

## WMO 2023 REPORT: CLIMATE CRISIS SPARKS BILLIONS IN LOSSES FROM EXTREME EVENTS

By  
**Mir Sher Baz Khetran**  
Research Fellow

Centre for Strategic Perspectives (CSP), ISSI

Edited by  
**Dr Neelum Nigar**

April 5, 2024

*(Views expressed in the brief are those of the author, and do not represent those of ISSI)*



### Introduction:

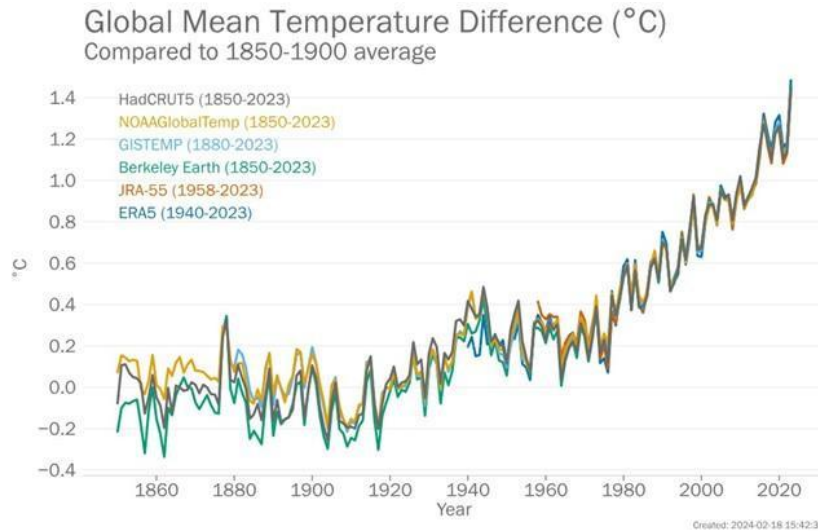
In a new report unveiled by the World Meteorological Organization (WMO), it was revealed that records for greenhouse gas levels, surface temperatures, ocean heat and acidification, sea level rise, Antarctic Sea ice cover, and glacier retreat have not only been surpassed but often shattered. The WMO State of the Global Climate 2023 report paints a dire picture, attributing misery and economic losses in the billions of dollars to heatwaves, floods, droughts, wildfires, and increasingly intense tropical cyclones.<sup>1</sup>

United Nations Secretary-General António Guterres expressed alarm, stating, “Sirens are blaring across all major indicators. Some records aren’t just chart-topping, they’re chart-busting. And changes are speeding up.”<sup>2</sup> WMO Secretary-General Celeste Saulo echoed this urgency, remarking, “Never have we been so close – albeit temporarily at the moment – to the 1.5°C lower limit of the Paris Agreement on climate change. The WMO community is sounding the Red Alert to the world.”<sup>3</sup>

<sup>1</sup> “Climate change indicators reached record levels in 2023: WMO” WMO, March 19, 2024 <https://wmo.int/news/media-centre/climate-change-indicators-reached-record-levels-2023-wmo>

<sup>2</sup> “Leaders ‘Must Step Up and Act — Now’ to Address Climate Change, Says Secretary-General, in Message on Launch of Global Report” UN-Press Release, March 19, 2024, <https://press.un.org/en/2024/sgsm22168.doc.htm>

<sup>3</sup> Huaxia, “WMO issues red alert over record-breaking climate change indicators,” Xinhua, March 20, 2024, <https://english.news.cn/20240320/9c7c9abdc36941ff803327f01371d561/c.html>



**Figure:** Annual global mean temperature anomalies (relative to 1850–1900) from 1850 to 2023.<sup>4</sup>

### Main Highlights of the Report:<sup>5</sup>

- **Greenhouse gases**
  - Observed concentrations of carbon dioxide, methane, and nitrous oxide reached record levels in 2022, with real-time data indicating continued increases in 2023.
  - CO<sub>2</sub> levels are now 50% higher than in the pre-industrial era, contributing to atmospheric heat-trapping and ongoing temperature rise.
- **Temperature**
  - 2023 marked the warmest year on record, with the global average near-surface temperature exceeding the pre-industrial baseline by  $1.45 \pm 0.12$  °C.
  - The ten-year average (2014–2023) global temperature is  $1.20 \pm 0.12$  °C above the 1850–1900 average.
  - Monthly records for warmth were consistently broken globally from June to December, with September 2023 notably surpassing previous records by a significant margin.

<sup>4</sup> “Climate change indicators reached record levels in 2023: WMO” WMO, March 19, 2024  
<https://wmo.int/news/media-centre/climate-change-indicators-reached-record-levels-2023-wmo>

<sup>5</sup> ibid

- **Ocean heat**
  - Ocean heat content reached its highest level in 2023, showing a particularly strong increase over the past two decades.
  - Marine heatwaves, covering 32% of the global ocean on average, became more frequent and intense, with significant negative impacts on marine ecosystems.
- **Sea level rise**
  - Global mean sea-level reached a record high in 2023, reflecting continued ocean warming and ice melt.
  - The rate of sea-level rise in the past decade (2014–2023) is more than double that of the previous decade (1993–2002).
- **Cryosphere**
  - Antarctic sea ice extent hit a record low in February 2023 and remained below average throughout the year.
  - Arctic sea ice extent remained well below normal, with both maximum and minimum extents among the lowest on record.
  - Ice sheets, particularly Greenland and Antarctic, experienced significant mass loss, contributing to global sea-level rise.
- **Extreme weather and climate events**
  - Major floods, tropical cyclones, extreme heat, and drought events had substantial socio-economic impacts across all inhabited continents.
  - Examples include flooding from Mediterranean Cyclone Daniel affecting multiple countries, intense tropical cyclones like Freddy and Mocha, and devastating wildfires in Canada and Hawaii.
  - Prolonged drought persisted in various regions, exacerbating food insecurity and economic losses.

- **Socio-economic Impacts**

- The number of acutely food insecure people globally doubled from 149 million before COVID-19 to 333 million in 2023.
- Weather and climate hazards worsened challenges with food security, population displacement, and vulnerability among affected populations.
- Effective multi-hazard early warning systems and local disaster risk reduction strategies are essential for reducing disaster impacts.

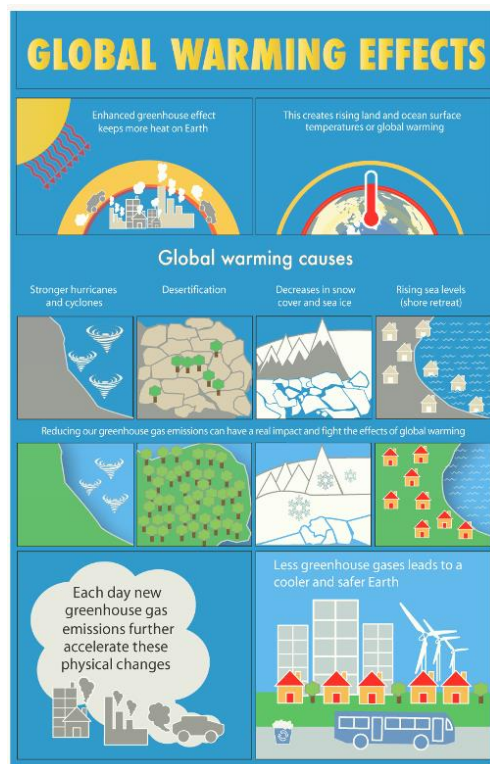
- **Climate Financing**

- Global climate-related finance nearly doubled to USD 1.3 trillion in 2021/2022, but this represents only about 1% of global GDP.
- Annual climate finance investments need to grow by over six times to reach USD 9 trillion by 2030 for a 1.5°C pathway.
- The cost of inaction is estimated at USD 1,266 trillion from 2025-2100, significantly higher than proactive climate investments.
- Adaptation finance remains insufficient, with a widening gap between current funding and the estimated USD 212 billion per year needed up to 2030 in developing countries alone.

### **Impacts of Global Warming**

Global temperature increases result in alterations to weather patterns, amplifying the occurrence and intensity of heatwaves, droughts, and heavy rainfall. These shifts in precipitation can cause extended dry periods or heightened flooding, impacting agriculture, water reservoirs, and infrastructure. The melting of glaciers and ice sheets adds to rising sea-levels, posing threats of erosion, inundation, and saline intrusion into freshwater reserves for coastal communities. Particularly vulnerable are low-lying coastal regions and island nations, facing potential population displacement and habitat loss. Ecosystems face disruption, with habitat shifts, biodiversity loss, and heightened extinction risks for numerous species, often outpacing adaptive capacities. Rising temperatures intensify heat-related ailments, especially among susceptible groups like the elderly

and outdoor laborers. Changes in vector distribution contribute to the spread of diseases such as malaria and dengue fever under evolving climatic conditions.<sup>6</sup>



**Figure:** Global warming causes and impacts<sup>7</sup>

Agricultural productivity suffers from climate variability and extreme weather, leading to crop failures, food scarcities, and price hikes. Precipitation alterations further strain water resources for irrigation, drinking, and sanitation, exacerbating scarcity in many areas. Climate-induced disasters like hurricanes, floods, and wildfires inflict widespread damage on infrastructure, residences, and enterprises, causing economic setbacks. Sectors reliant on natural resources, such as agriculture, fisheries, and tourism, face heightened vulnerability to climate impacts. These disruptions can fuel social tensions and spark conflicts over resources such as water and land. Population displacement due to climate-induced calamities or sea-level rise strains social frameworks, potentially fostering political instability and migration crises.

<sup>6</sup> "State of the Global Climate 2023," WMO, March 19, 2024, <https://wmo.int/publication-series/state-of-global-climate-2023#:~:text=The%20WMO%20report%20confirmed%20that,ten%2Dyear%20period%20on%20record.>

<sup>7</sup> "Infographic - The effects of global warming," What's your impact, Accessed on March 31, 2024, <https://whatsyourimpact.org/infographics/global-warming-effects>

**Conclusion:**

The findings outlined in the report paint a stark picture of the accelerating impacts of climate change across multiple fronts. Greenhouse gas concentrations, including carbon dioxide, methane, and nitrous oxide, continue to rise, driving record levels of atmospheric warming. 2023 emerged as the warmest year on record, with global temperatures exceeding the pre-industrial baseline by a significant margin. Ocean heat content reached unprecedented levels, leading to more frequent and intense marine heat waves and contributing to global sea-level rise. The cryosphere, encompassing Antarctic and Arctic ice sheets, witnessed significant mass loss, exacerbating sea-level rise. Extreme weather events, from floods to tropical cyclones, inflicted substantial socio-economic consequences worldwide, exacerbating food insecurity and population displacement. Despite increased climate financing, the gap between funding and the necessary investments for mitigation and adaptation remains wide, underscoring the urgent need for concerted global action to mitigate the worst impacts of climate change and bolster resilience in vulnerable communities.

In response to these challenges, there is an urgent need for collective action to address global warming and its impacts on society. This requires cooperation and collaboration at local, national, and international levels to reduce greenhouse gas emissions, adapt to changing climate conditions, and build resilience in vulnerable communities. Transitioning to renewable energy sources, promoting sustainable land-use practices, investing in climate-resilient infrastructure, and enhancing climate education and awareness are essential steps in mitigating the impacts of global warming and safeguarding the well-being of present and future generations.