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Greenhouse Gas Levels Reach Record Highs: UN Report

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Levels of heat-trapping greenhouse gases in the atmosphere have reached another new record high, according to **the United Nations weather agency, World Meteorological Organization (WMO)**.

Key Findings

- In its annual greenhouse gas bulletin, WMO reveals that there is **no sign of a reversal of the upward trend**, responsible for climate change, sea level rise, ocean acidification and extreme weather.
- It can be noted that report **talks about concentrations and not emissions**. The concentrations differ from emissions in that they represent what **remains in the atmosphere after some of the gases are absorbed by the seas, land and trees**. Since 1990 the warming impact of these long lived gases on the climate has increased by 41%.
- Atmospheric CO₂ reached 146% of the pre-industrial level in 2017, primarily because of emissions from combustion of fossil fuels and cement production, deforestation and other land-use change. Levels of other key greenhouse gases methane and nitrous oxide in the atmosphere also rose.
- The increase in **CO₂ concentration** from 2016 to 2017 was **smaller than the rise** from 2015 to 2016 **because of the impact of El Niño**, which peaked in 2015 and 2016. This triggered droughts in some parts of the world, which in turn **reduced the ability of forests and vegetation in these areas to soak up CO₂**, hence more of it stayed in the atmosphere.

El Nino

- El Niño means **The Little Boy, or Christ Child in Spanish**. It is a **periodic climate event** that causes waters to **warm up in east-central Pacific Ocean**, which in turn causes huge changes in wind directions bringing less rain to Southeast Asia and the Indian subcontinent, while increasing rain in other parts of the world.
- There is also an **opposite of an El Niño**, called **La Niña means The Little Girl in Spanish**. This refers to times when waters of the tropical eastern Pacific are **colder than normal** and trade winds blow more strongly than usual.
- Collectively, El Niño and La Niña are parts of an oscillation in the ocean-atmosphere system called **the El Niño-Southern Oscillation, or ENSO cycle**.

World Meteorological Organization (WMO)

- It is a **specialized agency of the United Nations**, which is dedicated to international cooperation and coordination on:
 - The state and behaviour of the **Earth's atmosphere**,
 - The atmosphere's **interaction with the land and oceans**,
 - The **weather and climate it produces**, and
 - The resulting **distribution of water resources**.
- The Secretariat, **headquartered in Geneva**, is headed by the **Secretary-General** (appointed by the **World Meteorological Congress for a four-year term**). Its supreme body is the World Meteorological Congress.
- WMO originated from the International Meteorological Organization (IMO), which was founded in 1873 to facilitate the exchange of weather information across national borders. **WMO became a specialized agency of the United Nations in 1951**.
- **Methane is the second most** important greenhouse gas, and about 60% of it in the atmosphere comes from human activities like cattle farming, rice cultivation and fossil fuel extraction. Levels in the atmosphere are now about 257% of what they were before the industrial revolution, and the rate of increase is very much constant over the last decade.
- **Nitrous oxide comes** from natural and human sources including fertiliser use and industry. It's now about 122% of pre-industrial levels. N_2O is emitted into the atmosphere from **both natural (about 60%) and anthropogenic sources (approximately 40%)**, including oceans, soils, biomass burning, fertilizer use and various industrial processes.

The likely causes of N_2O increase in the atmosphere are an **increased use of fertilizers in agriculture and increased release of N_2O from soils due to an excess of atmospheric nitrogen deposition related to air pollution**.
- **Sulphur hexafluoride (SF_6)** is a potent **long lived Green House Gas (GHG)**. It is produced by the **chemical industry**, mainly as an electrical insulator in power distribution equipment.

- While Chlorofluorocarbons (CFCs) and most halons are decreasing, some hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), which are also potent GHGs, are increasing at relatively rapid rates, although they are still low in abundance.
- The WMO also highlighted the **discovery of illicit production of CFC-11**, a banned chemical that both warms the planet and destroys ozone. Investigations indicate that at least some of the production is in China.
Under the **Montreal Protocol, CFC-11 was supposed to be phased out** of production.

Montreal Protocol

- Adopted on **16 September 1987**, the Montreal Protocol on **substances that deplete the ozone layer** regulates the production and consumption of nearly 100 man made chemicals referred to as Ozone Depleting Substances (ODS).
- The protocol provides for **phasing out halogenated hydrocarbons like tetrachloride, CFCs used in aerosols, halons** used in fire extinguishers, **HydroChloroFluoroCarbons (HCFCs)** used in refrigeration and foams, and **methyl** used in fumigation activity of agriculture.
- Since its adoption, it has undergone **eight revisions**, the latest and the **ninth being the Kigali agreement**.
- In **2016, Kigali amendment** was made to the protocol to **phase out HydroFluoroCarbon (HFC)**, a set of 19 gases in the hydrofluorocarbon family used extensively in the air-conditioning and refrigeration industry. Though **HFCs are not ozone-depleting** but are thousand times more dangerous than carbon dioxide in **causing global warming**.
- Under the amendment, developed nations will begin phasing down HFC gases by 2019, while developing countries will follow suit by 2024.

Conclusion

- This report by WMO needs to be seen alongside the recent IPCC 1.5C report which warned that the world needed to be essentially carbon neutral by 2050.
- The WMO bulletin comes out **before climate negotiators begin at the Conference of Parties (COP24) meeting in Katowice, Poland**, where countries will discuss putting the Paris climate agreement into practice and increasing their ambitions when it comes to cutting warming gases.