Climate change is undermining nearly all sustainable development goals, says report

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At the half-time point of the 2030 Agenda, the science is clear—the planet is far off track from meeting its climate goals. This undermines global efforts to tackle hunger, poverty and ill-health, improve access to

clean water and energy and many other aspects of sustainable development, according to a new multi-agency report coordinated by the World Meteorological Organization (WMO).

Only 15% of the Sustainable Development Goals (SDGs) on track, says the [United in Science report](link), which makes a systematic examination of the impact of [climate change](link) and [extreme weather](link) on the goals. It illustrates how weather, climate and water-related sciences can advance aims such as food and water security, clean energy, better health, sustainable oceans and resilient cities.

The annual report combines input and expertise from 18 organizations. It is issued ahead of the SDG Summit and Climate Ambition Summit at the United Nations General Assembly.

"2023 has shown all too clearly that climate change is here. Record temperatures are scorching the land and heating the sea, as extreme weather causes havoc around the globe. While we know this is just the beginning, the global response is falling far short. Meanwhile, halfway to the 2030 deadline for the Sustainable Development Goals (SDGs), the world is woefully off-track," says UN Secretary-General António Guterres.

"Science is central to solutions. It is widely understood that weather, climate, and water-related sciences provide the underpinnings for climate action. But it is less recognized how these sciences can supercharge progress on the SDGs across the board," Guterres writes in the foreword.

"At this pivotal moment in history, the halfway mark to achieving the SDGs, the science community stands united in the effort to achieve prosperity for people and the planet," says WMO Secretary-General Prof. Petteri Taalas.

"Groundbreaking scientific and technological advances, such as high-resolution climate modeling, artificial intelligence and nowcasting, can catalyze transformation to achieve the SDGs. And achieving Early Warnings for All by 2027 will not only save lives and livelihoods but also help safeguard sustainable development," he comments.

The report shows, for example, how weather predictions help boost food production and move closer to zero hunger. Integrating epidemiology and climate information helps understand and anticipate those diseases sensitive to climate. And early-warning systems help to reduce poverty by giving people the chance to prepare and limit the impact.

The need for science and solutions is more urgent than ever.

Between 1970 and 2021, there were nearly 12,000 reported disasters from weather, climate and water extremes, causing more than 2 million deaths and US$ 4.3 trillion in economic losses. More than 90% of these reported deaths and 60% of economic losses occurred in developing economies, undermining sustainable development.

Rising global temperatures have been accompanied by more extreme weather. The chance of the annual mean global near-surface temperature temporarily exceeding 1.5°C above pre-industrial levels for at least one of the next five years is 66% and is increasing with time.

So far, there has been very limited progress in reducing the emissions gap for 2030—the gap between the emissions reductions promised by countries and the emissions reductions needed to achieve the temperature goal of the Paris Agreement. Fossil fuel CO_2 emissions increased 1% globally in 2022 compared to 2021 and preliminary estimates from January–June 2023 show a further 0.3% rise.

To get on track to meet the Paris Agreement goals of limiting warming

to well below 2°C and preferably 1.5°C, [global greenhouse gas emissions](#) must be reduced by 30% and 45%, respectively, by 2030, with carbon dioxide (CO_2) emissions getting close to net zero by 2050. This will require large-scale, rapid and systemic transformations.

Some future changes in climate are unavoidable, and potentially irreversible, but every fraction of a degree and ton of CO_2 matters to limit global warming and achieve the SDGs, says the report.

"The science continues to show that we are not doing enough to lower emissions and meet the goals of the Paris Agreement—as the world prepares for the first global stocktake at COP28, we must increase our ambition and action, and we must all do the real work to transform our economies through a just transition to a sustainable future for people and planet," said Inger Andersen, Executive Director of the UN Environment Program.

Key Messages

State of the Science (Intergovernmental Panel on Climate Change, UN Environment Program, WMO, Global Carbon Project, UK Met Office, World Climate Research Program)

- Total [carbon dioxide](#) (CO_2) emissions from fossil fuels increased 1% globally in 2022 compared to 2021. This was primarily driven by growth in oil use as the aviation sector rebounded. Preliminary estimates shows that global fossil CO_2 emissions in January to June 2023 were 0.3% above the same period in 2022.
- There is a 98% chance that one of the next five years will be the warmest on record. The IPCC projects that the long-term warming (averaged over 20 years) may reach the Paris

Agreement level of 1.5°C in the early 2030s.
- Current mitigation policies will lead to estimated global warming of around 2.8°C over this century compared to pre-industrial levels. Immediate and unprecedented reductions in greenhouse gas (GHG) emissions are needed.

SDG 2—Zero Hunger (Food and Agriculture Organization of the United Nations)

- It is estimated that nearly 670 million people may face hunger in 2030, in part due to more extreme weather events that disrupt each pillar of food security (access, availability, utilization and stability).
- Weather-, climate- and water-related sciences
- Global investments are needed in weather-, climate- and water-related sciences and services along agrifood value chains as they enable farmers to make decisions—for instance on crops and planting—that enhance food and nutrition security.
- Early warnings are crucial to enabling anticipatory action to protect agricultural livelihoods and identify potential areas of crop failure that may lead to emergencies.

SDG 3—Good Health and Well-being (WMO and World Health Organization)

- Climate change and extreme events like heat waves are projected to significantly increase ill health and premature deaths, according to the IPCC. Rapid urbanization puts more people at risk. For example, air pollution is a major urban threat to health and is associated with nearly seven million premature deaths annually.
- Transdisciplinary research is fundamental to analyzing,

monitoring and addressing climate-sensitive health risks and impacts on the health sector. The integration of health and epidemiological data with climate and weather information can inform policy on climate-sensitive communicable diseases (such as malaria and dengue) and non-communicable diseases.
- Scaling up investments in climate-resilient and low-carbon health systems, and progress towards universal health coverage are critical for the achievement of SDG 3

SDG 6—Clean Water and Sanitation (WMO and UN Water)

- Climate change is exacerbating water-related hazards like floods and droughts. Changes in precipitation patterns, evaporation rates and water storage pose significant challenges for managing water resources sustainably.
- More than 60% of countries have inadequate and declining hydrological monitoring capabilities. However, scientific and technological advances, such as drones, artificial intelligence (AI) and space technology, provide opportunities for data-driven integrated water management practices and policies.
- More scientific collaboration, financial investments and data and information exchange will be key to make informed decisions to accelerate implementation of SDG 6.

SDG 7—Affordable and Clean Energy (Sustainable Energy for All)

- Extreme weather events and climate change threaten the achievement of SDG 7 by changing energy supply capability and demand, making the clean energy transition more unpredictable and potentially more expensive.

- More timely and accurate weather-, climate- and water-related data, science and services will improve energy planning and operations. Big data and [artificial intelligence](#) offer potential for enhanced energy system operation.
- Challenges remain in uneven and/or low data quality and limited availability and affordability of data and services.

SDG 11—Sustainable Cities and Communities (WMO and UN Habitat)

- Cities account for about 70% of global greenhouse gas (GHG) emissions and are home to more than half of the global population. They are vulnerable to rising sea levels and storm surges, heat waves, extreme precipitation and flooding, drought and water scarcity, and air pollution.
- Integrated urban weather, climate, water and environmental services, grounded in best-available science, are helping cities achieve SDG 11.
- High-resolution observations, forecasting models and multi-hazard early warning systems are the fundamental basis for integrated urban services.

SDG 13—Climate Action (WMO, Green Climate Fund, UN Climate Change)

- Climate change has caused widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere, which threaten to reverse progress towards achieving all the SDGs.
- Weather-, climate- and water-related science underpin ambitious [climate action](#) and the mobilization of climate finance, particularly in lower-income countries. A new Global Greenhouse Gas Watch initiative is being rolled out to support

mitigation.
- Stakeholder engagement, through means such as citizen science, is vital.

SDG 14—Life Below Water (UNESCO Intergovernmental Oceanographic Commission)

- Climate- and human-related impacts are threatening our oceans, affecting marine ecosystems and the communities that rely on them for food and livelihood security.
- Climate-related ocean science such as ocean acidification observations enhances our understanding of climate impacts on the ocean and contributes to strategies for sustainably managing and protecting marine ecosystems.
- The UN Ocean Decade provides an unprecedented opportunity to mobilize the scientific community and accelerate ocean-related science

SDG 17—Partnerships for the Goals (WMO)

- Half of countries report not having multi-hazard early warning systems (MHEWSs) in place and, where they do exist, there are significant gaps in coverage.
- Weather-, climate- and water-related sciences underpin effective MHEWSs by enhancing the physical understanding of hazards, growing the understanding of the associated risks and impacts, and enabling the detection, monitoring and forecasting of hazards.
- Partnerships across diverse stakeholders, including the weather, climate and water scientific communities, are essential to deliver Early Warnings for All and achieve the SDGs.