

Ministry of Jal Shakti

Strategic Alliance between NMCG, IIT (BHU) and Denmark unveils innovative Smart Laboratory on Clean Rivers (SLCR) Project in Varanasi

SLCR Secretariat to receive initial funding of Rs. 16.80 crore from Jal Shakti Ministry and additional Rs. 5 crore grant from Denmark to support long-term sustainability and project development

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The Green Strategic Partnership between the Governments of India and Denmark has fostered significant collaboration leading to the establishment of the **Smart Laboratory on Clean Rivers (SLCR)** in Varanasi. The alliance is a unique tripartite initiative between Government of India (Department of Water Resources, River Development and Ganga Rejuvenation), the Indian Institute of Technology - Banaras Hindu University (IIT-BHU), and Government of Denmark, to bring excellence in small river rejuvenation and management.



The SLCR aims to leverage the expertise of both nations to rejuvenate the river Varuna using sustainable approaches. Its objectives include creating a collaborative platform for government bodies, knowledge institutions and local communities to share insights and develop solutions for clean river water. The initiative features a hybrid lab model at the IIT-BHU and an on-field living lab at the Varuna River to test and scale solutions in real-world settings. The SLCR has a robust institutional and appraisal mechanism built into it to ensure the necessary due diligence, rigor in its functioning and for ensuring excellence in river management.

The Indo-Danish Joint Steering Committee (JSC) is the highest forum for SLCR which provides strategic guidance and reviews progress. The Project Review Committee (PRC), with members from National Mission on Clean Ganga (NMCG), Central Water Commission (CWC), Central Ground Water Board (CGWB), IIT-BHU and Denmark's Urban Sector Counsellor, will oversee quality control at project level.

The Multi-Stakeholder Working Group (MSWG), chaired by the District Magistrate and co-chaired by NMCG and IIT-BHU, will coordinate efforts among central and state agencies. The Secretariat, established between NMCG and IIT-BHU, will manage day-to-day activities, project development, and knowledge dissemination. The SLCR Secretariat will receive initial funding of Rs. 16.80 crore from the Ministry of Jal Shakti and an additional 5 crore INR grant from Denmark to support long-term sustainability and project development. The Joint Steering Committee (JSC) chaired jointly by Director General (NMCG), and, First Secretary and Team Lead for Strategic Cooperation has cleared four projects to be taken up under the collaboration.

The commitment includes developing a **Decision Support System (DSS)** for water management to analyse basin water dynamics through hydrological models, scenario generation, forecasting and data analytics. This 2-3-year project will integrate groundwater and hydrological models to create a comprehensive river management plan, with key outcomes including real-time monitoring, data visualization tools and scenario simulations. The DSS will support holistic planning and effective water management.

The second project focuses on the **characterization of emerging pollutants and fingerprint analysis**. Over the next 18 months, this initiative will use advanced analytical techniques, such as chromatography and mass spectrometry, to identify and quantify contaminants. Led by a professor from the University of Copenhagen with international partners, the project aims to create a detailed fingerprint library, enhance water quality monitoring, and propose effective remediation strategies.

A selected stretch of the Varuna River will demonstrate interventions based on a holistic plan and river manual, implementing SLCR's vision of global sustainable solutions. Project ideologies, based on thorough research and consultation, include activities for preserving archaeological and historical heritage. The project, achievable within 2-3 years, aims to enhance regional economic and social development while ensuring good river health.

The final project in the series, the **Hydrogeological Model of the Varuna Basin for Recharge Sites**, aims to enhance base flow through Managed Aquifer Recharge (MAR). Over the next 24 months, the project will use advanced geophysical techniques and mathematical modelling to identify optimal recharge sites and rates. Objectives include integrating Heliborne and FloaTEM data, generating scenarios for water harvesting impacts and developing a comprehensive river-aquifer flow dynamics model to support informed decision-making and water resource optimization.

The SLCR is expected to bring out a unique confluence of academia, sub national and national Government working in partnership with another country to co-create solutions for identified problems and issues pertaining to river health in general and small river rejuvenation in particular.

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