



E-flow Monitoring System

For Prelims: [Environmental flows](#), [National Mission for Clean Ganga](#), [Namami Gange programme](#), [Biodiversity Conservation](#), [Biodiversity Conservation](#), [Geographic Information Systems](#).

For Mains: Key Features of the E-flow Ecological Monitoring System, Issues Related to Namami Gange programme.

[Source: TH](#)

Why in News?

Recently, the [Union Jal Shakti Ministry](#) has introduced an innovative [Environmental flows \(E-flows\) Monitoring System](#) designed to facilitate real-time monitoring of river water quality and support the planning and oversight of projects related to river ecosystems.

- This system aims to enhance the management of water resources and environmental flows in key Indian rivers, including the **Ganga and Yamuna**.

What is Environmental Flow?

- **About: Environmental flow (E-flow)** is the **quantity, timing, and quality of water flows** required to maintain the health and functioning of aquatic ecosystems and support the livelihoods that depend on these ecosystems.
 - E-flows are essential for sustaining the **ecological integrity of rivers, lakes, and wetlands**, ensuring that they can continue to provide important ecosystem services.
- **Key Aspects of Environmental Flows:**
 - **Quantity:** Ensuring an adequate **volume of water is maintained to support the ecological processes** and species within the ecosystem.
 - **Timing:** Preserving the **natural variations in water flow**, including **seasonal and inter-annual fluctuations**, to mimic the natural hydrological cycle.
 - **Quality:** Maintaining **water quality standards that are suitable for the health** of the aquatic ecosystem, including **appropriate levels of dissolved oxygen, temperature, and nutrient concentrations**.
 - **Frequency:** Ensuring that specific flow conditions (such as **high flows, low flows, and flood events**) occur with a regularity that supports the life cycles of aquatic species.

What are the Key Features of the E-flow Ecological Monitoring System?

- **About:** The E-flow Monitoring System was developed by the [National Mission for Clean Ganga](#), a division of the Jal Shakti Ministry.
 - The introduction of this system follows the **2018 mandate by the Centre to maintain**

minimum e-flows in various stretches of the Ganga throughout the year.

- This mandate was a response to concerns from environmental groups about the negative impact of dams on river ecology and flow.

▪ **Key Features:**

- **Real-Time Monitoring:** The system allows for the continuous analysis of water quality in the **Ganga, Yamuna, and their tributaries**.
- **Centralised Oversight:** It enables the monitoring of activities under the [Namami Gange programme](#), particularly the performance of Sewage Treatment Plants (STPs).
- **Comprehensive Data Analysis:** Utilises quarterly reports from the **Central Water Commission** to track in-flow, out-flow, and mandated E-flow across 11 projects along the Ganga Mainstream.

What is the Namami Gange Programme?

- **About:** It is an **Integrated Conservation Mission**, approved as 'Flagship Programme' by the **Union Government** in June 2014 to accomplish the objective of **effective abatement of pollution, conservation and rejuvenation of National River Ganga**.

▪ **Main Pillars:**

- [Sewerage Treatment Infrastructure](#)
- River-Front Development
- River-Surface Cleaning
- [Biodiversity Conservation](#)
- [Afforestation](#)
- Industrial Effluent Monitoring
- Ganga Gram
- Public Awareness

- However, despite its ambitious goals and substantial funding, the Namami Gange Programme is falling short of its targets .

Why is the Namami Gange Programme Falling Short of its Goals?

- **Delays in Project Execution:** Many sewage treatment projects have faced delays due to issues with land acquisition and the need for revisions in **Detailed Project Reports (DPRs)**.
 - These challenges have slowed down the commissioning and operationalisation of crucial infrastructure and thereby falling short of desired objectives.
- **Funding and Budget Allocation:** Although the programme has received in-principle approval for projects worth **Rs 37,396 crore**, only **Rs 14,745 crore** has been released to the states for infrastructure work.
 - This discrepancy between approved and disbursed funds has hindered the timely completion of projects.
- **Insufficient Sewage Treatment Capacity:** Despite significant investments, the programme has only managed to install treatment plants capable of treating about **20% of the sewage generated** in the five major states along the Ganga.
 - This capacity is expected to increase to only **33% by 2024** and **60% by 2026**, falling short of the needs based on current and projected sewage generation.
- **Persistence of Industrial Pollution:** The program has struggled to address the issue of industrial pollution effectively.
 - **Many industries located along the Ganga** continue to discharge untreated effluents, contributing to the river's pollution.
 - According to the recent government estimates, about **402.67 million liters per day (MLD)** of industrial effluents by **3,186 grossly polluting industries (GPI)** are discharged into rivers Ganga and Yamuna.

What Measures can be Adopted to Enhance Conservation and Rejuvenation of Ganga River?

- **Leverage Technology for Monitoring and Data Management:** Utilise advanced technologies, such as [remote sensing](#), [Geographic Information Systems \(GIS\)](#), and **real-time monitoring**

systems, to effectively monitor the progress of the program and the health of the Ganga River.

- Develop a centralised data management platform to integrate data from various sources, enabling informed decision-making and adaptive management.

▪ **Adopt-a-Ghat Initiative:** Partnering with NGOs and local communities to launch an "Adopt-a-Ghat" program.

- Owner Groups can be held responsible for the cleanliness and beautification of specific ghats (**riverfront steps**) along the Ganga, fostering a sense of ownership and community involvement.

▪ **Riverine Economy Incentives:** Creating a "Ganga Riverine Economy" certification for businesses that adopt practices that minimise pollution and promote sustainable water usage.

- This could **incentivize industries and hotels to become responsible stakeholders** in the river's health.

▪ **Floodplain Restoration:** Identifying opportunities for floodplain restoration projects in the long run. Reconnecting the river with its natural floodplains can **improve water filtration, reduce erosion, and provide critical habitat for aquatic life.**

▪ **Waste-to-Wealth Handicrafts:** Supporting and incentivising the self help groups for the creation of **eco-friendly handicrafts from waste collected along the riverbank.**

- This can generate income for local communities, encourage waste collection, and promote sustainable practices.

Drishti Mains Question:

Discuss the importance of maintaining environmental flows in river ecosystems. How does the e-flow monitoring system contribute to the rejuvenation and conservation of the Ganga River?

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Discuss the Namami Gange and National Mission for Clean Ganga (NMCG) programmes and causes of mixed results from the previous schemes. What quantum leaps can help preserve the river Ganga better than incremental inputs? (2015)