



## Chapter - 23 Water Resources

The government launched the unified **Ministry of Jal Shakti in 2019** to address India's water challenges and provide clean drinking water. This new ministry is formed by merging the **Ministry of Water Resources, River Development, Ganga Rejuvenation, and Ministry of Drinking Water and Sanitation**. The ministry's responsibilities include policy formulation, technical assessments of projects, resolving water disputes, managing groundwater, coordinating irrigation and flood control, ensuring dam safety, and rejuvenating rivers like the Ganga, among other crucial tasks related to water resources across the country and with neighbouring nations.

### Water Availability

- The annual water availability in a region depends on **hydro-meteorological and geological factors** and remains relatively constant.
  - India receives about 3,880 BCM of mean annual precipitation, out of which the utilisable water available is limited to 1,122 BCM per annum.
  - The average annual per capita water availability was 1820 cubic metres in 2001 and reduced to 1545 cubic metres in 2011.
  - It is projected to further decrease to **1340 cubic metres in 2025** and 1140 cubic metres in 2050.
- The total water requirement for the country is estimated to be 843 BCM and 1180 BCM for the years 2025 and 2050, respectively.
- **Water stressed conditions** are indicated by an annual per capita water availability of **less than 1700 cubic metres**, while water scarcity conditions are indicated by availability below 1000 cubic metres.

### National Water Policy

- The **National Water Policy, 2012** was adopted to improve the conservation, development, and management of water resources.
- It emphasises community participation, incentivizing water saving in irrigation, conservation of rivers and water bodies, and addressing declining groundwater levels.

### National Water Mission (NWM)

- The NWM, under the **National Action Plan on Climate Change (NAPCC)**, aims to conserve water, minimise wastage, and ensure equitable distribution through integrated water resources management.
- Its goals include creating a comprehensive water database, promoting water conservation, focusing on vulnerable areas, improving water use efficiency, and integrating basin-level water resources management.

### National Water Awards

National Water Awards recognize excellence in water conservation across various categories such as states, districts, village panchayats, municipal bodies, schools, media, etc.

## Jal Shakti Abhiyan

- The Ministry of Jal Shakti initiated the "**Jal Shakti Abhiyan: Catch the Rain**" campaign to promote **water conservation, rainwater harvesting, renovation of water bodies, recharge of bore wells**, watershed development, and afforestation.
- The campaign aims to cover all districts, rural and urban areas, and is monitored through an MIS portal developed by the National Water Mission.

## Sahi Fasal Campaign

- The **Sahi Fasal campaign** encourages farmers in water-stressed areas to cultivate crops that are water-efficient, economically viable, healthy, and suitable for the local agro-climatic conditions.
- Creating awareness among farmers about suitable crops, micro-irrigation techniques, and soil moisture conservation, while promoting crops with low water requirements, is a significant intervention.
- This effort aims to support policymakers in **devising effective pricing strategies for inputs like water and electricity**, improving procurement and marketing channels for alternative crops, and establishing adequate storage facilities.

## National Mission for Clean Ganga

- Previous efforts to clean the Ganga river included the **Ganga Action Plan (GAP)** launched in 1985, which extended over two phases (GAP I & GAP II) and primarily addressed urban wastewater.
- In 2015, the "**Namami Gange**" - Integrated Ganga Conservation Mission program aimed to integrate past and ongoing initiatives along with new projects.
- The establishment of the National Ganga Council and the conversion of the National Mission for Clean Ganga (NMCG) into an authority in 2016 marked a significant shift in the management and rejuvenation efforts for the River Ganga.

## Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

### Objective of PMKSY:

- Achieve convergence of investments in irrigation at the field level.
- Enhance physical access to water on farms, expanding cultivable area under assured irrigation ("**har khet ko pani**").
- Improve on-farm water use efficiency to reduce wastage and increase availability.
- Enhance recharge of aquifers and introduce sustainable water conservation practices.
- Promote extension activities on water harvesting, management, and crop alignment for farmers and field functionaries.
- Attract greater private investments in precision irrigation.

### Projects under PMKSY:

- **PMKSY-AIBP:** Funds major and medium irrigation/multipurpose irrigation projects.
- **PMKSY-Har Khet Ko Pani (HKKP):** Funds Repair, Renovation, and Restoration (RRR) of Water Bodies, Surface Minor Irrigation (SMI) projects and Command Area Development & Water Management (CAD&WM) projects.

## Flood Management

- **Flood Management Programme (FMP):**
  - **Launched during XIth FYP** to provide central assistance to states for river management, flood control, anti-erosion, drainage development, flood proofing, and restoration of damaged flood management works.
  - **Merged with Flood Management and Border Areas Programme (FMBAP) and River Management Activities and Works related to Border Areas (RMBA)** schemes.

- **River Management Activities related to Border Areas:**
  - **Central sector scheme since 2014** covering major works/schemes during the XIIth FYP.
  - Involves hydrological observations and flood forecasting on common border rivers with Nepal, Bhutan, Bangladesh, and China.
- **Ganga Flood Control Commission (GFCC):**
  - **Estd. - 1972** to address critical and chronic flood issues in the Ganga Basin.
  - Functions include laying down policies, deciding priorities, formulating comprehensive flood control plans, and approving schemes.
  - Acts as the secretariat and executive limb of Ganga Flood Control Board (GFCB), headquartered in Patna, dealing with floods and their management in Ganga Basin states.

## Ground Water

### Ground Water Development Scenario:

- Variations exist in groundwater potential across the country, with areas like Indo-Gangetic Alluvium having high potential and hard rock areas having limited resources.
- **Central Ground Water Board (CGWB)** conducts periodic assessments of ground water resources in collaboration with state ground water departments.

### Aquifer Mapping and Aquifer Management Plan:

- National Project on Aquifer Management (NAQUIM) initiated during XIIth FYP by CGWB to identify, delineate, characterise, and manage aquifers effectively to ensure sustainability of groundwater resources.

### Central Ground Water Authority (CGWA):

- Responsible for regulating and controlling ground water development and management in India.
- Functions include exercising powers under the **Environment (Protection) Act, 1986** (estd. under the same act), issuing directives, and resorting to penal provisions.
- Regulates and controls the management and development of ground water, issuing necessary regulatory directions.

## Central Water Commission

- Headed by a Chairman, holding the status of an ex-officio Secretary to the Government of India.
- Divided into three wings: Designs and Research Wing (D&R), Water Planning and Projects Wing (WP&P), and River Management Wing (RM).

### Functions of CWC:

- Appraisal of irrigation, flood control, and multipurpose projects.
- Collection and analysis of hydrological data.
- Publication of statistical data on water resources.
- Providing flood forecasting services.
- Construction of river valley development schemes.
- Training engineers on water resource development.
- Promoting modern data collection techniques.
- Conducting morphological studies and advising governments.

## Dam Safety

- The Dam Safety Act 2021 Provides for surveillance, inspection, operation, and maintenance of specified dams to prevent dam failure disasters.
  - Establishes institutional mechanisms for ensuring safe functioning.
- **National Committee of Dam Safety (NCDS) and National Dam Safety Authority (NDSA):** - Constituted in 2022 to oversee dam safety.

- **National Register of Large Dams (NRLD)** - compiled by CWC.
- **Dam Rehabilitation and Improvement Project (DRIP):**
  - Rehabilitated 221 dams.
  - Prepared Emergency Action Plans (EAP) and Operation and Maintenance (O&M) manuals for all DRIP dams.
  - Published 13 guidelines/manuals.
  - Reviewed design floods of 250 dams and inspected 260 dams through dam safety review panels.
  - Developed a web-based management tool called Dam Health and Rehabilitation Monitoring Application (DHARMA).
- **Farakka Barrage Project:**
  - Located in Murshidabad district, West Bengal, under the Ministry of Water Resources, River Development, and Ganga Rejuvenation.
  - Established in **1961** to execute, operate, and maintain the Farakka Barrage Project Complex.
  - **Main objective:** Divert Ganga waters to Bhagirathi-Hoogly river system through a feeder canal to preserve and maintain Kolkata Port, improving the regime and navigability of Bhagirathi-Hoogly river system.
  - **Facilitates implementation of India-Bangladesh Ganga Water Treaty-1996** for sharing Ganga water between India and Bangladesh.

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