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Scholarship 2026
Geography

RESOURCE BOOKLET

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EMERGING GLOBAL GEOGRAPHIC CHALLENGES AND POTENTIAL SOLUTIONS

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SECTION A: GEOGRAPHIC CHALLENGES

World Economic Forum predictions – future global risks

The World Economic Forum (WEF) surveyed over 900 experts to determine the most critical short- and long-term risks facing the world. Experts identified misinformation and disinformation as the top risk for 2027, with artificial intelligence (AI)-based content creation tools threatening to proliferate fake news and misleading content.

The impacts of climate change are becoming more evident, with frequent extreme weather events ranked as the second-most impactful risk for 2027. These include wildfires, floods, hurricanes, and other natural disasters that leave lasting economic and social damage. Extreme weather events are projected to become even more concerning by 2035, alongside other environmental risks such as habitat change and biodiversity loss. These are indirect impacts of climate change and rising global temperatures.

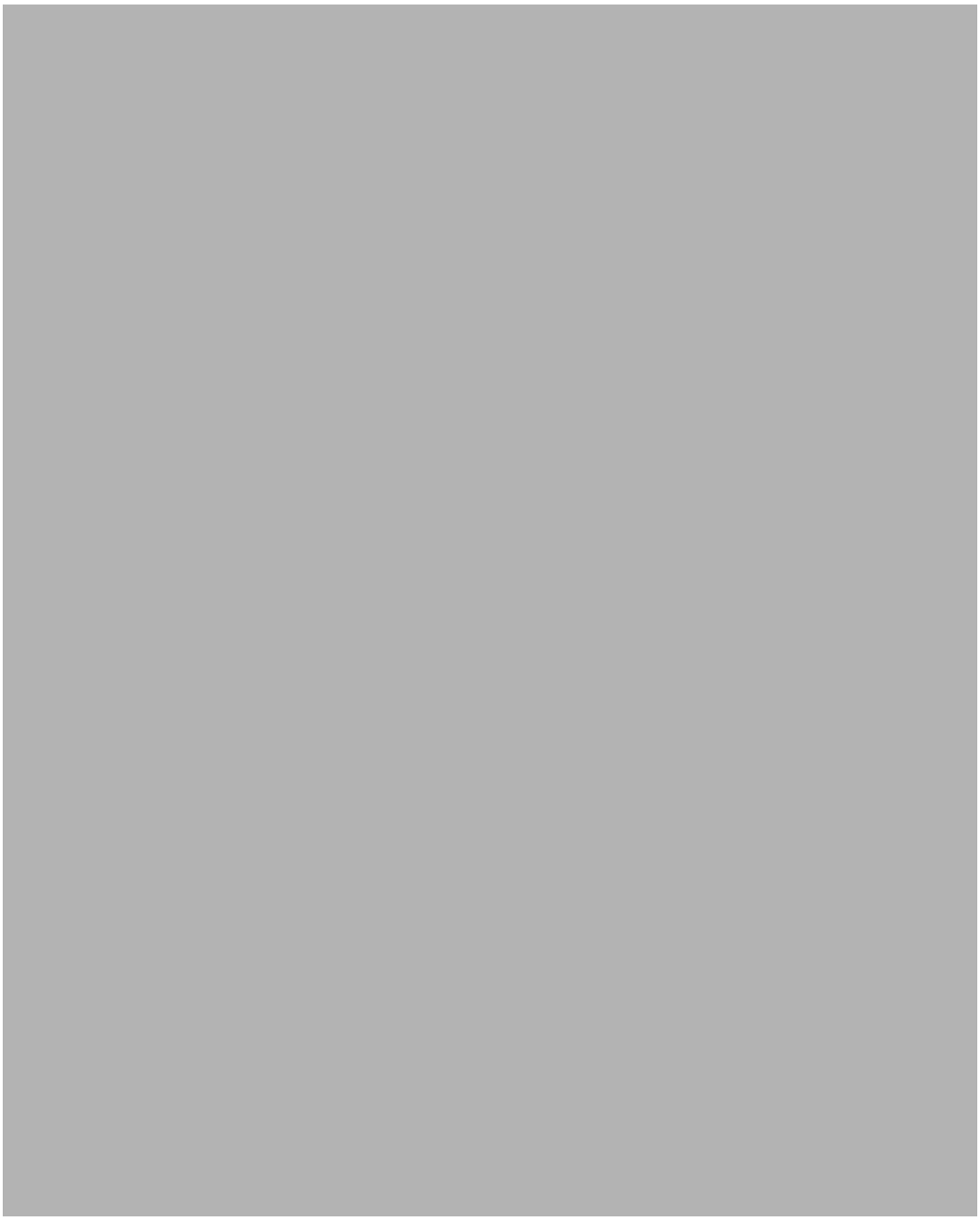


Figure 1: Critical short- and long-term risks facing the world.

2025 Geopolitical Risk Map – what will emerge in the future?



Figure 2: The risk rating matrix considers the potential impact on organisations and / or individuals due to terrorism, political violence, localised conflict and war, political risk, criminal risk, kidnap, ransom, detention, and extortion.

One of the defining features of the 2025 risk landscape was the return of great power rivalry in a fragmented, multipolar world. The ongoing strategic competition between the United States of America, China, and Russia created overlapping zones of tension – in Eastern Europe, the Indo-Pacific, and the Middle East.

Fragile ceasefires, proxy conflicts, and shifting alliances have made it increasingly difficult for companies and governments to anticipate conflict escalation. At the same time, mid-tier powers like Türkiye, Iran, and India are playing more assertive roles, further complicating regional balances of power. The increase in hybrid warfare tactics, including disinformation, economic coercion, and cyberattacks, highlights the blurring lines between civilian and military domains.

Finite resource extraction and impacts

There are only limited, non-replenishable supplies of minerals, metals, and fossil resources on our planet. As population growth gives rise to increasing demand for industrial and consumer goods worldwide, the availability of non-renewable natural resources is dwindling. Furthermore, the quality of natural resources such as water, air, and soil may become permanently damaged as a result of commercial activities. Heightened consumption and unsustainable production are depleting natural sources of these life-supporting essentials.

Extraction of the Earth's natural resources tripled in the past five decades, related to the massive build-up of infrastructure in many parts of the world and the high levels of material consumption, especially in upper-middle and high-income countries. Material extraction is expected to rise by 60% by 2060 and could derail efforts to achieve not only global climate, biodiversity, and pollution targets but also economic prosperity and human well-being, according to a 2024 report published by the United Nations Environment Programme (UNEP).

> "The triple planetary crisis of climate change, nature loss, and pollution is driven from a crisis of unsustainable consumption and production."
>
> *–Inger Andersen, Executive Director of UNEP*

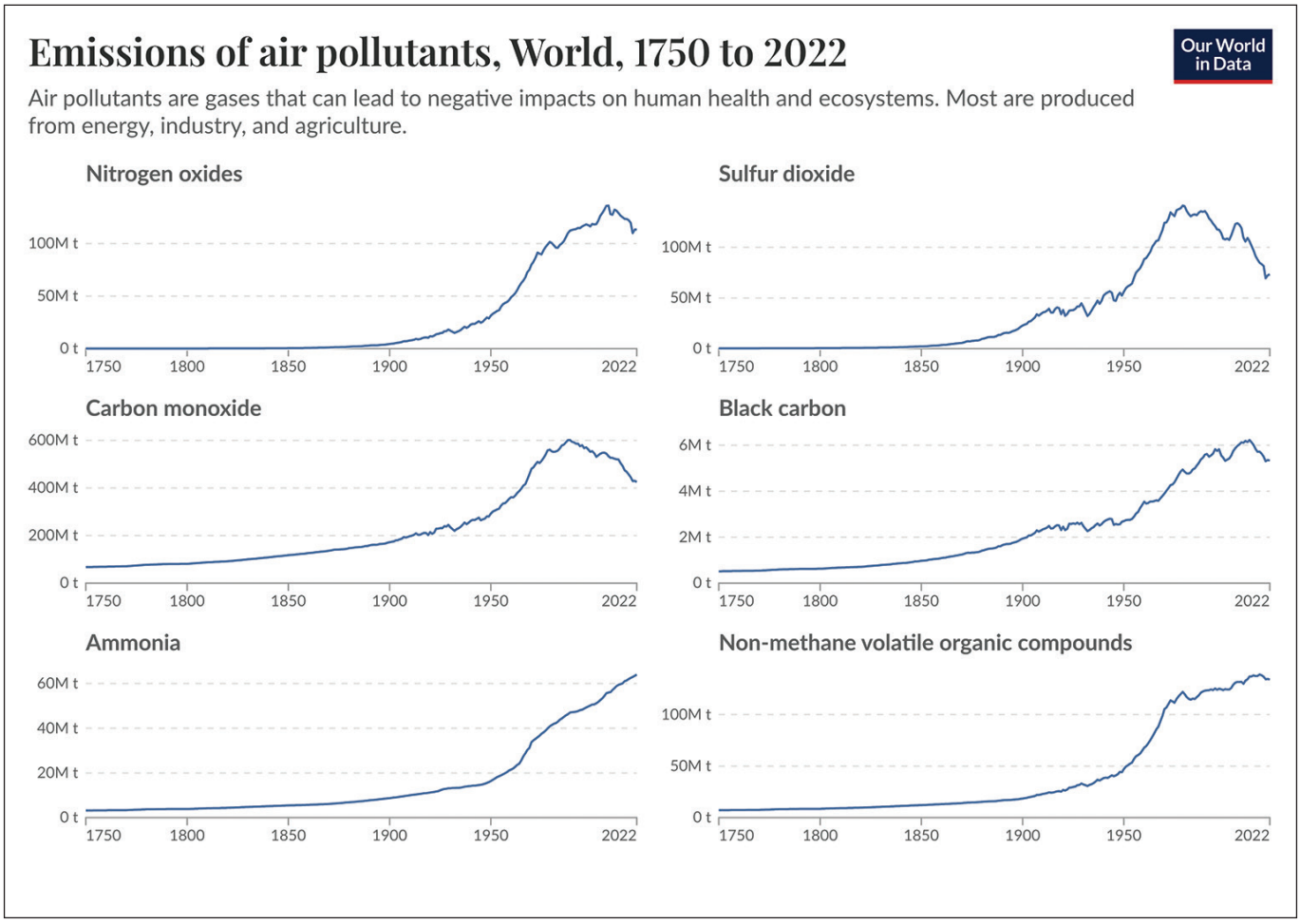


Figure 3: Global air pollution trends.

The business model of failure

Planned obsolescence isn't just an unfortunate by-product of innovation, it's an economic strategy. This relentless turnover of goods fuels growth of course, but it also creates massive inefficiencies, from wasted resources to increased security risks.

Hardware manufacturers design products with finite lifespans to maximise sales, while software vendors push update cycles that erode compatibility with older systems. The bigger issue here isn't just the inconvenience of planned obsolescence – it's the lack of accountability from tech companies driving these cycles. Products aren't designed for longevity – whether it's software updates forcing out old hardware, cloud platforms discontinuing services, or proprietary systems making repairs impossible.

Food scarcity

There are limits to Earth's capacity to feed humanity. Even if we use available resources at maximum efficiency, the world's farmland could not support more than 10 billion people, according to former Harvard sociobiologist, Edward O. Wilson.

Wilson argued, "If everyone agreed to become vegetarian, leaving little or nothing for livestock, the present 1.4 billion hectares of arable land would support about 10 billion people. There is little room for flexibility. The constraints of the biosphere are fixed."



Figure 4: India ranked 102 out of 123 countries in the 2025 Global Hunger Index, with the growth of 32.9% of children under five classified as stunted.

Supporting this viewpoint, Julian Cribb, author of *The Coming Famine*, states shortages of water, land, and energy, combined with the increased demand from population and economic growth, will create a global food shortage by around 2050. Lack of technology and knowledge will add to the crisis Cribb says, arguing that it's happening fast: it is arriving even faster than climate change.

Climate change impact predictions

The World Economic Forum's *Global Risks Report 2025* starkly outlines how extreme weather events have solidified their place among the top global risks. The global cost of climate change damage is estimated to be between US$1.7 trillion and US$3.1 trillion per year by 2050.

This includes the cost of damage to infrastructure, property, agriculture, and human health. This cost is expected to increase over time as the impacts of climate change become more severe. Developing countries are at greatest risk from the economic impacts of climate change, with the United Nations estimating that developing countries alone will require US$187–359 billion annually by 2030 to adapt effectively, yet current funding levels are nowhere close.

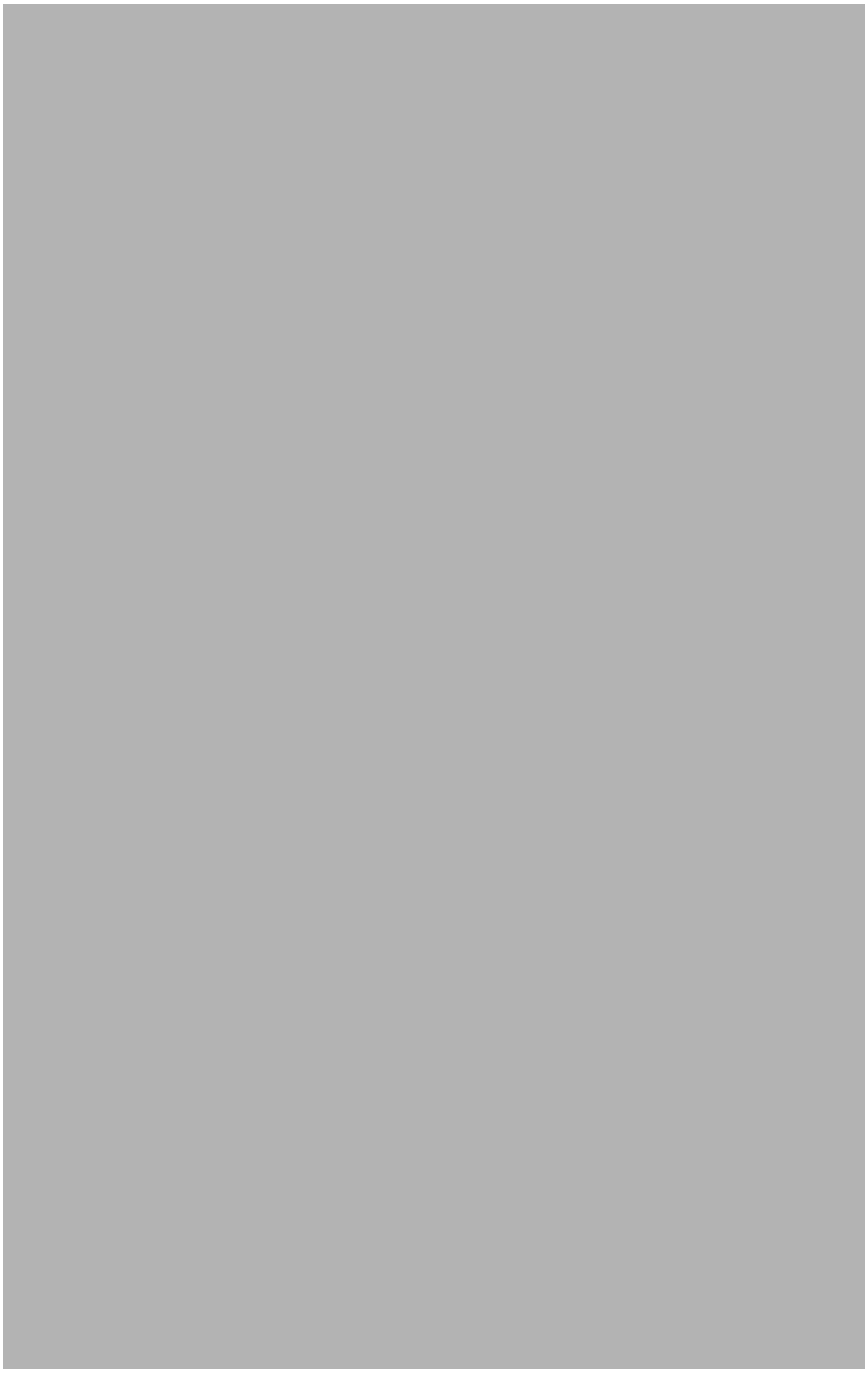


Figure 5: Intergovernmental Panel on Climate Change (IPCC) 2023 report findings support the World Economic Forum's *Global Risks Report* concerns.

Sea level rise predictions



Figure 6: Anticipating future sea levels.

Scientific organisations like the Intergovernmental Panel on Climate Change (IPCC) are publishing sea level rise projections with increasing levels of confidence. In its 2019 report, the IPCC projected (Figure 6 above) 0.6 to 1.1 metres of global sea level rise by 2100 (or about 15 millimetres per year) if greenhouse gas emissions remain at high rates. Under the worst-case scenario, by 2300, seas could stand as much as 5 metres higher.

The effects of global sea level rise are profound and multifaceted, impacting both human and natural systems. Rising seas threaten infrastructure, including roads, bridges, and buildings, leading to increased costs for maintenance and repair. As coastal flooding becomes more frequent and severe, it will exacerbate erosion and cause saltwater intrusion into freshwater sources, which can compromise drinking water supplies and agricultural productivity.

Bangladesh, China, India, and the Netherlands were singled out by the United Nations in 2023 as being at high risk from rising sea levels, with nearly 900 million people living in low-lying coastal areas in acute danger. NASA says the east coast and Gulf coast of the United States, as well as Asia and islands, are at high risk from the rising ocean. But it's not just the changing sea level that's a threat, it says. Storm surges are amplified by sea level rise, causing them to hit higher water levels and allowing the surges to reach further inland.

Climate refugee predictions

Climate migration is devastating people's lives. An annual average of 21.5 million people were forcibly displaced each year by weather-related events – such as floods, storms, wildfires, and droughts – between 2008 and 2016, according to the Internal Displacement Monitoring Centre. This figure reached a record 32.6 million in 2022.

The Institute for Economics & Peace (IEP), an international think tank, expects this number to surge. It predicts that 1.2 billion people could be displaced globally by 2050 due to the rise in extreme weather and natural disasters.

Speaking at the Clinton Global Initiative during Climate Week New York City 2024, Amar Rahman, Global Head of Climate and Sustainability Solutions at Zurich Resilience Solutions stated, "extreme weather knows no borders".

Rahman said climate migration is often exacerbated by a string of interconnected risks that can cause a domino effect. "When temperatures rise in a country, for instance, it can reduce water availability and water quality. This may increase the spread of disease and raise the likelihood of drought leading to crop failures that will reduce incomes and food supplies. All this can potentially lead to social disruption and political instability."

Biodiversity loss

Biodiversity sustains human life and underpins our societies. Yet every indicator that tracks the state of nature on a global scale shows a decline. Over the 50 years from 1970–2020, the average size of monitored wildlife populations shrank by 73%, as measured by the Living Planet Index (LPI). This is based on almost 35,000 population trends and 5,495 species of amphibians, birds, fish, mammals, and reptiles. Freshwater populations suffered the heaviest declines, falling by 85%, followed by terrestrial (69%), and marine populations (56%).



Figure 7: Illustration of the change in wildlife populations with and without increased conservation efforts.

Over the last 10,000 years, the world has lost one-third of its forests – an area twice the size of the United States. Half of the loss occurred in the last century.

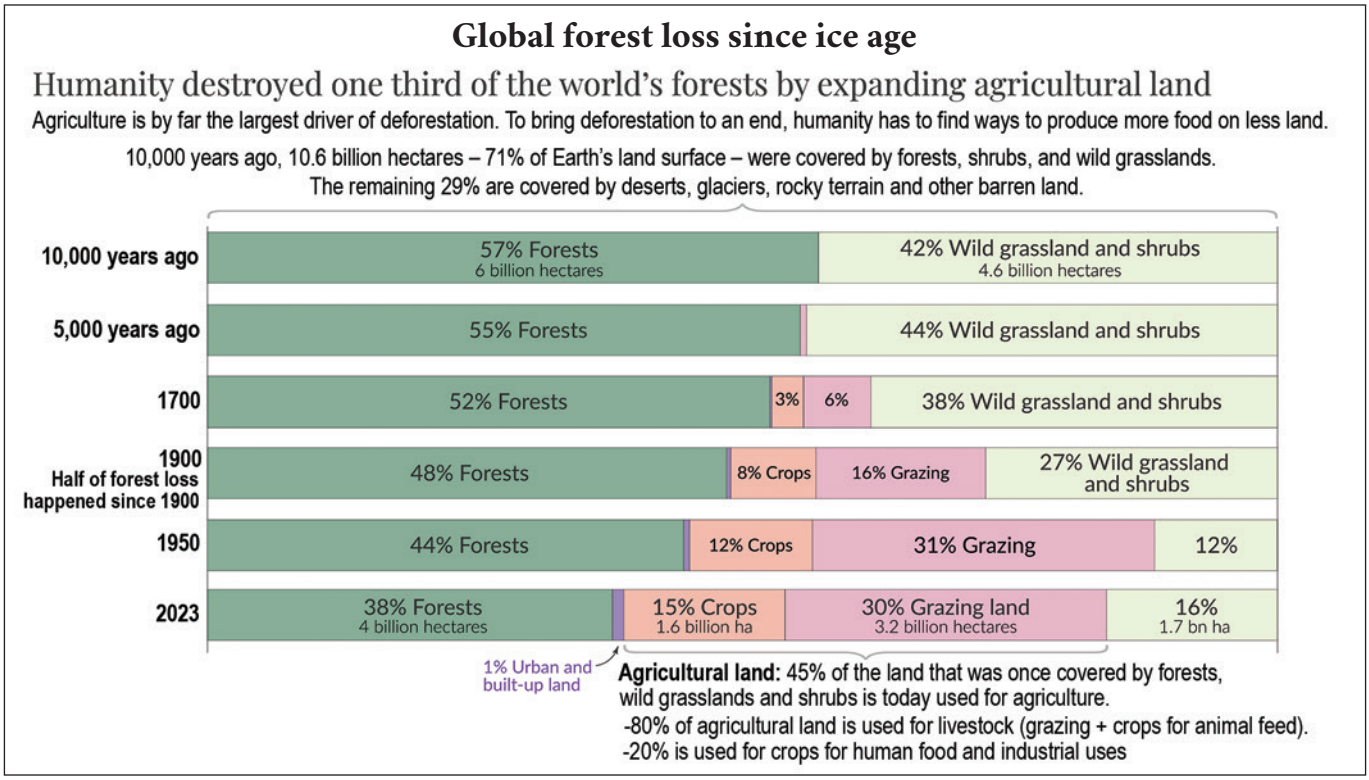


Figure 8: Loss of forests to agricultural land.

Inequality – share of the wealth

Over the past four decades, global production, as measured by GDP, has increased more than threefold. But the vast majority of this additional output has been captured by the rich. Figure 9 shows that the richest 1% have claimed 54% of total gains from growth, while the richest 5% have claimed 70%. Figure 10 highlights the resulting income inequality within countries.



Figure 9: Global income growth. MER refers to market exchange rate.



Figure 10: Income inequality by country.

Misinformation and disinformation



The spread of false and misleading information poses significant risks to the well-being of people and society.

While such content is not necessarily illegal, it can contribute to polarisation, jeopardise the implementation of policies, and undermine trust in democratic institutions and processes.

Figure 11: The threat of misinformation by country.

Artificial intelligence future impacts

For the people most immersed in the tech sector, it's hard to think of a more controversial topic than the ultimate impact of AI on society. By eventually empowering machines with a level of superintelligence, there are many different possible outcomes ranging from Kurzweil's technological singularity (a theoretical tipping point when technological growth becomes uncontrollable and irreversible, transforming human civilisation) to the more dire predictions popularised by Elon Musk. Despite this wide gap in potential outcomes, most technologists do agree on one thing: AI will have a profound impact on society and the way we do business.

The expansion of AI, digital infrastructure, and surveillance systems brings not only opportunity but exposure. Cyberattacks on critical infrastructure, disinformation campaigns, and AI-driven fraud are among the fastest-growing non-traditional global threats. State-sponsored and criminal actors alike are targeting health systems, transportation networks, and supply chains. Meanwhile, the geopolitical battle over data sovereignty and digital governance is intensifying, with diverging standards between blocs – particularly in the United States, European Union, and China.

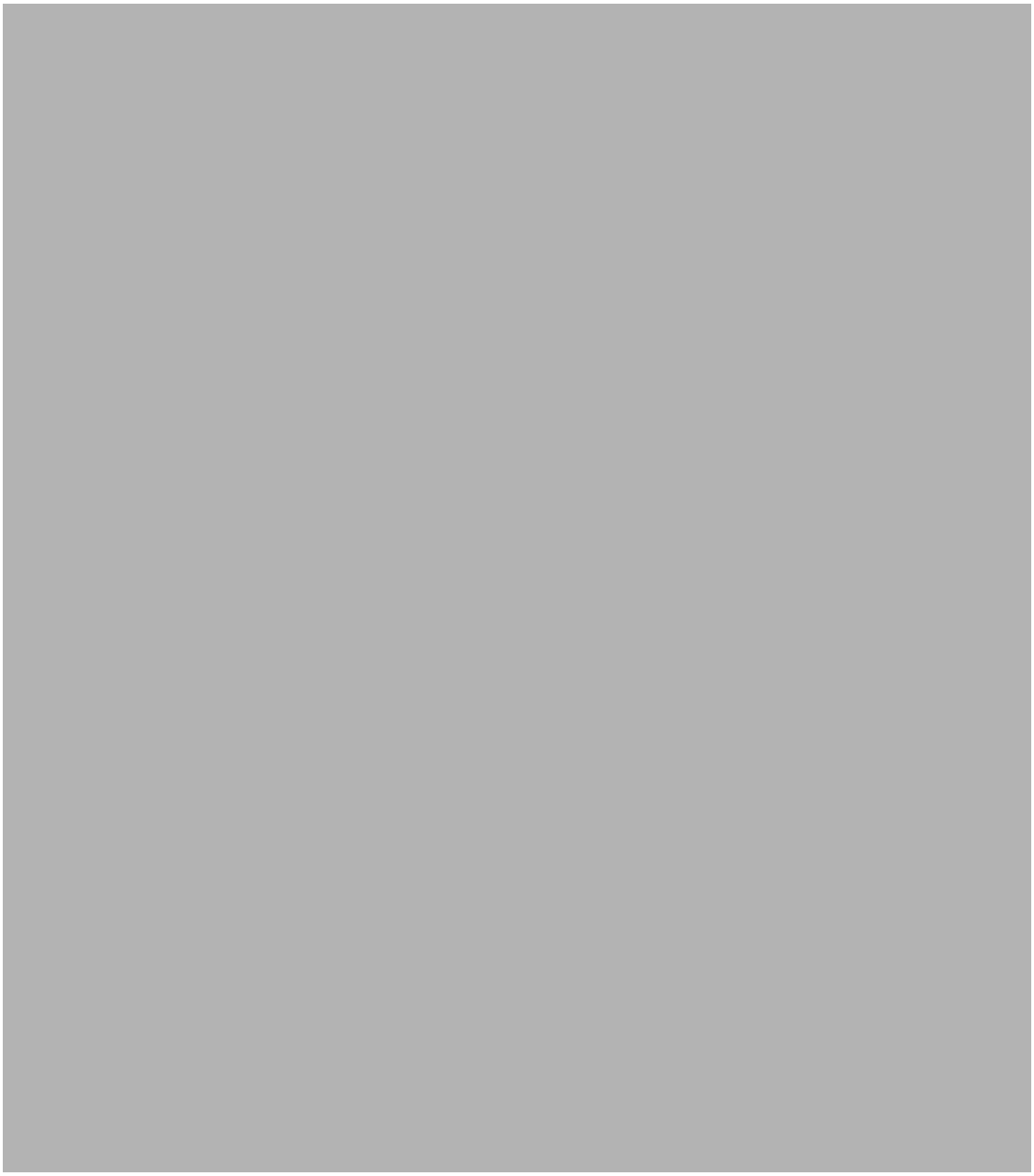


Figure 12: Predicted economic benefits of AI.



Figure 13: AI economic benefits by region.

Demographics – aging population and falling fertility rates

Falling fertility rates and aging populations present a dual challenge: a shrinking workforce and pressure on social systems, offset by potential benefits like reduced environmental strain and lower spending on young people. Future impacts include a smaller labour pool, a higher dependency ratio of older to younger people, and increased demand for healthcare and pensions.

The World Health Organization (WHO) outlined 'global aging' concerns in a 2025 report. By 2030, one in six people in the world will be aged 60 or over and number 1.4 billion, an increase from 1 billion in 2020. By 2050, the world's population aged 60 and older will have doubled to 2.1 billion. The number of people aged 80 or older is expected to triple between 2020 and 2050 to reach 426 million.

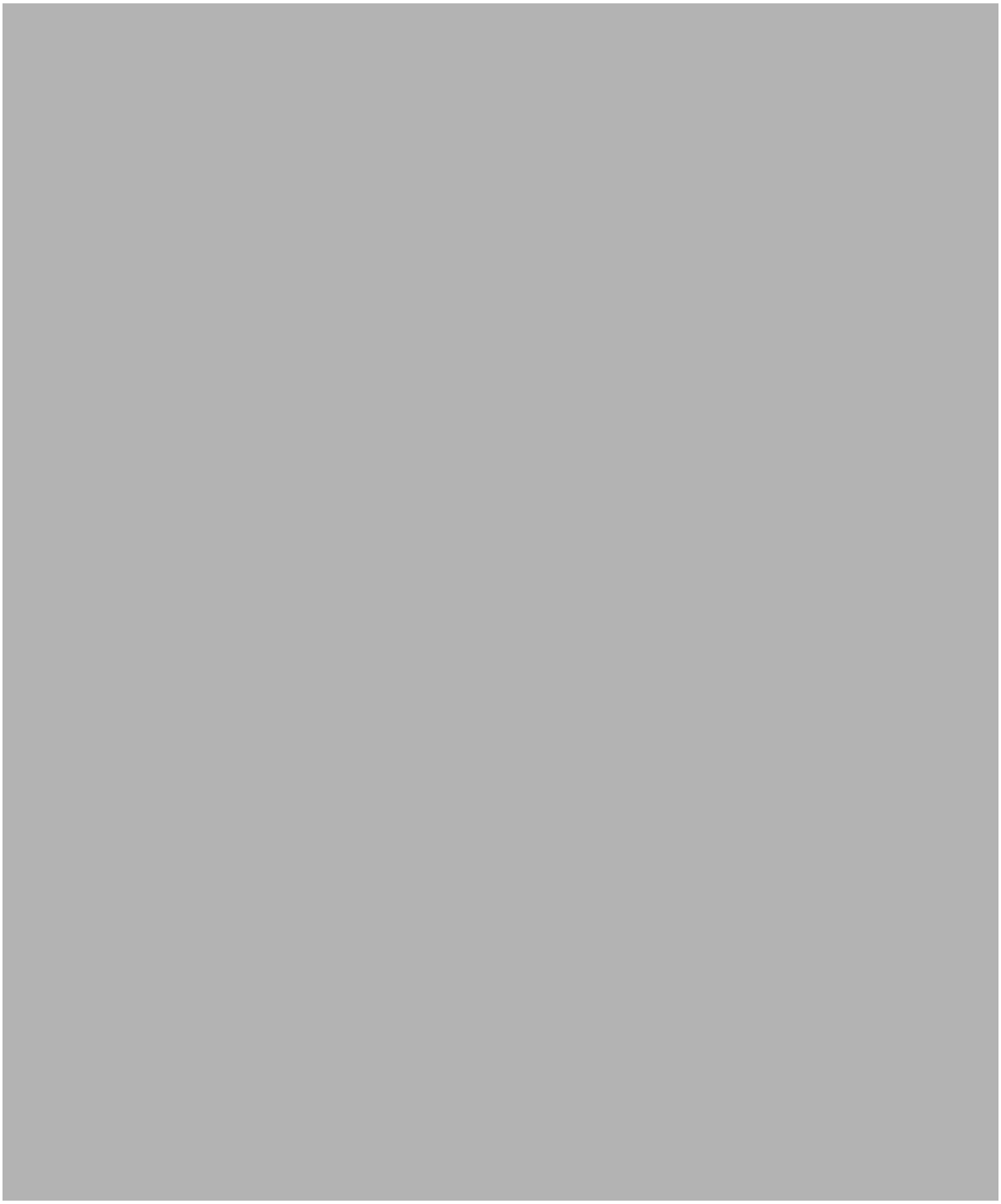


Figure 14: Population age projections to 2100.

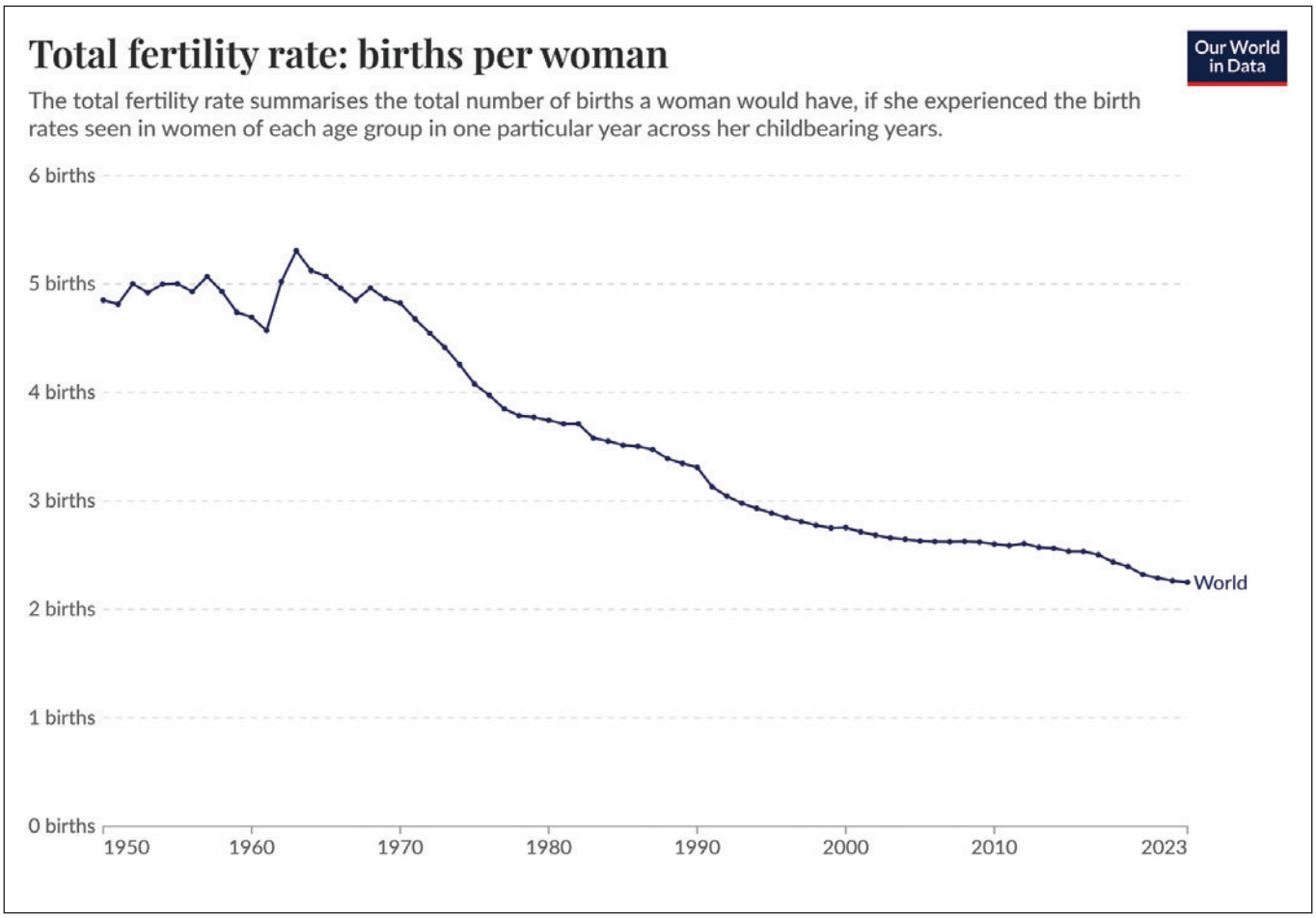


Figure 15: Fertility rates from 1950 to 2023.

SECTION B: PERSPECTIVES

Technological perspectives

Technology and innovation

July 2024 was one of the hottest months ever recorded at the time, with global temperatures reaching 1.5°C above pre-industrial levels and heatwaves fuelling tens of thousands of wildfires across Europe and Asia. These events have accelerated efforts to find smarter, technology-driven ways to monitor and reduce the resulting air pollution.

The United Nations Environment Programme (UNEP) is leading this shift by deploying AI-powered data systems and real-time air quality networks to predict pollution spikes and guide emergency responses. Its GEMS Air Network (Global Environment Monitoring System for Air), which now tracks conditions in over 5,000 cities worldwide, allows governments and communities to make faster, evidence-based decisions to protect public health. Through these innovations, UNEP is demonstrating how digital technology and global cooperation can mitigate one of the most dangerous consequences of a warming planet.



Figure 16: Pollution monitoring instruments from NASA, the European Space Agency (ESA), and Korea Aerospace Research Institute (KARI).

AI automation

AI-driven systems predict energy demand and optimise the use of renewable sources, potentially reducing energy waste by up to 10%. For example, Google's DeepMind AI has helped reduce energy usage in its data centres by 40%. Similarly, AI can be utilised for predictive maintenance by spotting which machines need repairs, thereby preventing unexpected breakdowns.

The adoption of AI and automation may ensure lower investment in infrastructure and energy consumption. This can significantly reduce greenhouse gas emissions and conserve resources for a sustainable future. In fact, 77% of companies that wish to adopt sustainable transformation are planning on leveraging AI and automation in their processes.



Figure 17: Uses of AI to help address Earth's challenges.

Economic perspectives

Circular economy

The pressure that the human species exerts on the natural environment through the extraction of materials and generation of waste is widely recognised. The circular economy has emerged as a potential solution to make better use of resources.



Figure 18: The circular economy concept.

The overall aim of the circular economy model is to eliminate waste, circulate products and materials, and regenerate natural systems, creating a continuous flow where waste becomes a valuable resource. It is positioned as a technology-focused concept that can generate economic gains while alleviating pressure on the environment from energy generation, production of products or goods, and waste management.

A key principle of the circular economy is powering these cycles with renewable energy, rather than finite resources. This helps decouple economic activity from the consumption of limited resources.

Planned obsolescence isn't just an unfortunate by-product of innovation, it's an economic strategy. Potential solutions to this within the circular economy framework can be found in regulation of manufacturing.

The EU's Digital Markets Act introduces obligations for interoperability and limits on anti-competitive behaviour that forces unnecessary upgrades. France has introduced repairability scores for electronics, making it easier for buyers to choose longer-lasting products. In the United States, state-level right-to-repair laws have started appearing, forcing manufacturers to provide repair information and parts.

Political perspectives

In recent decades, rapid population and economic growth have improved global living standards but placed immense pressure on the environment through deforestation, pollution, resource depletion, and climate change. Addressing these challenges requires major policy reform to shift towards a more sustainable economy.

A key issue is the continued subsidisation of fossil fuels – both directly through financial support and indirectly through the failure to price their environmental costs. The International Monetary Fund estimates that global fossil fuel subsidies reached US$7 trillion in 2022, about 7% of global GDP, with 60% of this due to unpriced carbon and air pollution.

Correcting these distortions through Pigouvian taxes, which are taxes designed to make polluters pay for the negative externalities or wider social costs they impose on others, could cut global emissions by 43% by 2030 and generate US$3 trillion in additional public revenue – enough to help fund sustainable development goals. However, reform remains politically difficult, as rising energy prices can spark social unrest and public distrust in governments' ability to protect vulnerable groups.

Powerful lobbying by fossil fuel industries – spending over US$2 billion on United States political activities between 2008 and 2018 and outspending clean energy advocates by a factor of 27 – further entrenches the status quo and delays meaningful climate action.

Security, economic, and technological challenges will test the international community. Each of these areas could fuel geopolitical confrontation, but they also present opportunities for cooperation. However, to capture these opportunities for cooperation, stakeholders will need to be innovative by establishing new processes or moulding existing frameworks to meet the current moment.

Most importantly, the correct trajectory will need to have the inclusion of diverse actors, including those from rising powers, those from geographies too often shut out of the multilateral process, and those from the private sector and civil society. Broadly, cooperation will need to be mission-focused and purpose-driven, constructed towards addressing specific challenges. In this way, parties will need to – and history has shown, can – look past differences in pursuit of common benefit.



Figure 19: Trade and economics and security responses to geopolitics.

Indigenous perspectives

Indigenous ways of knowing are shaping climate solutions

Success at the Conference of the Parties (COP) 16 biodiversity summit and COP29 climate summit required ambitious commitments to accelerate action on biodiversity loss and climate change. It also required the adoption of effective, equitable solutions: solutions based not only on science, but also on the wisdom of Indigenous people and local communities who have lived harmoniously with nature for thousands of years.

Indigenous people – groups such as the Sámi in Norway, Sweden, Finland, and Russia, and the Guaraní in Brazil – are among the first and worst affected by climate change, due to their close relationship with the environment and reliance on natural resources.

Indigenous knowledge carries ancient and intergenerational wisdom that is flexible, fluid, and adaptive as it evolves through relationships with the land and other beings. Common principles across these knowledge systems, which some suggest are important in the context of addressing issues, are the concepts of relationality and stewardship which teach that all living things are interconnected and therefore must be respected and cared for.

Researchers at the Prairie Climate Centre work with communities to bring together science

and Indigenous knowledge in climate change research and communication. Through diverse community-led actions – such as community-owned renewable energy projects, land-based education, cross-cultural climate conversations, language revitalisation programmes, and ceremony – Indigenous communities are reconnecting with traditional knowledges, cultures, spiritualities, and lands, and leading solutions that benefit both people and the planet. For example, Montana First Nation is leading a pilot initiative, funded by Aboriginal Affairs and Northern Development Canada, to make homes healthier and more energy efficient by removing mould and installing solar panels and efficient furnaces.

Yet, despite these successes, resistance to large-scale renewable developments persists. Centuries of colonisation have displaced Indigenous people onto lands now targeted for hydropower, wind, and solar projects. Without secure land titles or proper consultation, many communities view new renewable ventures as a continuation of dispossession, rather than a path to justice.

Pacific knowledge leading the climate fight

Guided by the motto "We are not drowning, we are fighting," Pacific innovators are merging traditional wisdom with modern technology to create sustainable solutions.

In Fiji, the *Uto ni Yalo* ("Heart of Spirit") sailing project combines ancient canoe-building methods with solar and wind power, demonstrating how ocean transport can thrive without fossil fuels. Across the islands, community-led voyages and clean-up missions are inspiring others to protect the sea that sustains them.



Figure 20: The *Uto ni Yalo* vessel.

Samoan-New Zealand architect Carinnya Feaunati argues that Indigenous people's deep relationship with nature holds "the main source of information for how we can tackle climate change," if only the world would listen.

University of Canterbury researcher Dr Dalila Gharbaoui believes that modern science alone cannot fully explain or solve the climate crisis. She highlights how Indigenous values – collective action, social networks, and cultural definitions of habitability – provide deeper insights into how communities live with change rather than flee from it.

The Pacific Ocean and Climate Crisis Assessment (POCCA), a partnership between the University of Canterbury and the University of the South Pacific, demonstrates how collaboration between Indigenous knowledge holders and scientists can lead to holistic, people-centred climate policy. Together, they show that traditional practices are not relics of the past but living systems of environmental intelligence. Integrating these with modern science offers one of the most powerful pathways towards a sustainable and equitable global future.

Environmental perspectives

Nature-based solutions play an important role in mitigating environmental challenges through protecting, managing, and restoring ecosystems to reduce carbon and greenhouse gases, while providing co-benefits like biodiversity and resilience.



Figure 21: How nature-based solutions can help mitigate environmental challenges.

SECTION C: SUSTAINABLE SOLUTIONS AND THE ECONOMY

Solutions to emerging global geographic problems often depend on countries adopting more sustainable practices. While sustainable solutions can create economic opportunities, the long-term benefits may be overshadowed by short-term costs. This can lead to the implementation of sustainable solutions being impeded, as governments focus on more immediate economic pressures.

Sustainable development challenge

The complex relationship between economic growth and environmental sustainability remains one of the most pressing global challenges in the context of climate change. Research findings indicate that a 1% increase in GDP leads to a 0.42% rise in CO_2 emissions, highlighting the entrenched environmental costs of growth, particularly in developing and emerging economies. While renewable energy consumption is negatively correlated with emissions, it has yet to achieve the scale required to significantly offset this growth.

Cluster analysis uncovers distinct sustainability profiles, revealing that high-GDP economies continue to face challenges in decoupling growth from emissions, while low-GDP countries show smaller carbon footprints but struggle with scaling renewable technologies.



between growth and sustainability.

These insights demand differentiated policy strategies: advanced economies must accelerate decarbonisation and clean energy innovation, while developing nations should prioritise leapfrogging to renewable technologies with international support.

Temporal variation

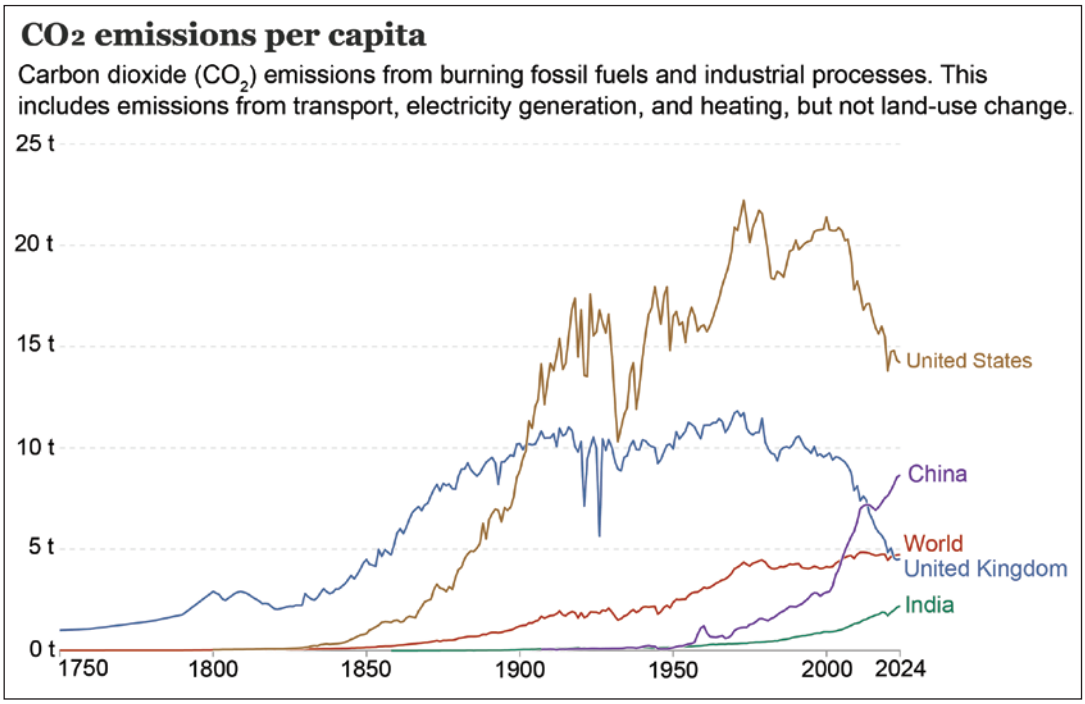


Figure 23: CO_2 emissions from 1750 to 2024.

Global economy

According to a 2023 report from Goldman Sachs, the balance of global economic power is projected to shift dramatically in the coming decades.

More specifically, analysts believe that Asia could soon become the largest regional contributor to world GDP, surpassing the traditional economic powerhouses grouped together in the developed markets (DM) category. Based on these projections, Asia (ex-DM) will represent 40% of global GDP, slightly ahead of DM's expected share of 36%. This would mark a significant shift from 50 years earlier (2000), when DMs represented over 77% of global GDP.

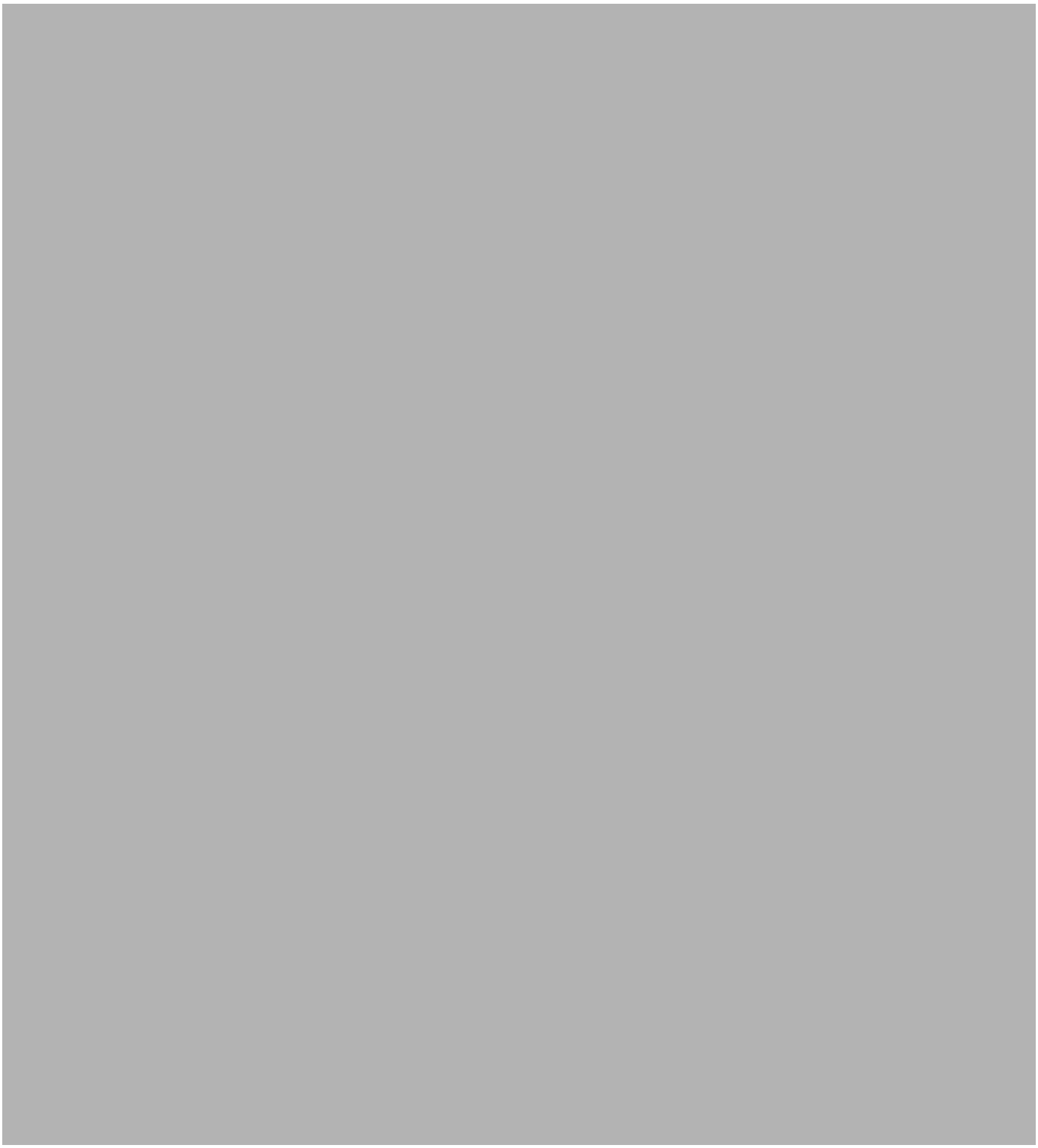


Figure 24: How global GDP will be distributed in 2050, according to projections by Goldman Sachs.

Green economy

The green economy is an economic framework that promotes development while at the same time minimising environmental degradation; it encourages development while sparing the environment. This economy contributes to reaching the aim of sustainable development through its coherent policy actions on a national and international basis. Addressing economic, social, and environmental issues at once can let a nation trace pathways towards securing the future through inclusivity and resilience for generations.

While transitioning to a green economy is important, it may not be feasible or beneficial for all nations, particularly developing countries with limited resources and pressing socioeconomic challenges, as the economy necessitates substantial upfront capital investments in infrastructure and technology that may be beyond public and private budgets.

Changing viewpoints

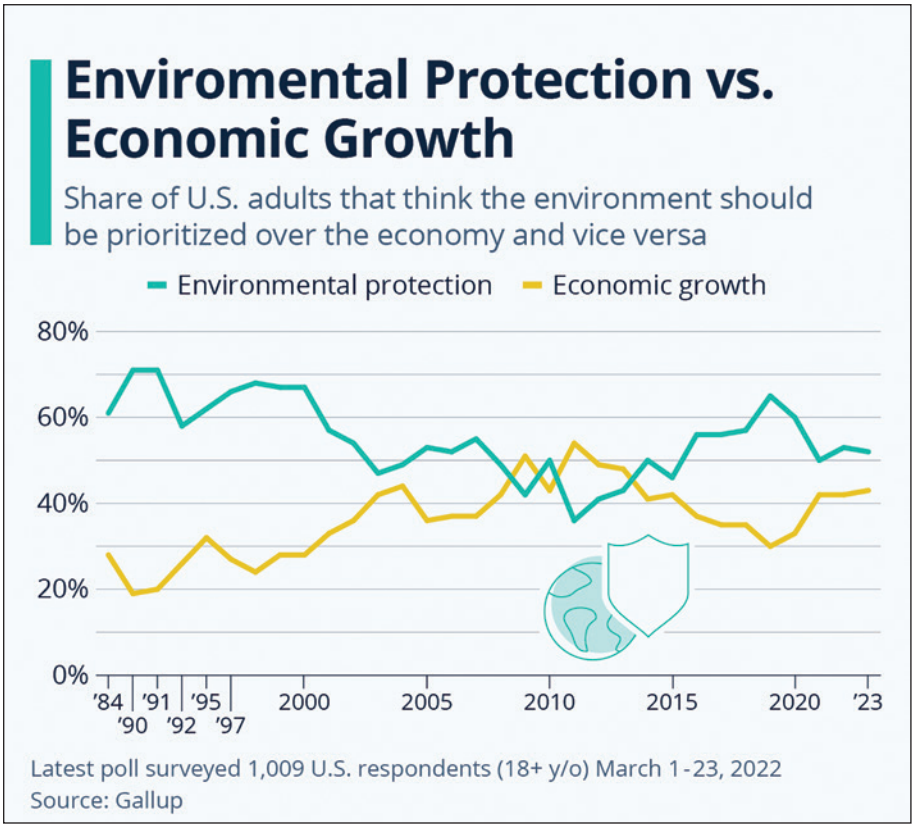


Figure 25: Changes in American adults' opinions on prioritising the environment vs the economy, 1984–2023.

Carbon markets

In November 2025, COP30 aimed to secure a decline in global emissions. Brazil, host of the conference in Belém, proposed a voluntary coalition of countries for integrating carbon market initiatives. This is a market-oriented approach – long favoured by economists – to curbing emissions.

But for meaningful results, major emitting nations would have to embrace the initiative. The hosts proposed curbing carbon emission and global warming resulting from significant 'market failure'; there also need to be agreements that are binding (non-voluntary), at least at sub-regional levels.

In the highly politicised world of climate policy, carbon pricing and carbon markets offer an economically rigorous way forward. Economists view the absence of a price for greenhouse gases as a root cause of runaway global warming. If understood in this way, it should be politically palatable to correct this market failure using market instruments. The pricing can be done either by levying a tax on the carbon content of businesses, as is the case in Singapore and the Canadian province of British Columbia, or by capping emissions in an emission trading system (ETS), as in China and the European Union. Either way, carbon pricing generates revenue, adding to its political and economic appeal.

Sustainable growth

Whether economic growth can be sustained while tackling climate change and staying within wider environmental limits is an area of ongoing debate. Overall, there is strong evidence to suggest that achieving a net-zero-carbon economy can be entirely consistent with continued growth in GDP in the form of 'sustainable growth'.



Figure 26: Kuznets Curve supporting the idea that environmental degradation tends to increase during the early stages of economic growth but decreases in later stages.

Sustainable growth adheres to this principle to achieve environmental and social outcomes that can be sustained in the long run. This requires change on the supply as well as the demand side of production, including a shift towards more responsible consumption, especially among the affluent. It also requires that emissions which are embedded in imported goods and services (i.e. 'consumption emissions') are accounted for, as well as a country's territorial emissions.

It is also important to recognise that stopping economic growth may run counterproductive to tackling issues such as climate change; this is evidenced by recessions in the past slowing or even derailing efforts to adopt cleaner production methods.

Acknowledgements
Material from the following sources has been adapted for use in this assessment:

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