National Project on Aquifer Management (NAQUIM)

The National Project on Aquifer Management (NAQUIM) is an initiative of the Ministry of Jal Shakti, GOI for the mapping and management of all the aquifer systems of the country. In this article, you can read all about NAQUIM for the UPSC Exam.

National Project on Aquifer Management

The National Project on Aquifer Management (NAQUIM) is implemented by the Central Ground Water Board (CGWB) for the mapping of aquifers in India.

- NAQUIM was launched in 2012 on the basis of the recommendations of the 12th Plan Working Group on Sustainable Groundwater Management of the erstwhile Planning Commission (at present NITI Aayog).
- The primary objective of the project as stated by the authorities is **'Know your Aquifer, Manage your Aquifer'**.
- A key goal of the project is to promote participatory groundwater management.

- **NAQUIM Stated Objectives:**
  - Delineation and characterisation of aquifers in three dimensions.
  - Identification and quantification of issues.
  - Development of management plans to ensure the sustainability of groundwater resources.
- Four **stages of activities in NAQUIM** are as follows:
  - Stage 1: Collecting, compiling and analysing existing data; data gaps are identified based on the data requirement protocol.
  - Stage 2: Through scientific investigations, the required data is generated in data gaps.
  - Stage 3: Data integration, development of lithologic models, and configuration of aquifers; resource behaviour, hydraulic properties, water level regime and chemical quality is verified in space-time domain.
  - Stage 4: Multiple supply and demand-side interventions are formulated and prescribed to sustainably utilise groundwater, taking into account local issues.
- For these functions, many research institutions like IIT Kanpur, IISC Bengaluru, the National Remote Sensing Agency, Hyderabad, the Geological Survey of India, and the National Geophysical Research Institute, Hyderabad are roped in at different stages.
- The output of the investigations are deliberated upon and checked at various stages. After that, they are cleared by a committee of independent interdisciplinary experts.
- The reports are then submitted to the State Level Coordination Committees, which are formed in each state and UT.

What are Aquifers?

Aquifers are underground water-bearing permeable rocks or rock formations. The study of water flow in aquifers and the characterization of aquifers is called hydrogeology. Groundwater can be extracted from aquifers.

What is Aquifer Mapping?

According to the Aquifer Information and Management System of the Central Ground Water Board, "aquifer mapping can be defined as a scientific process, wherein a combination of geologic, geophysical, hydrologic and chemical field and laboratory analyses are applied to characterize the quantity, quality and sustainability of ground water in aquifers."

- Aquifer mapping is important for our understanding of the geologic framework of aquifers, water levels in the aquifers, aquifers' hydrological characteristics, and how the water levels change over time.
- Aquifer mapping also helps us study the occurrence of anthropogenic and natural contaminants that can affect the potability of groundwater.
- This will also aid policymaking in devising and monitoring various groundwater management plans and programs which will help achieve drinking water security, improved irrigation facilities and sustainability in water resources development in the country.

Why is aquifer mapping important?

Aquifer mapping is important because many developmental activities have adversely affected the level and quality of groundwater in various regions of the country.

- India's agricultural production is intricately linked to groundwater resources.
- Unscientific use of groundwater has led to the country facing the risk of a water crisis.
- CGWB's own assessment based on GRACE satellite data demonstrates how there has been rapid aquifer desaturation in many places.
- Groundwater overexploitation often leads to an increased economic burden on farmers because of the need to dig deeper wells, rising energy costs to lift water, increased salinity of water, the spread of geogenic contaminants (arsenic, fluoride), and ingress of seawater in freshwater aquifers in coastal areas.
- The larger effects of aquifer depletion are yet to be fully understood but the probable effects are wetlands drying up, declining flow of non-glacier fed rivers, changes in hydraulic behaviour of aquifers, etc.