in sub-Saharan Africa. Furthermore, air pollution is expected to continue to contribute to millions of premature deaths in the coming decades. (21.3.2, 21.3.3, 21.3.4, 21.3.6)

Overall, the world is not on track to achieve the environmental dimension of the 2030 Agenda for Sustainable Development and internationally agreed environmental goals by 2050. Urgent action is now needed to reverse those trends and restore both environmental and human health to the planet (*established but incomplete*). Future projections show that development is either

Figure SPM.8. Projected global trends in target achievement for selected Sustainable Development Goals and internationally agreed environmental goals



Note: Many Sustainable Development Goal targets and internationally agreed environmental goals are broader in scope than shown in the above figure, which only assesses selected targets or elements of targets. The icons shown indicate the related Sustainable Development Goal. Trends are based on an assessment of business-as-usual projections in the scenario literature. For several target elements, trends are confirmed by multiple studies (SDG targets 2.1, 3.2, 7.1, 6.4, 11.6, 14.3 and 15.5, and SDG 13), while for others, only limited scenario literature was available. (SDG targets 6.1, 6.2, 6.3, 14.1, 14.4 and 15.2) (Table 21.2)

too slow to achieve the targets or even that it moves in the wrong direction (see figure SPM.8). Continuing failure to take urgent action is leading to ongoing and further potentially irreversible adverse impact, including on critical environmental resources and human health. {Section 2.2} Current patterns of consumption and production may be more expensive in the long term for many countries, as it often costs more to clean up later than it does to prevent damage now, added to which cleaning up later may not always be possible. For example, a further delay in climate action increases the cost of achieving the goals of the Paris Agreement, and at some point will make it impossible to achieve them. {21.3.3, 21.4, 24.4}

## 4.2 Transformative change and an integrated approach are needed

**Pathways exist that show that the healthy planet needed for sustainable development can be achieved** (*established but incomplete*). The literature includes many scenarios that provide information on the ways in which the Sustainable Development Goals, multilateral environmental agreements and related internationally agreed environmental goals can be achieved. Those pathways emphasize a number of key transitions in moving towards a healthy planet. They are associated with achieving sustainable consumption and production patterns for energy, food and water in order to provide universal access to those resources, while preventing climate change, air pollution, land degradation, loss of biodiversity, water scarcity, and overexploitation and pollution of oceans. They include changes in lifestyle, consumption preferences and consumer behaviour on the one hand, and cleaner production processes, resource efficiency and decoupling, corporate responsibility and compliance on the other hand. {22.3}

**Transformative changes are needed to meet the Sustainable Development Goals, multilateral environmental agreements and related internationally agreed environmental goals. They go beyond what can be achieved by environmental policies alone** (*established but incomplete*). The rate of change in the pathways indicates that incremental environmental policies alone will not suffice. A mix of social and technological improvements and innovations is required, facilitated by effective policy measures and cooperation on a scale from the local to the international. {22.4.1}

**Meeting the targets related to climate change, reducing air pollution and providing sustainable energy for all is possible. Measures can be combined in different ways but need to be implemented rapidly and at an unprecedented scale** (*well established*). It involves investment in energy access, enhancing the development and implementation of energy-efficiency improvements, lifestyle changes, a more rapid introduction of low greenhouse gas-emission technologies (including sustainable and equitably-produced bioenergy, hydropower, solar, wind and carbon-capture-and-storage), air pollution control and reducing emissions and increasing removals from land use and land-use change and forestry of anthropogenic greenhouse gas emissions (including non-CO<sub>2</sub> greenhouse gas emissions from agriculture). Pathways consistent with the Paris Agreement are characterized by a reduction of carbon intensity in the global economy of 4 to 6 per cent per annum between now and 2050 (compared with 1 to 2 per cent per annum historically), which would reduce energy

system greenhouse gas emissions to almost zero by 2050. {22.3.2}

**Eliminating hunger, preventing biodiversity loss and halting land degradation is possible by combining measures related to consumption, production, waste and redistribution of food, and nature conservation policies** (*established but incomplete*). Scenarios achieving those social and environmental targets are typically characterized by a 50 per cent faster improvement in agricultural yields than a business-as-usual scenario, but depend heavily on changes on the consumption side and improvements in food distribution. Halting biodiversity loss would also require measures related to landscape management and protected areas. Ecological infrastructure can buffer farmers and rural and urban communities against climate shocks such as droughts and floods, mitigate water pollution and increase water supply, while at the same time protecting biodiversity. Sustainable agriculture also requires a reduction in the nitrogen and phosphorus imbalance to reduce pollution of freshwater systems, groundwater and coastal zones in oceans. Reducing water scarcity requires more efficient water use, increasing water storage and investing in desalination. Ambitious scenarios in the literature typically show higher water-use efficiency rates than in business-as-usual scenarios, but still fail to reach full water security. {22.3.1, 22.3.3, 22.3.4}

**Synergies exist between specific measures and a broad range of sustainability targets, including measures related to education, promoting sustainable consumption, specifically a healthy diet and reducing air pollution** (*well established*). Improved education, especially for women and girls, has a particularly strong connection with health outcomes, economic growth, reduced poverty and better environmental management. Meat products require more land than crops (see figure SPM.4). Therefore, promoting sustainable and healthy diets, reducing food waste in both developing and developed countries, and adopting sustainable agricultural practices would contribute towards meeting the nutritional needs of the 9–10 billion people projected to be on the planet in 2050. In doing so, synergies could be realized between improving health and nutrition, while reducing biodiversity loss, advancing habitat restoration and preventing land degradation and water scarcity. Phasing out the use of fossil fuels and moving towards lower-carbon-emission fuels, including sustainable bioenergy, would lead to important co-benefits, achieving both climate and air-quality targets, the latter also having synergies with improving human health, increasing agricultural production and reducing biodiversity loss. {22.4.2}

**There are also potential trade-offs between achieving different sustainability targets. Land-based climate change mitigation, namely bioenergy crop production, and agricultural intensification are key measures for achieving climate and food targets respectively, but could have significant detrimental effects on other environmental targets if not managed carefully** (*well established*). While nearly all scenarios consistent with the Paris Agreement rely on land-based mitigation measures, their use increases demand for land and could thus have a potentially massive influence on land-use patterns and eventually lead to higher food prices, which would in turn affect food security. Increasing agricultural yields would improve overall food availability and reduce pressure on natural land. Applying unsustainable agriculture practices could lead to land degradation, hypoxia, harmful algal blooms, biodiversity loss and an increase in greenhouse gas emissions. {22.4.2}

**Understanding the interlinkage between measures and targets is crucial for synergistic implementation and policy coherence** (*well established*). Integrated approaches would enable synergies to be grasped and potential trade-offs to be dealt with so that environmental targets could be achieved simultaneously. {22.4.2}

### 4.3 Innovation for systemic transformation to achieve environmental goals

**Coordinated and ambitious policy, coupled with social and technological innovation, could enable the achievement of the Sustainable Development Goals, related multilateral environmental agreements and internationally agreed environmental goals** (*established, but incomplete*). Transformative pathways to sustainable development require the following: (i) vision to guide systemic innovation towards sustainability; (ii) social and policy innovation; (iii) phasing-out of unsustainable practices; (iv) policy experimentation; and (v) engaging and enabling diverse actors, including local and indigenous people. Integrated approaches can help to deal with the synergies and potential trade-offs between the various policies and measures. A vision for sustainable development and leadership can energize popular support. Examples of integrated policies for achieving sustainability goals include providing economic incentives, including the removal of environmentally harmful subsidies, improving price structures and introducing taxes to internalize social and environmental costs. {24.3}

**Transformative projects and innovative solutions exist that could collectively help in achieving the Sustainable Development Goals, the aims of multilateral environmental agreements and internationally agreed environmental goals** (*unresolved*). Social, policy and technological innovation is needed. At the local level, many transformative projects and innovative solutions already exist that could be scaled appropriately. Reviewing bottom-up initiatives reveals ideas, actions and programmes that seek to achieve the Sustainable Development Goals and involve a wide range of public and private stakeholders, including the following: (i) nature-based solutions, including those that draw on indigenous knowledge, such as ecological infrastructure and ecological restoration; (ii) monitoring and reporting innovations, including Earth observation systems, for better information on environmental conditions, citizen science initiatives that involve citizens in environmental monitoring and which involve decentralization of technologies to educate and engage citizens (for example, web applications that allow citizens to monitor water quality and report problems to relevant government agencies), and natural capital accounting that integrates economic, social and environmental components; (iii) circular and sharing economy innovations that involve the increased efficiency of resource use, specifically through new business models that better engage with waste products of other production processes and innovations related to the peer-to-peer sharing of goods and services; (iv) innovations and policies that help to reduce toxic substances and solid waste, including plastic waste; (v) improving public awareness and building relevant skills through sustainability and environmental education; (vi) an emphasis on gender equality, the empowerment of women and solutions that promote the fair treatment of all, from the local level to the global arena; and (vii) smart, sustainable cities that, for example, use modern digital technologies to engage and connect with citizens in addressing key sustainability challenges for cities, such as transportation, consumption patterns, energy, nutrition, water and waste management. {17.7, 23.11.1}

**Financial investment and engagement of individuals, businesses and other non-governmental stakeholders are critical to the achievement of this agenda** (*established, but incomplete*). Unsustainable products and industrial processes could be phased out by introducing the following: (i) new regulatory mechanisms setting standards (for example, securing land tenure rights); (ii) financial mechanisms to boost sustainability investment (for example, on rural electrification), improve chemical use efficiency and minimize harmful chemicals, and to account for both market and non-market risks and impact; (iii) environmental education and education for sustainable development to enhance awareness and competencies for sustainability-driven consumer choices, entrepreneurship, greater corporate social responsibility and promoting viable business models; (iv) exploration and promotion of pathways that provide opportunities for all stakeholders to participate in a well-being economy; (v) overcoming the inertia of existing unsustainable technologies and vested interests and (vi) economic instruments that set a price on pollution. {23.11, 24.3}

**Transformative change requires adaptive policy, the creation of an enabling environment for niche innovations and the removal of barriers to change** (*established, but incomplete*). Political, institutional and lifestyle changes can enable a sustainable and inclusive transition to environmental sustainability. Local-scale policy experiments provide space for policy tailoring and innovation that is closely monitored, and also allow for the inclusion of systems of local and indigenous knowledge for improved environmental management. Redress for environmental degradation through legal mechanisms such as access to courts and justice also provide an important mechanism for ensuring inclusive access to a clean and healthy environment for all. {23.11, 24.2}

**Participatory approaches can help decision-makers and non-State actors to identify and pursue innovative solutions towards sustainability** (*established but incomplete*). Participatory and grassroots approaches could provide a useful set of initiatives and aspirational visions, pathways and solutions from stakeholders to achieve the Sustainable Development Goals and multilateral environmental agreements. That includes inclusive innovation, in which power and decision-making is relatively decentralized and externalities are internalized. Furthermore, such approaches can highlight gaps and blind spots in distributional equity, responsibility and capacity to address global environmental problems and their solutions. Participatory approaches can help to deliver context-relevant solutions. For example, decentralized renewable energy and microgrids fit neatly into many bottom-up sustainable visions that challenge traditionally modelled large-scale, centralized energy transitions. Accounting for regional differences, gender and other demographics are important for assessing and addressing problems, including the need for disaggregated data. Sustainable Development Goal policy design and implementation requires alignment of the collective well-being of actors from the local to other levels, taking into account in particular the needs of the vulnerable and most marginalized in society. Information and communications technology can drive change, if risks such as privacy are minimized. {23.9.2, 23.14, 24.3.5}

**Strengthened international cooperation, including support to least developed countries, is needed to tackle this agenda** (*well established*). International cooperation and support, coupled with financial commitment and international funding,



are critical if this agenda is to be achieved. Effective governance solutions to improve multilevel and multi-country cooperation and harmonization across scales include improved management of interdependencies to reduce interregional inequalities. Bilateral, plurilateral and multilateral environmental treaties are important governance mechanisms for achieving inclusive and sustainable development across knowledge systems. {11.4, 19.1, 23, 14}

#### 4.4 The benefits that will result from following more sustainable future pathways

**Investments in policies that address environmental issues promote human health and well-being, prosperity and resilient societies** (*well established*). Mobilizing financial resources for sustainable development is necessary to resolve environmental problems and ensure environmental protection, especially in developing countries. Sustainable future pathways are intended to create a “healthy planet, healthy people”. A healthy planet will result in people who live longer, healthier lives: nearly one quarter of all deaths globally in 2012 could be attributed to modifiable environmental risks, with a greater portion occurring in populations in a vulnerable situation and in developing countries. Achieving the Sustainable Development Goal targets on hunger, access to safe drinking water and sanitation and modern energy

services could reduce deaths in children under 5 related to malnutrition, diarrhoea and lower respiratory infections by more than 400,000 per year by 2030. Furthermore, air pollution is the largest environmental health risk and is projected to continue to have significant negative effects on health, with scenario studies estimating between 4.5 million and 7 million premature deaths by mid-century under a business-as-usual scenario. Combined climate and air pollution policies could reduce those numbers significantly. {5.4.1, 21.3.3, 21.3.6, 22.3.2, 22.3.5, 23.12, 24.4}

**Improved health outcomes have significant economic benefits (through a larger and healthier labour force), as well as demographic implications** (*established but incomplete*). The health co-benefits of reducing greenhouse gas emissions and air pollutants can outweigh the costs of mitigation. For example, global health savings for reaching a 2 degrees Celsius target are estimated to be approximately US\$54 trillion, compared with global policy costs of approximately US\$22 trillion. Decreased child and maternal mortality, especially when combined with female education and access to sexual and reproductive health services, including modern contraception, is likely to lead to lower fertility rates in the longer term, curbing population growth, one of the major drivers of environmental degradation, thus highlighting the fact that healthy people can also support a healthy planet. {2.3, 22.3.5, 24.4}

