

### WORLD AIR QUALITY REPORT 2023

Delhi was identified as the capital city with the poorest air quality, according to a new report by World Air Quality Report 2023.



World Air Quality Report is published by the Swiss organisation IQAir.

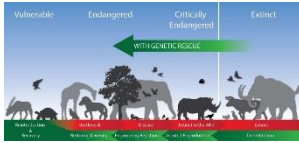
- **Highlights:**

- With an average air annual particulate matter 2.5 (PM2.5) concentration of 54.4 micrograms per cubic metre, **India had the third worst air quality.**
- India was better than only two of its neighbouring countries, **Bangladesh and Pakistan.**
- While **Bangladesh remained the most polluted country** in the world, with an average PM2.5 concentration of 79.9 micrograms per cubic metre, **Pakistan was second**, with a level of 73.7.
- It also **identified Delhi** as the **most polluted capital city in the world** for the fourth consecutive time. **Bihar's Begusarai** was termed the **world's most polluted metropolitan area.**
- **Ten out of the top 11 most polluted cities** in the world are from **India**, the other being Lahore in Pakistan.
- 96 percent of the Indian population experiences PM2.5 levels more than seven times the WHO annual PM2.5 guideline.

### What is Particulate Matter (PM)?

- It is made of **solid particles and liquid droplets in the air.** In general, any type of burning or any dust-generating activities are sources of PM.
- PM comes in **many different sizes.**
  - Larger particles come mostly from the soil. Smaller particles come from burning of fossil fuels, like gasoline in cars, diesel in trucks, and coal used by power plants.

## WHAT IS GENETIC RESCUE?



Genetic rescue is proposed as a method to conserve Ranthambore National Park's tiger population.

- Genetic rescue is the **process of increasing population growth with new genetic variation** by migrating individuals into another small population (i.e., gene flow).
- In practice, wildlife managers **take individuals from a larger, healthier population**, and bring them to a smaller population to introduce new variation. This conservation strategy aims to **alleviate genetic load, decrease extinction risk**, and enhance the viability of endangered species and populations.
- It is often employed in conservation biology to **mitigate the negative effects of inbreeding depression**, which can occur when individuals within a population mate with close relatives, leading to decreased reproductive success and viability of offspring.
- Genetic rescue can **have both beneficial and deleterious effects**, depending on factors such as the magnitude and duration of gene flow, as well as the genetic and non-genetic factors influencing population dynamics. There can be risks involved with moving animals around, so it's often **thought of as a last resort**.

## WHAT IS WEARABLE TECHNOLOGY?

Samsung officially announced the launch of a new smart ring-shaped wearable device, Galaxy Ring, as part of its Galaxy Unpacked event earlier this year.



- Wearable technology, also **known as "wearables,"** is a category of **electronic devices that can be worn as accessories**, embedded in clothing, implanted in the user's body, or even tattooed on the skin.
- These come in many shapes and sizes, including smart watches and sports watches, fitness trackers, head-mounted displays, smart jewellery, smart clothing and even

implantable devices. At a minimum, wearable devices are **equipped with sensors, software and connecting technology.**

- **Working:**
    - The sensors gather information from the person wearing the device and the software gathers the data and sends it to a device with processing capacity via a wireless connection.
    - The ecosystem on which wearable technology **works is known as the Internet of Things (IoT).**
  - **Benefits:**
    - Smart rings can provide **more accurate readings than smartwatches**, because they can use the capillaries (small blood vessels) in your finger to get their readings.
    - Another advantage of smart rings is that they have a longer battery life than smartwatches.
  - **Drawbacks:**
    - Smart rings won't be able to replicate the functionality offered by a smartwatch. Also, they are unlikely to come with GPS or a screen.
- 

## FOREST FIRES: NILGIRIS

For the past one week, forest fires have been raging in the Coonoor forest range in the Nilgiris in Tamil Nadu.

### What are Forest Fires/Wildfires?

- **Meaning:** It is an unplanned, uncontrolled and unpredictable fire in an area of combustible vegetation.
- **Causes:** Natural (lightning, high atmospheric temperatures and low humidity (dryness) and man-made (agricultural practices like Jhum, a source of fire (cigarette, bidi, etc)].

- **Types of forest fire:**



## How common are forest fires in India?

- **Period**

- November to June is considered to be forest fire season in India, with hundreds of thousands of small and large fires burning every year.

- April-May are usually the worst fire months across the country.

- **Affected areas**

- The biennial India State of Forest Report (ISFR) recorded in its 2019 report that more than 36% of India's forest cover was prone to frequent fires.
- About 4% of the forest cover was extremely prone to fire, and another 6% was very highly fire prone.

- **Most forest fires Regions**

- The forests of Northeast India, Odisha, Maharashtra, Jharkhand, Chhattisgarh, and Uttarakhand are the most vulnerable to fires.
  - In March 2023, large bushfires raged in Goa, triggering an investigation into whether they were man-made.
  - In 2021, a series of forest fires broke out in Uttarakhand, Himachal Pradesh, Nagaland-Manipur border, Odisha, Madhya Pradesh, and Gujarat, including in wildlife sanctuaries.

- **Forest fires in South India**

- Some forest areas in Andhra Pradesh and Telangana are fire-prone.
- However, according to the FSI, forests in southern India are comparatively less vulnerable to fires, as the vegetation type is mainly evergreen or semi-evergreen.
- That said, Tamil Nadu has been reporting wildfires in its forests in recent years.

**What is the reason for the fires this year?**

- **Climatic conditions**
  - This year, high aridity, above-normal day temperatures, clear sky conditions, and calm winds during the early phase of the summer season are some of the contributory factors for the spike in forest fire incidents in southern India.
- **Temperature in Southern India**
  - February 2024 was exceptionally hot over Southern India in particular.
  - It was South India's hottest since 1901, and January was the fifth warmest in more than a century.
- **High heat load**
  - Over the past two months, the recorded maximum, minimum, and mean temperatures have remained above-normal over the southern states.
  - This has helped build the heat load over the region well before the onset of the summer season.
- **Prevalence of Excess Heat Factor (EHF)**
  - The IMD has warned of the prevalence of EHF to be significantly higher than normal over western Andhra Pradesh and neighbouring Karnataka.
    - EHF is a value that predicts the chances of a heatwave over a region.
  - Maximum temperatures touched 40 degrees Celsius here last week, unusual for mid-March.
- **Mild aridity in southern India**
  - In the absence of rain and prevailing high temperatures, the IMD has classified almost all districts of southern India under mild aridity.

---

## OCEAN WARMING

### Why in news?

The average global sea surface temperature (SST) for February 2024 stood at 21.06 degree Celsius. This is the highest recorded temperature in a dataset that goes back to 1979. The previous record of 20.98 degree Celsius was set in August 2023.

## Why are the oceans getting warmer?

- **Greenhouse Gas (GHG) Emissions**
  - Since the Industrial Revolution, human activities such as burning fossil fuels have released high levels of GHGs in the atmosphere.
  - Carbon dioxide, methane, ozone, and nitrous oxide are some of the notable GHGs, which essentially trap heat in the atmosphere and contribute to global warming.
- **Heat Absorption**
  - Almost 90 per cent of the extra heat trapped by GHGs has been absorbed by the oceans, making them steadily warmer over the decades.
- **Deforestation**
  - Deforestation reduces the number of trees available to absorb CO<sub>2</sub> from the atmosphere. This leads to higher concentrations of GHGs, contributing to global warming and consequently, ocean warming.
- **Melting Ice**
  - As global temperatures rise, polar ice caps and glaciers melt, adding freshwater to the oceans.
  - This influx of freshwater can disrupt ocean currents and contribute to changes in temperature and salinity, further affecting ocean warming.
- **Impact of El Niño**
  - El Niño is a weather pattern that refers to an abnormal warming of surface waters in the equatorial Pacific Ocean.
  - It has contributed to both ocean warming and rising global surface temperatures.
- **Less dust blowing off the Sahara Desert** recently due to weaker-than-average winds.
  - Typically, the dust forms a giant umbrella that shades the Atlantic water and reduces ocean temperatures.
  - But now, the umbrella has partially folded and more of the Sun is beating down on the ocean.

## Why are rising sea surface temperatures a cause of worry?

- **Irreversible consequences for marine ecosystems**
  - Warmer oceans lead to increased ocean stratification, where water separates into layers based on density.
  - Warmer, lighter, less salty, and nutrient-poor water sits atop colder, saltier, and nutrient-rich water.
  - Normally, ocean processes like currents, wind, and tides mix these layers, but stratification disrupts this.
- **Threat to marine life**
  - Due to rise in temperatures, oxygen absorbed isn't able to mix properly with cooler ocean waters below, threatening the survival of marine life.
- **Impact on Phytoplankton**
  - Nutrients are also not able to travel up to the surface of the oceans from below. This could threaten the population of phytoplankton.
    - Phytoplanktons are single-celled plants that thrive on the ocean surface and are the base of several marine food webs.
- **Coral Bleaching**
  - Corals are highly sensitive to changes in SSTs. When waters become too warm, corals expel the algae living in their tissues, causing them to turn white or bleach.
  - Bleached corals are stressed and more susceptible to disease and death.
- **Extreme Weather Events**
  - Rising SSTs can lead to more intense storms, with higher wind speeds & heavier rainfall posing risks to coastal communities, infrastructure, and economies.
- **Sea Level Rise**
  - Warm water expands, contributing to thermal expansion of the oceans, which is a significant driver of global sea level rise.
  - Threatening coastal communities with more frequent and severe flooding, erosion, and saltwater intrusion into freshwater sources.

## WHAT IS DEVELOPING COUNTRIES TRADING SCHEME (DCTS)?

Exporters seeking to avail duty concessions on shipments to the UK will have to adhere to the new British rules under the Developing Countries Trading Scheme (DCTS).



Developing Countries Trading Scheme (DCTS) is a scheme introduced by the UK Government to facilitate developing countries to integrate into the global economy, create stronger trade and investment partnerships and strengthen supply chains.

- It is a simpler and more generous **preferential trading scheme** which has been designed to **boost trade with developing countries** in order to support their development.
- It **reduces or removes rates of duty**, or tariffs, on imports from eligible developing countries into the UK. It also enables UK businesses to access thousands of products from around the globe at lower prices, reducing costs for UK consumers.
- The DCTS **applies to 65 countries, that are:**
  - least developed countries (LDCs) as defined by the United Nations.
  - low-income countries (LIC) and lower middle-income countries (LMIC) as defined by the World Bank.
- It will **provide duty-free, quota-free trade to LDCs on everything but arms** and duty-free, quota-free trade on 85% of eligible goods to most low LIC and LMIC countries.
- It **does not extend to countries and territories deemed by the World Bank as ‘upper-middle income’** for three consecutive years, or to LICs and LMICs who have a free trade agreement (FTA) with the UK.

---

## WHAT ARE PEATLANDS?



- Peatlands are terrestrial **wetland ecosystems** in which **waterlogged conditions** prevent plant material from fully decomposing. Consequently, the **production of organic matter exceeds its decomposition**, which results in a net accumulation of peat.



- These occur in every climatic zone and continent and cover around 2.84% of the Earth's terrestrial surface.
  - The majority of the world's peatlands occur in boreal and temperate parts of the Northern Hemisphere, especially, Europe, North America, and Russia, where they have formed under high precipitation-low temperature climatic regimes.
  - About 84% of the world's peatlands are considered to be in natural, or near-natural state. Drained peatlands make up about 16% of the world's peatlands, or 0.5% of the Earth's terrestrial surface.
  - Due to the process of peat accumulation, peatlands are carbon rich ecosystems. Peatlands are the largest natural terrestrial carbon store. They store more carbon than all other vegetation types in the world combined.
  - Damaged peatlands are a major source of greenhouse gas emissions, responsible for almost 5% of global anthropogenic CO2 emissions.
- 

## EXERCISE TIGER TRIUMPH

Exercise Tiger Triumph is scheduled on the Eastern Seaboard from 18 to 31 March 2024.



Exercise Tiger Triumph is a bilateral tri-Service Humanitarian Assistance and Disaster Relief (HADR) Exercise between India and the US.

- It is aimed at developing interoperability for conducting HADR operations and refine Standard Operating Procedures (SOPs) to enable rapid and smooth coordination between forces of both countries.
  - On completion of the **Harbour Phase**, the ships, with the troops embarked, would sail for the **Sea Phase** and undertake Maritime, Amphibious and HADR operations in accordance with injected situations.
  - Indian Navy Ships with integral helicopters and landing crafts embarked, Indian Navy aircraft, Indian Army personnel and vehicles and Indian Air Force aircraft and helicopters along with the Rapid Action Medical Team (RAMT) would be participating in the exercise.
-