

- **Transforming the food system requires actions from policymakers, regulators, the food industry, the financial sector, farmers, researchers, communities and individuals**, including:

- shifting to healthy and sustainable diets, including greater consumption of plant-based foods;
- adopting more sustainable and resilient food production practices;
- reducing food losses and waste and enhancing circularity across food systems;
- accelerating the development and uptake of novel alternative proteins, such as cultivated meat; and
- reforming food markets and trade, e.g., diversifying agribusiness supply chains and incentivizing environmentally responsible practices.

- **Improved management of the environment system for sustainability and resilience requires actions**, including:

- protecting, conserving and restoring ecosystems and biodiversity, in conjunction with sustainable land management practices;
- adopting adaptive governance to safeguard the rights, access and benefits of Indigenous Peoples over their traditional lands, and draw on their knowledge;
- embracing the widescale implementation of nature-based solutions, to restore and maintain healthy socio-ecological systems; and
- ensuring the emerging bioeconomy is circular and sustainable.

## 4 The design of solution pathways should be tailored for the social, economic and ecological context of each region.

- **The global environmental crises are adversely affecting every region of the world, albeit with wide variability**, curtailing socioeconomic development, with the most severe consequences being experienced by the most vulnerable and disadvantaged populations. Within each region, sub-regional differences in vulnerability, capacity, and priorities should be recognized when tailoring transformation pathways.

- **Regions are interlinked through human and natural systems driven by processes such as trade, investment, tourism, migration, species invasion, and ecosystem services flows, which can have benefits, such as international trade, as well as adverse impacts, for instance, the exploitation of labour and natural resources.** As the systems transform regionally, these dynamics can change. The solution pathways presented in GEO-7 for transforming the systems and their implications are specific to each region, which accounts for their common and differentiated but specific priorities. The identified levers of action are specific to the system being transformed, the underlying conditions and the priorities of the regions.

- **Tailored solution pathways and system transformations are needed to address issues specific to each region or country** that consider their sociocultural, economic, development, environmental, governance and financial circumstances, as well as issues common to all regions.

- **Recognizing that all countries care about sustainable economic growth**, high-income countries can more easily adopt ambitious green policies, reduce resource consumption, acknowledge the principle of common but differentiated responsibility, halt the export of negative environmental impacts, and leverage global sustainability through finance and technological capacity. Middle-income countries can embrace innovative infrastructure development and green policies. Low-income countries can overcome challenges such as hunger and poverty, improve livelihoods, build climate-resilient communities and infrastructure, while reducing emissions by leapfrogging outdated technologies and leveraging targeted investments and international support.

The Global Environment Outlook (GEO) is the United Nations Environmental Programme (UNEP) flagship assessment of the state of the planet. It represents the work of hundreds of leading environmental scientists, exploring in unparalleled detail how our environment is changing and, even more importantly, what we can do about it.

First published in 1997, GEO equips policymakers with the latest science to tackle environmental challenges and crises, including climate change, nature and biodiversity loss, desertification, and pollution and waste. It examines how well current policies are working and how decision-makers and communities around the globe can act together to achieve a better, more sustainable future.

Connecting science and policy, GEO provides science for policy action.

## A call to action

“As the Global Environment Outlook 7 reminds us: Now is the time for courage and creativity.”

UN Secretary-General, António Guterres

A systems transformation can still happen. It's not too late to change course and forge a fairer, more sustainable future for all.

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# A future we choose

Why investing in Earth now can lead to a trillion-dollar benefit for all

## Key Messages



1

Despite global efforts and calls for action, our planet has already entered into uncharted territory, facing global environmental crises of climate change, biodiversity loss, land degradation and desertification, and pollution and waste. These interconnected crises, which are undermining human well-being and are primarily caused by unsustainable systems of production and consumption, reinforce and exacerbate each other and need to be addressed together.

■ **The situation is worsening:**

- **The rate of global warming is likely to be higher than the central estimates of previous IPCC projections, increasing the risk of irreversibly passing several climate tipping points<sup>1</sup> within the next few decades.** These include major shifts in ocean circulation, accelerated ice sheet loss, widespread permafrost thaw, forest die-back, and collapse of coral reef ecosystems.
- **One million of an estimated eight million species are threatened with extinction, some within decades.** The populations of many more species are in decline, and their genetic diversity is being significantly eroded.
- **Between 20 and 40 per cent of land area was estimated to be degraded in 2022.** Between 2015 and 2019, at least 100 million hectares (the size of Ethiopia or Colombia) of fertile and productive land were degraded annually worldwide.
- **Annual solid waste currently exceeds 2 billion tonnes** and, given current trends, is projected to increase to 3.8 billion tons by 2050.

■ **These environmental crises are causing substantial economic and social damage,** including to infrastructure, transport, and basic services, harming jobs, livelihoods, economic growth and security, and undermining human health and well-being, food, energy and water security for all people, with disadvantaged populations being disproportionately affected. These crises are already reversing socioeconomic development achievements by increasing poverty and inequalities, and decreasing life expectancy. They can no longer be viewed as simply environmental issues; they are also economic, development, governance, security, social, moral, and ethical issues.

■ **Most of the internationally agreed (or adopted) environmental goals and targets are unlikely to be met with existing policies and practices,** including those from the UNFCCC, Paris Agreement, the CBD, Kunming-Montreal Global Biodiversity Framework, and the UNCCD Strategic Framework 2018-2030, as well as World Health Organization (WHO) pollution standards. For example, almost all dimensions of biodiversity are projected to worsen, moving the world away from achieving the 2050 biodiversity targets of the Kunming-Montreal Global Biodiversity Framework. Depending on if and how current policies and nationally determined contributions are implemented, the global mean temperature is projected to increase by 2.4–3.9°C above pre-industrial levels this century. These projections fall well short of achieving the long-term temperature goal of the Paris Agreement, which is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

■ **Rising global resource consumption, including materials, energy, water and food, is primarily driven by increasingly resource-intensive lifestyles, especially in high-income countries, along with economic growth, demographic change and urbanization.** This increasing demand is being met using environmentally unsustainable production and consumption in the context of the current economic, financial, and governance systems, which themselves are unfit to meet these challenges sustainably. These lead to the ever-increasing pressures from land-use change, resource use and exploitation, emissions of greenhouse gases and pollutants, and invasive alien species. Collectively, these are the underlying causes of the interconnected global environmental crises of climate change, biodiversity loss, land degradation and desertification, and pollution and waste.

<sup>1</sup> A tipping point is a critical threshold beyond which a system re-organizes, often abruptly and/or irreversibly.

2

Transformative solution pathways are possible – whole-of-government and whole-of-society approaches at scale and pace can enable environmental goals to be met and provide social and economic benefits.

■ **Achieving the internationally agreed (or adopted) environmental goals and targets requires transformation of the economic and financial, materials/waste, energy, and food systems – the human systems – and transformation of the way the environmental system is managed for sustainability and resilience.**

■ **The GEO-7 scenario analysis shows that internationally agreed (or adopted) environmental goals can still be achieved, but will require unprecedented action.**

There are multiple pathways to do so, with benefits for people and planet. This requires combining coherent and coordinated transformative solutions within and across systems – economic and financial, materials/waste, energy, food, and environment – and well-being and environmental goals, to minimize potential trade-offs and take advantage of synergies.

■ **A transformation framework is essential for the formulation and strategic implementation of solution pathways across systems, regions and scales.**

Solution pathways need to focus on system-wide transformations, identifying what needs to be developed, phased out, avoided, and preserved. They should articulate near- and long-term solutions, anticipate and reduce uncertainties, involve a plurality of actors and perspectives, and explicitly address the political nature of change.

■ **There is a rapidly narrowing window of opportunities to successfully embrace and implement the solutions needed to transform the systems.** Governments and intra- and intergovernmental organizations, working with the private sector, financial institutions, academia and civil society, need to:

- co-produce policies and solution pathways;
- develop and deploy appropriate technologies;
- provide the necessary level of financing; and
- motivate and accelerate institutional, social and cultural changes.

These need to be achieved at an unprecedented pace, scale, level of integration, and depth, while reforming existing powers, such as vested interests, and economic structures that perpetuate inequalities. While some progress is being made, it is not occurring at the pace and scale needed.

■ **The economic benefits of action exceed the costs of transformation, as the damages from the global environmental crises will become increasingly severe over the coming decades.** The overall macroeconomic annual benefits of transformation are estimated to begin around 2050 and increase to approximately US\$20 trillion per year by 2070, and over US\$100 trillion per year by 2100, accounting for more than 25 per cent of projected global GDP in 2100.

■ **Achieving environmental goals, alongside social and economic benefits, requires a whole-of-government and whole-of-society approach.** This involves identifying and capitalizing on solutions that benefit multiple systems simultaneously, and are just and equitable, ensuring participation of all agents of change, such as actors and networks of actors. It also involves changing attitudes and behaviours, reforming existing national and multilateral governance structures and taking into account diverse world views and knowledge systems.

■ **Indigenous Peoples' and local communities' knowledge, values, and ways of being contribute to transformations towards sustainable and just futures.** They offer concepts of human-nature relations based on ethics of care and ways of organizing economies that take a holistic approach to well-being. Drawing on sustainable stewardship practices and adaptation strategies, Indigenous Knowledge and Local Knowledge can provide concrete guidance on actions relating to care of territories and life, as well as in relation to energy, food, governance and economies.

3

Transformation of the economic and financial systems will unlock transformations in the materials/waste, energy, and food systems, and improve environmental management.

■ **Transformation of the economic and financial systems is a prerequisite for transforming the other systems, including:**

- phasing out and repurposing environmentally harmful subsidies, of about US\$1.5 trillion per year from energy, food and mining;
- internalizing social and environmental externalities into the prices of goods and services of about US\$45 trillion per year from energy and food systems;
- moving beyond traditional measures of economic activity, and specifically gross domestic product (GDP) as it is conventionally measured, by including natural capital and human well-being in decision-making; and
- aligning financial flows with international environmental goals to transform the energy, material/waste and food systems.

This would include delivering the estimated US\$6–7 trillion per year of investment<sup>2</sup> needed to reach net zero greenhouse gas (GHG) emissions globally by 2050, as well as addressing an estimated gap of US\$700 billion per year for implementing the Global Biodiversity Framework. This could be done while taking into account the needs of the poorest and most vulnerable parts of the population through compensatory mechanisms.

■ **Transforming the materials/waste system requires implementing a global circular economy, including:**

- designing out waste from production and consumption (e.g., in energy, food and water systems);
- shifting investments to deliver circularity in the economy, production and consumption;
- developing effective markets for secondary materials;
- creating a transparent global trade system for circular goods and services; and
- inclusive societal transformation towards sustainable lifestyles.

This can significantly reduce waste generation and the economic losses, exceeding US\$8.1 trillion per year, associated with environmental pollution. It can also help avoid significant increases in extractive activities for critical energy transition minerals, offering clear environmental co-benefits and addressing other issues, including the global plastic pollution crisis.

■ **Transforming the global energy system requires a multifaceted approach that simultaneously addresses energy access and poverty and aligns with internationally agreed (or adopted) environmental goals and targets, including:**

- diversifying energy production, including increasing use of renewable energy technologies, e.g., solar and wind, while simultaneously accelerating the phasing out of unabated fossil fuels;
- electrifying final energy services in transport, industry, housing and agriculture
- promoting efficient production and distribution;
- incentivizing demand-side management practices; and
- ensuring the sustainability of critical energy transition minerals.

<sup>2</sup> This represents about 6 or 7 per cent of 2025's GDP.

