



Holistic Water Management System

For Prelims: Sustainable Groundwater Management, Eutrophication, Swachh Bharat Mission, Jal Jeevan Mission, Food Insecurity.

For Mains: Integrated Urban Water Management System, Challenges Regarding Water Management in India.

Why in News?

With the rapid growth of cities, water **demand has exponentially increased**. Even as aspirations cause people to migrate to urban areas, **water depletion and scarcity remains a huge challenge** staring at people's faces in the near future.

What is the Need for a Holistic Water Management System?

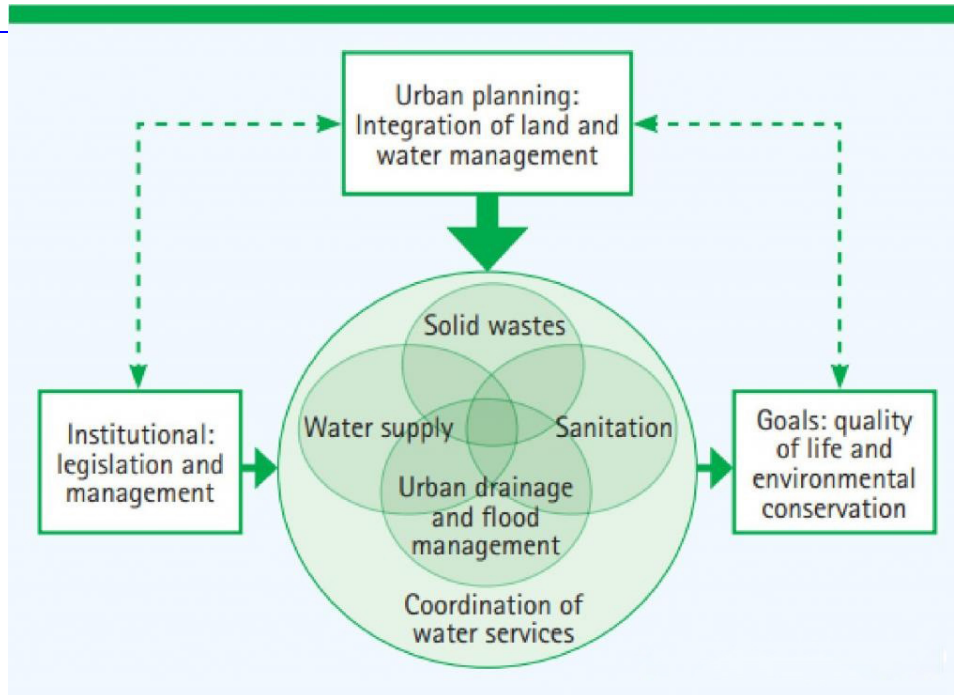
- Around 35 % of India's population lived in urban areas as of 2020, it is expected to double by 2050.
- In urban areas, only 45 % of the demand is met **using groundwater resources**. Apart from this, **climate change, pollution and contamination have also added to the burden** on water resources.
- As water demand exceeds supply in most cities, **water management needs to undergo a revolution** to ensure most urban areas can be self-sufficient in the future.
- In India, there are different water management systems based on **utilities like sanitation, urban water, stormwater and wastewater** that deal with water-related issues in different localities. Since areas and localities define distribution and water allocation, it is **often a challenge to find a unified solution**.
- Thus, water management needs to undergo a revolution and **Integrated Urban Water Management (IUWM) system for reliable supply** is ensured in most urban areas for self-sufficiency in the future.

What is an Integrated Urban Water Management System?

- **About:**
 - IUWM is a process, which ensures water supply, used water management, sanitation and stormwater management **can be planned in line with economic development and land use**.
 - This holistic process **makes coordination among water departments easier** at the local level.
 - It also helps **cities adapt to climate changes and manage water supply** more efficiently.
- **Approaches:**
 - Collaborative Action:
 - Clear coordination amongst all the stakeholders, it is easily defined and prioritizes

accountability.

- While effective legislation will help guide local authorities, **engaging local communities will lead to faster solutions** in water management.
- **Shift in Perception of Water:**
 - It is essential to understand **how water is inseparable in its connection** to economic development, city infrastructure and land use.
- **Understanding Water as a Resource:**
 - Water is a resource for various end goals thus it will **be easier to treat different kinds of water based on agricultural**, industrial and environmental purposes.
- **Customized Solutions for Different Cities:**
 - IUWM focuses on **specific contexts and local requirements and** prioritizes a **rights-based solution approach** over a one-size-fits-all approach.



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.
- **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).
- **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](#).
- A NITI Aayog report says that India is suffering from the worst water crisis in its history, citing that, 21 cities- including Bangalore, Delhi, Hyderabad and Chennai- **probably exhausted their groundwater resources in 2021**
- 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 Related Initiatives?

- [Swachh Bharat Mission](#).
- [Jal Jeevan Mission](#)
- [National Water Policy, 2012](#)
- [Pradhan Mantri Krishi Sinchayee Yojana](#)
- [Jal Shakti Abhiyan- Catch the Rain Campaign](#)
- [Atal Bhujal Yojana](#)
- [Sujalam 2.0](#)
- [Amrit Sarovar Mission](#)

Way Forward

- With climate change and population growth leading to increased water use, **new solutions have to be conceived for better urban water management**. More people in different local contexts **need to be made aware of the challenges**.
- Similarly, there are changes required in institutions like local departments that play a crucial role. It is essential that **holistic and systemic solutions are implemented to solve water issues**.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. What are the benefits of implementing the 'Integrated Watershed Development Programme'? (2014)

1. Prevention of soil runoff
2. Linking the country's perennial rivers with seasonal rivers
3. Rainwater harvesting and recharge of groundwater table
4. Regeneration of natural vegetation

Select the correct answer using the code given below:

- (a)** 1 and 2 only
- (b)** 2, 3 and 4 only
- (c)** 1, 3 and 4 only
- (d)** 1, 2, 3 and 4

Ans: (c)

- The Integrated Watershed Development Programme (IWDP) is implemented by the Department of Land Resources of Ministry of Rural Development.
- The main objective of IWDP is to restore ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. **Statements 1, 3 and 4 are describing ways to conserve and develop soil, water and vegetative crop and**

are included in IWDP.

- Watershed development refers to the conservation, regeneration and the judicious use of all the resources – natural (like land, water, plants, animals) and human – within the watershed area. **Hence, 1, 3 and 4 are correct.**
- However, the linking of the country's perennial with seasonal rivers is not done under the watershed development programme. **Hence, 2 is not correct.**
- **Therefore, option (c) is the correct answer.**

Q. On the planet earth, most of the freshwater exists as ice caps and glaciers. Out of the remaining freshwater, the largest proportion (2013)

- (a)** is found in atmosphere as moisture and clouds
- (b)** is found in freshwater lakes and rivers
- (c)** exists as groundwater
- (d)** exists as soil moisture

Ans: (c)

Mains

Q. Enumerate the National Water Policy of India. Taking river Ganges as an example, discuss the strategies which may be adopted for river water pollution control and management. What are the legal provisions of management and handling of hazardous wastes in India? **(2013)**

Q. "The ideal solution of depleting ground water resources in India is water harvesting system". How can it be made effective in urban areas? **(2018)**

Q. What is water stress? How and why does it differ regionally in India? **(2019)**

Source: DTE

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