



## Growing Water Stress in India

This editorial is based on [“India’s growing water crisis, the seen and the unseen”](#) which was published in The Hindu on 15/09/2022. It talks about the growing water stress in India and related issues.

**For Prelims:** United Nations World Water Development Report of 2022, Falkenmark Indicator, Composite Water Management Index, Cauvery River Water Dispute, Teesta River-Water Dispute, Eutrophication, Blue-Green Infrastructure.

**For Mains:** Water Stress and Water Risk, Challenges Regarding Water Management in India, Sustainable Groundwater Management.

According to the [United Nations World Water Development Report of 2022](#), global concern is growing over the **rapid withdrawal of fresh water** from streams, lakes, aquifers, and human-made reservoirs, as well as the impending [water stress](#) and **scarcity** experienced around the world. Moreover, this situation has also been **aggravated by changing climatic trends**, frequent natural disasters and sudden quakes of **pandemics**.

Promoting sustainable economic growth is paramount in India’s transition towards a [5 trillion dollar economy](#). Water is one such vital resource in this endeavour. India, accounting for around **17% of the world population**, has been endowed with just **4% of the world’s fresh water resources**, which clearly highlights the need for its judicious use and efficient water risk management.

### What is Water Stress and Water Risk?

- **Water stress** occurs when the **demand for water exceeds the available amount during a certain period** or when **poor quality restricts its use**.
  - **Components of Water Stress:**
    - Availability
    - Quality
    - Accessibility
- **Water risk** refers to the possibility of an entity experiencing a **water-related challenge** (e.g., [water scarcity](#), **water stress**, **flooding**, **infrastructure decay**, **drought**) due to deteriorating **water health** and inefficient [water governance](#).

### What is Falkenmark Indicator or Water Stress Index?

- It relates the **total freshwater resources with the total population** in a country and indicates the pressure that population puts on water resources, including the needs for natural ecosystems.
- In a country, if the amount of **renewable water** per person is:
  - below **1,700 m<sup>3</sup>**, the country is said to be experiencing **water stress**.

- below **1,000 m<sup>3</sup>**, it is said to be experiencing **water scarcity**.
- below **500 m<sup>3</sup>**, it is experiencing **absolute water scarcity**.

## What is the Status of Water Management in India?

- **Current Status:** India extracts most **groundwater** in the world, more than the 2<sup>nd</sup> and 3<sup>rd</sup> largest extractors (**China and the United States**) together. However,
  - **Only 8% of the extracted groundwater in India is used for drinking.**
  - **80% goes to irrigation**
  - Remaining **12% goes to industrial uses.**
  - The **Composite Water Management Index** by **NITI Aayog** has sounded a note of caution about the **water crisis in India**, with more than 600 million people facing acute water shortages.
    - It is also projected the country's water demand to be twice the available supply by 2030.
- **Constitutional Provision:**
  - **Fundamental Right:** Water is the basic need for the survival of human beings and is part of the **right to life** as enshrined in **Article 21** of the Constitution of India.
  - **Entry 56 of Union List:** The central government can regulate and develop **inter-state rivers and river valleys** to the extent determined by Parliament as expedient in the public interest.
  - **Entry 17 of State List:** It deals with water supply, irrigation, canals, drainage, embankments, water storage, and water power.
  - **Article 262:** It states that in case of disputes relating to waters:
    - By law, Parliament can resolve disputes or complaints related to the use, distribution, or control of interstate rivers or river valleys.
    - Parliament may, by law, **provide that no court, including the Supreme Court, shall have jurisdiction** over any such dispute or complaint.
- **Legal Provisions:**
  - **Inter-State Water Dispute Act, 1956:** The **Inter-State Water Dispute Act** enables the states to enrol the central government in setting up an Advisory River Board to resolve issues in inter-state cooperation.
  - **Water (Prevention and Control of Pollution) Act, 1974:** It establishes an institutional structure for preventing and abating water pollution while maintaining standards for water quality.
    - **Central Pollution Control Board (CPCB)** is a statutory organisation which was constituted in September, 1974 under the **Water (Prevention and Control of Pollution) Act, 1974.**

## What are the Challenges Regarding Water Management in India?

- **Potential Rural-Urban Conflict:** Cities are rapidly expanding as a result of rapid **urbanisation**, and a large **influx of migrants** from rural areas has increased the per capita use of water in cities, which is causing water to be **transferred from rural reservoirs to urban areas** to meet the deficit.
  - Considering the **downward trend of water level** in urban areas, it is likely that cities will rely heavily on rural areas for raw water supply in the future, which may **spark the rural-urban conflict**.
- **River-Water Dispute:** Majority of rivers flowing in two or more states in India have been a subject to **water sharing disputes** between their states regarding their **use, distribution, and control**.
  - Some major **inter-state river water disputes** are:
    - **Krishna River** - Maharashtra, Andhra Pradesh, Karnataka, Telangana
    - **Cauvery River** - Kerala, Karnataka, Tamil Nadu and Puducherry
    - **Periyar River** - Tamil Nadu, Kerala
    - **Narmada River** - Madhya Pradesh, Gujarat, Maharashtra, Rajasthan

- India faces river water disputes not only among its states but **also with its neighbouring countries. For example:**
  - **Brahmaputra River- India, China**
  - **Teesta River- India, Bangladesh**
- **Ineffective Waste Water Management:** In a highly **water-stressed environment**, the inefficient use of wastewater is leaving India unable to make the most economical use of its resources. In cities, most of this water is in the form of **greywater**.
  - According to a recent report published by the **Central Pollution Control Board** (March 2021), **India's current water treatment capacity is 27.3%** and the sewage treatment capacity is 18.6% (with another 5.2% capacity being added).
    - Still, **most sewage treatment plants do not function at maximum capacity** and do not conform to the standards prescribed.
- **Food Security Risk: Crops and livestock** need water to grow. Water is used extensively for **irrigation in agriculture** and serves as a **major source of domestic consumption**. Given the combination of rapidly declining groundwater levels and inefficient river water management, **food insecurity is likely to follow**.
  - The impacts of water and food scarcity can undermine basic livelihoods and exacerbate **social tensions**.
- **Rising Water Pollution:** There is a large amount of **domestic, industrial, and mining** waste that is discharged into water bodies, which can lead to **waterborne illnesses**. Moreover, water pollution can lead to **eutrophication**, which can significantly **impact aquatic ecosystems**.
- **Overexploitation of Groundwater: 256 of 700** districts in India have reported **critical or overexploited groundwater levels** according to the most recent study of the **Central Ground Water Board**.
  - **Wells, ponds and tanks** are drying up as groundwater resources come under increasing pressure due to **over-reliance and unsustainable consumption**. This has escalated the water crisis.

## What are the Current Government Initiatives Related to Water Management?

- [National Water Policy, 2012](#)
- [Pradhan Mantri Krishi Sinchayee Yojana](#)
- [Jal Shakti Abhiyan- Catch the Rain Campaign](#)
- [Atal Bhujal Yojana](#)

## What Should be the Way Forward?

- **Sustainable Groundwater Management:** There is a need to devise a proper mechanism and rural-urban integrated projects for **artificial recharge to groundwater** and **rainwater harvesting at household level, conjunctive use of surface water and groundwater, and regulation of water reservoirs**.
  - In addition, there is also a need to improve water infrastructure (**groundwater wells, dams, storage tanks, pipelines, etc**) which will not only reduce the amount of clean water being wasted but will also **help reduce the number of persons constantly searching for clean water on a daily basis**.
- **Smart Agriculture: Drip irrigation** is a powerful technology that can reduce water consumption by 20-40% while increasing crop yield by 20-50% compared to furrow (flood) irrigation.
  - Also, **cultivation of less water-intensive crops** like pulses, millets and oilseeds should be encouraged **in water-stressed regions**.
- **Blue-Green Infrastructure:** Combining **green and blue** elements together in modern infrastructure planning can be an effective way of providing a sustainable **natural solution** for **watershed management** and eco friendly infrastructure.
  - **Green indicates:** gardens, permeable pavements, green roofs.
  - **Blue indicates:** water bodies like rivers, canals, ponds and **wetlands**.
- **Water Conservation Zone:** There is a need to shift focus towards efficient water governance and increased data discipline regarding the status of water bodies at regional, state and national level,

and setting up **water conservation zones**.

- **Leveraging Modern Water Management Techniques:** [Information Technology](#) can be linked with water-related data systems. Also, in recent years, breakthroughs in research and technology have made it possible to make **water that was considered unfit for consumption**, clean and safe for consumption.
  - Some of the most frequently used techniques include [Electrodialysis Reversal \(EDR\)](#), [Desalinization](#), **Nanofiltration**, and **Solar and UV Filtration**.

### ***Drishti Mains Question***

What is Water Stress? Discuss the current challenges related to water management in India?

## **UPSC Civil Services Examination, Previous Year Question (PYQ)**

### **Prelims**

**Q.1 Which one of the following ancient towns is well known for its elaborate system of water harvesting and management by building a series of dams and channelizing water into connected reservoirs? (2021)**

- (a) Dholavira
- (b) Kalibangan
- (c) Rakhigarhi
- (d) Ropar

**Ans: (a)**

**Q.2 With reference to 'Water Credit', consider the following statements: (2021)**

1. It puts microfinance tools to work in the water and sanitation sector.
2. It is a global initiative launched under the aegis of the World Health Organization and the World Bank.
3. It aims to enable the poor people to meet their water needs without depending on subsidies.

**Which of the statements given above are correct?**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (c)**

### **Mains**

**Q.1 What are the salient features of the Jal Shakti Abhiyan launched by the Government of India for water conservation and water security? (2020)**

**Q.2 Suggest measures to improve water storage and irrigation system to make its judicious use under the depleting scenario. (2020)**

