UN Report on Groundwater Depletion

Why in news?

Interconnected Disaster Risk Report 2023, released by the academic arm of United Nations, reveals that 21 of the 37 world's aquifers are depleting faster than they can be replenished.

Interconnected Disaster Risk Report
• **Launch year**- 2021 • **Launched by-** Institute for Environment and Human Security (UNU-EHS), the academic arm of UN • **Headquarters -** Bonn, Germany • **Objective-** To analyse and shed light on the interconnections of disasters with each other and with human actions. • **2023 report-** The world is inching closer to ***6 interconnected risk tipping points.*** • A risk tipping point is defined as the moment at which a given socio-ecological system is no longer able to buffer risks and provide its expected functions, after which the risk of catastrophic impacts to these systems increases substantially.

What does the report reveal about the groundwater crisis?

Around ***30%*** *of the world's fresh water* is stored as groundwater

- **Groundwater** – It is an essential freshwater resource stored in underground reservoirs called *"aquifers".*
- Groundwater depletion can be defined as the *prolonged withdrawal of groundwater from an aquifer* in quantities exceeding average annual replenishment, leading to a persistent decline in groundwater levels and volumes.
- **Findings -** Over 2 billion people rely on groundwater as an essential supply of drinking water.
- The regions where groundwater depletion is most severe include parts of India, north-eastern China, western US, Mexico, Iran, Saudi Arabia and parts of Northern Africa.
- ***India pumps up the most groundwater globally***, mainly for irrigation, domestic and industrial uses.
- Some areas in the *Indo-Gangetic basin region* have already passed the groundwater depletion tipping point.
- In *Punjab and Haryana*, groundwater exploitation is reported with 78% of wells in Punjab are overexploited and the region will face critically low groundwater availability in 2025.
- 70% of groundwater withdrawals are used for agricultural purpose.
- As per the report, *agricultural intensification* is a major factor pushing us towards

groundwater depletion risk.

To know about India's groundwater governance click here

What are the causes of groundwater depletion?

- **Agricultural intensification**- Groundwater has been used extensively in *arid regions* like Saudi Arabia, India (Punjab) to grow crops such as wheat and rice, leading to depletion of aquifers.
- **Lack of planning**- Groundwater is a limited and essential resource, but poor management of river systems and groundwater resources leads to overreliance, depletion and exploitation.
- **Lack of data**- Absence of data favours the practice of over extraction since it makes sustainable water management efforts more difficult to develop and monitor.
- **Policy paralysis** - There is a link between power subsidies and excessive groundwater extraction in some States.
- **High Temperature**- Hot temperatures will reduce the moisture available for recharging aquifers, especially in hard rock regions, further aggravating the depletion.

What are the impacts of groundwater depletion?

- **Livelihood loss-** It reduces crop yields and affects farming livelihoods who depend on groundwater for irrigation.
- **Migration**- Groundwater depletion exacerbates water conflicts in arid regions, such as the *Sahel and Sahara*, thereby causing migration or displacement.
- **Health issues-** Reduction in cooling effect of groundwater on land and atmosphere, and increase in humidity and wet-bulb temperatures in the air can increase the risk of unbearable heat-related illnesses.
- **Food and water insecurity**- It threatens food and water security for both exporting and importing countries that rely on groundwater for crop production.
- **Biodiversity loss**- It affects the survival of *endemic species* in aquifers and increase the likelihood of *extinctions*.
- **Effect on environment** - It also reduces river base flow and wetland health.

Steps taken to promote Groundwater Conservation

• **National Aquifer Mapping and Management Program**- Undertaken by Central Ground Water Board (CGWB) under Ground Water Management and Regulation scheme in order to delineate and characterize the aquifers and to prepare management plans.
• **National Water Policy** - It was implemented to govern the planning and development of water resources and their optimum utilization.
• **Master Plan for Artificial Recharge to Groundwater** - It has been prepared in 2020 with respective State counterparts which includes artificial recharge in both rural and urban areas.
• **Jal Shakti Ministry** - In 2019, Jal Shakti Ministry was created (a merger of Ministries of Water Resources, River Development and Ganga Rejuvenation with Drinking Water and Sanitation).
• **Jal Shakti Abhiyan** - It was launched in 2019 in *water stressed blocks* of 256 districts to harvest the monsoon rainfall through artificial recharge structures, watershed management, etc.,
• **Jal Shakti Abhiyan: Catch the Rain 2023**- It is targeting *"Source sustainability for drinking water*" for source strengthening/ source stabilization of rural drinking water supply schemes.
• **Atal Bhujal Yojana**- It was piloted in 2018 to *recharge ground water* and create sufficient water storage for agricultural purposes.
• **N-GRES** - A software, 'India-Groundwater Resource Estimation System (IN-GRES)', has o been developed for ground water resources assessment.
• **Groundwater guidelines** - The comprehensive groundwater guidelines 2020 provided for regulation in various sectors making the processes of issuing a no-objection certificate transparent and time-bound.

What lies ahead?

- The need of the hour is to ensure transparency, foster public awareness and education, promoting less thirsty crops and efficient watering techniques.
- The report advocates for using technologies that can monitor the water level in borewells and tubewells.

References

1. Indian Express- UN report on groundwater depletion
2. UNU-EHS Interconnected Disaster Risk Report 2023

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