Ageing Dams of India: UN Report

Why in News

According to a **United Nations** (UN) report "**Ageing water infrastructure: An emerging global risk**", over 1,000 large **dams in India** will be roughly 50 years old in 2025 and such ageing embankments across the world pose a growing threat.

- The report, compiled by **Canada-based Institute for Water, Environment and Health,** says the world is unlikely to witness another large dam-building revolution as in the mid-20th century, but dams constructed then will inevitably be showing their age.
- The analysis includes dam decommissioning or ageing case studies from the **USA, France, Canada, India, Japan, and Zambia and Zimbabwe**.

Key Points

- **Global Scenario:**
    - Most of the **58,700 large dams** worldwide were **constructed between 1930 and 1970** with a design life of 50 to 100 years.
    - **By 2050,** most people on Earth will **live downstream of tens of thousands of large dams built in the 20th century,** many of them already operating at or beyond their design life.
        - At 50 years, a large concrete dam “would most probably begin to express signs of ageing.”
    - **Ageing signs include** increasing cases of dam failures, progressively increasing costs of dam repair and maintenance, increasing reservoir sedimentation, and loss of a dam’s functionality and effectiveness - “strongly interconnected” manifestations.
    - 32,716 large dams **(55% of the world's total)** are **found in just four Asian countries**: China, India, Japan, and South Korea - a majority of which will reach the 50-year threshold relatively soon.
        - The same is true of many large dams in Africa, South America, and Eastern Europe.
- **Indian Scenario:**
    - **India is ranked third** in the world in terms of building large dams.
    - Of the over 5,200 large dams built so far, about **1,100 large dams have already reached 50 years of age** and some are older than 120 years.
        - The **number of such dams will increase to 4,400 by 2050**.
    - This means that **80% of the nation’s large dams face the prospect of becoming obsolete** as they will be 50 years to over 150 years old.
    - The **situation with hundreds of thousands of medium and minor dams is even more dangerous** as their shelf life is even lower than that of large dams.
    - **Examples: Krishna Raja Sagar dam was built in 1931** and is now 90 years old. Similarly, **Mettur dam was constructed in 1934** and is now 87 years old. Both these reservoirs are located in the water scarce **Cauvery river basin**.

- **Problems:**
    - **Decreasing Storage Capacity:**
        - As dams age, **soil replaces the water in the reservoirs**. Therefore, the storage capacity cannot be claimed to be the same as it was in the 1900s and 1950s.
        - The storage space in Indian reservoirs is receding at a rate faster than anticipated.
    - **Flawed Design:**
        - Studies show that the **design of many of India's reservoirs is flawed**.
        - Indian reservoirs are **designed with a poor understanding of sedimentation science**.
        - The designs **underestimate the rate of siltation and overestimate live storage capacity** created.
    - **High Siltation Rates:**
        - It refers both to the increased concentration of suspended sediments and to the increased accumulation (temporary or permanent) of fine sediments on bottoms where they are undesirable.
- **Consequences:**
    - **Less Water:**
        - When soil replaces the water in reservoirs, supply gets choked. The **cropped area begins receiving less and less water** as time progresses.
    - **Impact on Groundwater:**
        - The net sown water area either shrinks in size or **depends on rains or groundwater, which is overexploited**.
    - **Affecting Farmers' Income:**
        - The farmer's income may get reduced as **water is one of the crucial factors for crop yield along with credit, crop insurance and investment**.
        - It is important to note that **no plan on climate change adaptation will succeed with sediment packed dams**.
    - **Frequent Flood:**
        - The designed **flood cushions within several reservoirs across many river basins may have already depleted** substantially due to which **floods have become more frequent downstream of dams**.
        - The **flooding of Bharuch in 2020, Kerala in 2018 and Chennai in 2015** are a few examples attributed to downstream releases from reservoirs.
- **Step Taken:**
    - Recently, the Cabinet Committee on Economic Affairs has approved the **Dam Rehabilitation and Improvement Project (DRIP)** Phase II and Phase III.
        - It envisages **comprehensive rehabilitation of 736 existing dams** located across the country and complements the **Dam Safety Bill, 2019**.

Way Forward

- The nation will eventually be **unable to find sufficient water in the 21st century** to feed the rising population by 2050, grow abundant crops, create sustainable cities, or ensure growth. Therefore, **it is imperative for all stakeholders to come together to address this situation urgently**.
- A **preventive mechanism to avoid dam failures** is necessary because if a dam fails, no amount of punishment can compensate for the loss of lives.
- **Dam decommissioning should be seen as equally important as dam building** in the overall

planning process on water storage infrastructure developments.
- **With the changing climate,** it has become absolutely essential to really think about the issue of water carefully and proactively.

Source: TH

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