State of Global Climate Report

Why in news?

The World Meteorological Organisation (WMO) has officially confirmed 2023 to be the hottest year on record.

What are the key highlights of the report?

- **Published by**- World Metrological Organization
- **Warmest year**-2023 was the warmest year on record with global average temperatures reaching *1.45°C above pre-industrial levels*.

In 2023, ocean heat content reached its highest level in the 65-year observational record

- **Green House Gases**-Concentrations of the three main greenhouse gases – carbon dioxide, methane, and nitrous oxide – reached record high observed levels.
- **Short term climate drivers**- A prolonged period of La Niña from mid-2020 to early 2023 gave way to El Niño conditions which were well established by September 2023, contributing to the observed rise in global mean sea-surface temperatures during 2023.
- **El Nino impact**- An ongoing El Niño event contributed to below-normal monsoon rainfall in India and record-breaking heat in southern India during January and February.
- **Sea level rise-** The global mean sea level reached a record high, the rate of sea level rise in the past ten years (2014–2023) has more than doubled since the first decade of the satellite record (1993–2002).
- **Cryosphere-** The profound changes seen in the cryosphere clearly illustrate the global scale of climate change.

The cryosphere comprises the frozen parts of Earth – glaciers and ice sheets, sea-ice, snow, and permafrost.

- **Antarctic sea-ice extent-** It has reached an absolute record low in February, the annual maximum extent was around 1 million km² below the previous record low maximum.
- **Loss of ice-**Preliminary data from the global set of reference glaciers for the hydrological year 2022-2023 show they experienced the largest loss of ice on record (1950–2023), driven by extremely negative mass balance in both western North

America and Europe.

Glaciers in Switzerland lost around 10% of their remaining volume in the past two years.

- **Snow cover**- Seasonal snow cover in the Northern Hemisphere has been experiencing a long-term decline in the late spring and summer.
- **Extreme weather**- It lead to severe socio-economic impacts with events such as extreme heat, wildfires, flood etc.,
- **Wildfires**- It affected parts of Hawaii, Canada and Europe which led to loss of life, the destruction of homes and large-scale air pollution.
- **Flood-** It is associated with extreme rainfall from *Mediterranean cyclone Daniel* affected Greece, Bulgaria, Turkey, and Libya with particularly heavy loss of life in Libya.

Tropical cyclone Freddy was one of the world's longest-lived tropical cyclones.

- **Drought-** The Greater Horn of Africa region, which had been experiencing long-term drought, suffered substantial flooding in 2023, particularly later in the year following heavy rains associated with El Niño and the positive Indian Ocean Dipole
- **Economic loss**- The largest reported economic loss from a single event in 2023 was from Hurricane Otis, which hit the Pacific coast of Mexico within 15 hours it had intensified to a category 5 system.
- **Marine heat waves (MHWs)-** It have become more frequent, intense, and longer lasting since the late 20th century, El Nino events tend to cause wide-spread MHWs in the eastern Tropical Pacific.
- **Vulnerable population**- Food security, population displacement and impacts on vulnerable populations continue to be of mounting concern in 2023, with weather and climate hazards exacerbating the situation in many parts of the world.
- **Climate finance**- The global adaptation financing gap is widening, falling well short of the estimated 212 billion dollars per year needed up to 2030 in developing countries alone.
- **Renewable energy growth**- There was a nearly 50% increase in renewable capacity additions in 2023, totaling 510 gigawatts – the highest in two decades

What lies ahead?

- Increasing support for *National Meteorological and Hydrological Services* (NMHS) is crucial for providing essential information services.
- Nationally Determined Contributions (NDCs) need to be based on science to effectively cut greenhouse gas emissions and transition to renewable energy sources.
- The need of the hour is to secure adequate financing at *COP-29* which is scheduled to be held in *Baku, Azerbaijan* to support the implementation of national climate plans, including funding for mitigation and adaptation measures, technology transfer, capacity-building initiatives, and resilience-building efforts, particularly in developing

countries.

References

1. The Hindu- WMO confirms 2023 as hottest year
2. WMO- State of Global Climate Report