



## Drought in Europe

**For Prelims:** Drought, Heat waves, Land degradation, Climate Change

**For Mains:** Drought - Impacts, Causes and Ways to tackle it

### Why in News?

After the **record-breaking summer heat**, 2022 may be the **worst [drought](#) year in Europe in 500 years**. Large rivers have been reduced to shallow streams, hitting power generation.

- **China and the US too are facing drought situations.**

### What is a Drought?

- **About:**
  - Drought is generally considered as a **deficiency in rainfall /precipitation over an extended period**, usually a season or more, resulting in a **water shortage causing adverse impacts on vegetation, animals, and/or people**.
- **Causes:**
  - **Variability in rainfall**
  - **Deviation in the route of monsoon winds**
  - **Early withdrawal of the monsoon**
  - **[Forest fires](#)**
  - **[Land degradation](#)** in addition to **[Climate change](#)**
- **Types:**
  - **Meteorological Drought:** It is based on the degree of dryness or rainfall deficit and the length of the dry period.
  - **Hydrological Drought:** It is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
  - **Agricultural Drought:** It refers to the impact on agriculture by factors such as rainfall deficits, soil water deficits, reduced groundwater, or reservoir levels needed for irrigation.
  - **Socioeconomic Drought:** It considers the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods such as fruits, vegetables, grains and meat.

### How bad is the Drought Situation in Europe?

- **Present Scenario:**
  - The drought is considered the worst in 500 years. The European summer was this dry last in **1540**, when **a year-long drought killed tens of thousands of people**.
    - However, earlier European droughts such as those in **2003, 2010, and 2018** too

were compared to the 1540 event.

- Some of Europe's biggest rivers — [Rhine](#), [Po](#), [Loire](#), [Danube](#) — which are usually formidable waterways, are unable to support even mid-sized boats.
- As per an analytical report by the **Global Drought Observatory (GDO)**, an agency of the [European Commission](#), about **64% of the continent's landmass was experiencing drought** conditions.
  - Nearly **90% of the geographical area in Switzerland and France**, about **83% in Germany**, and close to **75% in Italy**, was facing **agricultural drought**.
  - The **situation is unlikely to improve** substantially in the coming months.
- **Causes:**
  - Droughts are part of the natural climate system and are not uncommon in Europe. The extraordinary dry spell has been the result of a **prolonged and significant deviation from normal weather patterns**.
    - It is the **record-breaking heat waves** that have resulted in temperatures in many countries rising to historic highs.
    - Unusually high temperatures have led to **increased evaporation of surface water and soil moisture**.
  - The severity of the current drought can also be attributed, to an extent, to the fact that it occurred **so soon after the 2018 drought**.
    - **Many areas in Europe were yet to recover from the last drought**, soil moisture had also not been restored to normal.

## What is Understood by Heat Waves?

- A heat wave is a **period of abnormally high temperatures** typically occurring between the months of March and June, and in some rare cases even extending till July.
- According to [India Meteorological Department \(IMD\)](#), a heat wave is declared when the **maximum temperature of a station reaches at least 40°C for Plains** and at least **30°C for Hilly regions**.
- **Impacts:**
  - **Transportation:** Europe depends heavily on its rivers to move cargo in an economical manner, including coal to power plants. With water levels down to less than a metre in some stretches, **most large ships have been rendered unusable**.
  - **Power:** Power production has been hit, leading to **electricity shortages** and a further **increase in energy prices** which were already high due to the [war between Russia and Ukraine](#).
    - Lack of adequate water has **affected the operation of nuclear power plants**, which use large amounts of water as coolant.
  - **Food Security:** **Food has become sharply more expensive** in many countries, and **drinking water is being rationed** in some regions. **Agriculture** has also been affected badly.

## What about the Drought Situations in the US and China?

- **Drought in China:**
  - Many parts of China too are headed towards a serious drought, **being described as the worst in 60 years**.
  - The country's **longest river, Yangtze**, which caters to about a third of the Chinese population, is seeing water levels drop to record lows.
  - Two of the country's biggest freshwater lakes, **Poyang and Dongting, have reached their lowest levels since 1951**.
  - The water scarcity is leading to problems similar to those in Europe.
    - The drought has posed a **"serious threat" to China's autumn grain production** which makes up about 75% of the country's annual grain output.
    - Power shortages in some areas have begun to **force factories to shut**, adding to the **strain on global supply chains**.
- **Drought in the US:**

- According to the US government, **over 40% of the area in the United States too is under drought conditions** currently, affecting about 130 million people.

## How Drought is Declared in India?

- In India, there is **no single, legally accepted definition** of drought. The **State Government is the final authority** when it comes to declaring a region as drought affected.
- The Government of India has published two important documents in respect of managing a drought.
  - The first step is to **look at two mandatory indicators - rainfall deviation and dry spell.**
    - Depending on the extent of the deviation, and whether or not there is a dry spell, the manual specifies various situations that may or may not be considered a drought trigger.
  - The second step is to **look at four impact indicators – agriculture, vegetation indices** based on remote sensing, **soil moisture, and hydrology.**
    - The **States may consider any three of the four types** of the Impact Indicators (one from each) for assessment of drought, the intensity of the calamity and make a judgement.
    - If all three chosen indicators are in the ‘severe’ category, it amounts to **severe drought**; and if two of the three chosen impact indicators are in the ‘moderate’ class, it amounts to **moderate drought.**
  - The third step comes in after both previous triggers have been set off. In that event, **“States will conduct sample surveys for ground** in order to make a final determination of drought.
    - The finding of field verification exercise will be the final basis for judging the intensity of drought as ‘severe’ or ‘moderate’.
- Once a drought is determined, the state government needs to **issue a notification specifying the geographical extent.** The **notification is valid for six months unless de-notified earlier.**

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### Prelims

**Q. Consider the following pairs: (2014)**

	<b>Programme/Project</b>	<b>Ministry</b>
1.	Drought-Prone Area	Ministry of Agriculture & Farmers Welfare
2.	Desert Development Programme	Ministry of Environment, Forests & Climate Change
3.	National Watershed Project Development for Rainfed Areas	Ministry of Rural Development

**Which of the above pairs is/are correctly matched?**

- (a) 1 and 2 only
- (b) 3 only
- (c) 1, 2 and 3
- (d) None

**Ans: (d)**

### Mains

**Q.** The process of desertification does not have climate boundaries. Justify with examples. **(2020)**

**Q.** In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India? **(2016)**

**Source: IE**

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