

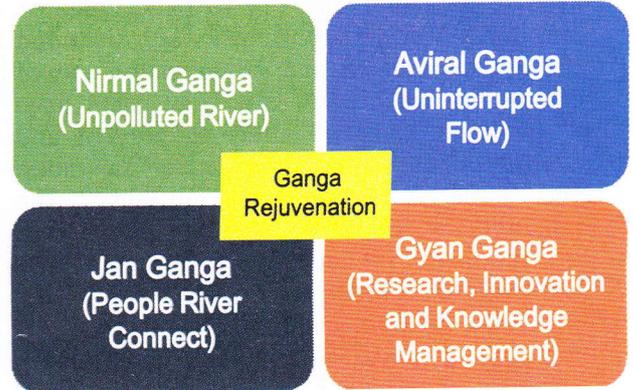
# Impact and Progress of Namami Gange Programme

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Namami Gange programme, implemented by National Mission for Clean Ganga (NMCG) is an integrated mission for conservation of Ganga and its tributaries. A comprehensive Ganga River Basin Management Plan (GRBMP) was developed by a consortium of seven IITs. The vision is to restore the wholesomeness of the River by ensuring Aviral and Nirmal Dhara, and maintaining its geo-hydrological and ecological integrity.

**R**iver Ganga is not only the cultural and spiritual mainstay for India but also provides economic sustenance, water and food security to more than 43 percent of country's population. A part of the collective consciousness of India, Ganga can easily be considered the most revered river across the world. As a representation of India's identity and culture, it became important to restore the river to its clean and pristine glory. Considered as the lifeline for millions of people, River Ganga has been facing several challenges on one hand from pollution of river from different sources with growing urbanisation and industrial growth, and on the other from excess abstraction of water from river for agricultural, industrial and drinking needs.

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its tributaries. A comprehensive Ganga River Basin Management Plan (GRBMP) was developed by a consortium of seven IITs. The vision is to restore the wholesomeness of the River by ensuring Aviral and Nirmal Dhara, and maintaining its geo-hydrological and ecological integrity. This approach differentiates this from earlier attempts. Integrated River Basin Management (IRBM) approach is followed with



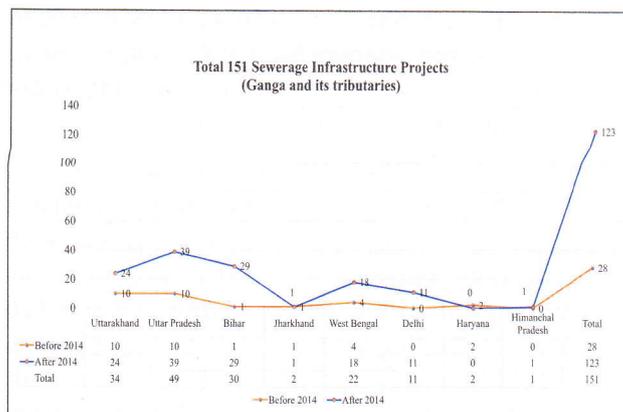
multi-sectoral and multi-agency interventions such as (I) pollution abatement (Nirmal Ganga), (II) improving ecology and flow (Aviral Ganga), (III) strengthen people river connect (Jan Ganga) and (IV) facilitate diversified research, scientific mapping, studies and evidence based policy formulation (Gyan Ganga).

The holistic approach and innovative features in policy making, project management, financial planning, sustainability of investment, scientific research, knowledge management, institutional development, basin management and planning has helped Namami Gange program to evolve as a pioneering river rejuvenation programme. A total of 315 projects have been sanctioned under Namami Gange programme at a cost of Rs. 28,854 crores. 130 projects have been completed and the remaining are in progress. Pace of execution and consequently the expenditure has increased many folds with the expenditure for FY 2019-20 being Rs. 2673.09 crores as compared to Rs. 170.99 crores in FY 2014-15.

### Pollution Abatement (Nirmal Ganga)

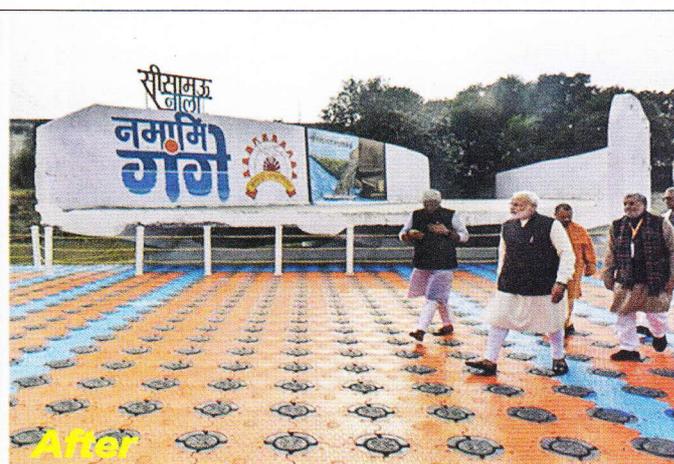
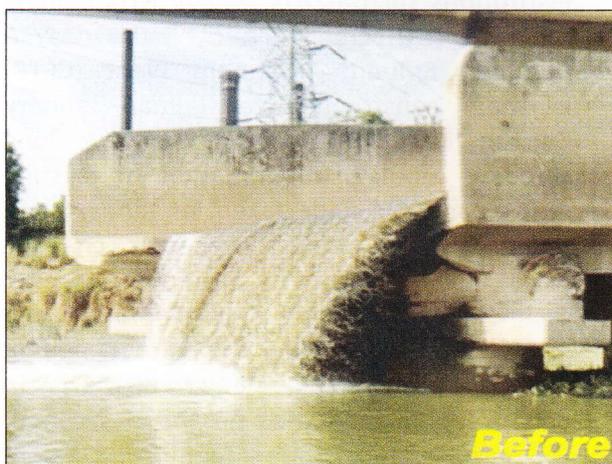
Pollution abatement measures comprehensively tackle all sources of pollution such as municipal sewage, industrial effluents, municipal solid waste, rural sanitation, non-point sources of pollution such as agricultural runoff, open defecation, un-burnt dead bodies etc.

(a) **Sewerage Infrastructure**—The largest source of pollution in Ganga is flow of untreated municipal sewage. The goal of achieving Nirmal Dhara is impossible without building sufficient infrastructure to prevent untreated waste water entering into the river. Under Namami



Gange, a total of 151 sewerage infrastructure projects have been sanctioned to create/rehabilitate 4874 MLD treatment capacity in the Ganga basin. In addition, the mission has done conditional assessment and feasibility study of old infrastructure and taken steps to rehabilitate and upgrade, wherever feasible. The scaled up and assured funding under Namami Gange enabled comprehensive and aggressive interventions. The Figure I indicates the magnitude of scaling up under this mission with a sense of urgency to bridge the past gap between sewage generation and sewage treatment capacity. Not only the number of projects have increased from 28 to 151 but the treatment capacity has increased from 462.85 MLD by almost ten times. 51 projects have been completed. For main stem of Ganga, treatment capacity of 2100 MLD is now available against sewage generation of 2950 MLD from 97 Ganga towns.

More than 80 major drains falling into Ganga have been intercepted and diverted to STPs –new and old.



Stopping discharge of 140 MLD sewage from 120-year-old Sisamau Nala at Kanpur, Kasawan Nala in Haridwar and Chandreshwarnagarnala at Rishikesh are notable examples.

Most of the STPs in Uttarakhand are complete including all projects in Haridwar- Rishikesh area. Core Prayagraj is fully covered with sewerage network and STPs. Varanasi saw completion of 140 MLD Dinapur STP and 120 MLD at Goitha, and 50 MLD STP at Ramana would be ready this year. In Bihar, treatment capacity is being increased by 10 times from about 60 MLD to 650 MLD. In Jharkhand also works are almost complete and several projects in West Bengal too are making good progress.



Learning from past, 15 years long term Operation and Maintenance (O&M) has been included in project cost. Mission has introduced a PPP approach in Hybrid Annuity Mode (HAM) to sewerage infrastructure sector. Under this, 40 percent of capex is paid during construction and balance 60 percent paid in 15 year annuity along with interest with separate payment for O&M. This is to encourage performance based payments and efficient execution. Further, the approach of 'One City-One Operator' has been adapted by integrating the construction of new STPs, rehabilitation of old STPs, if needed and O&M of all for 15 years to improve accountability and governance with city wide contract. This helps meet better performance standards, attracts sound players due to bigger size, opportunity to explore the possibility of reuse of treated waste water and ultimately better service.

Wastewater is one of the most under-exploited resources. It is actually a valuable

resource from which energy, water, organics, phosphates, nitrogen, and other resources can be extracted. NMCG is actively pursuing the development of a model policy framework for re-use of treated waste water. In Mathura, 20 MLD treated waste water has been tied up for use in Mathura refinery, which will meet the costs of TTP, O&M and pay for water. Similarly, efforts are being made to tie up with thermal power plants as per power tariff policy. These are also being used for agricultural purposes and states like Bihar have mandated it. Haryana is developing a state policy. Specific arrangements for discharge lines for agriculture use are being made in all new projects like Ramana at Varanasi or Jagjeetpur in Haridwar. The circular economy principles can help turning sanitation a sustainable option.

- (b) **Faecal Sludge Management** - While improving sewerage systems, the constraints have also been understood from the way our cities and towns are. Faecal sludge and Septage treatment is good option in developing a mix of solutions with centralised and decentralised STPs. While working with several institutions from National Faecal Sludge and septage management alliance such as CSE, ASCI; capacity building of States and ULBs is being done. NMCG has adopted co-treatment in its all under construction STPs. Such practice is already undergoing in important towns such as Haridwar, Kanpur, Prayagraj, Lucknow etc.
- (c) **Industrial Pollution**— To control the industrial pollution in Ganga, all the Grossly Polluting Industries (GPIs) were identified and annual inspection undertaken by independent expert institutions such as IITs, NEERI, NITs leading to improved compliance by industries. A Common Effluent Treatment Plant (CETP) is under construction for Jajmau Tannery Cluster, Kanpur, addressing a very long standing problem. Upgradation of existing CETPs has been undertaken for tannery and textile clusters. Industry specific charters were developed to promote greener technology, reduce effluent generation and reuse/recycle which led to improvement in several industries. Black liquor discharge in paper & pulp industries has been stopped. Online continuous effluent monitoring system

has been installed. Similar approach is being extended to tributaries.

- (d) **Solid Waste Management**– Solid Waste is the most visible form of pollution. The mission has directed its focus on solid waste on ghats and in the vicinity of the river with regular cleaning of river banks, installing screens/filter to trap solid waste, ban on single-use plastics and periodical third-party inspections. Trash skimmers have been installed at important places for surface cleaning. Projects for ghat cleaning have been taken up at Haridwar, Kanpur-Bithoor, Mathura-Vrindavan, Prayagraj and Varanasi.
- (e) **Rural Sanitation**–NMCG facilitated construction of around 11 lakh household toilets in 4465 identified Ganga bank villages. They were declared open defecation free (ODF) early and solid, liquid waste management in Ganga Grams is priority in SBM Grameen.
- (f) **Water Quality** - Central Pollution Control Board monitors water quality of River Ganga through 97 manual stations. For the first time in India, Real Time Water Quality Monitoring has been introduced with 36 stations set up along Ganga with 40 more in pipeline. Community monitoring is also promoted. The impact of the program is reflected in the improving trend of water quality. The important parameter of Dissolved Oxygen (DO) to be more than 5mg/liter is now met throughout the river length. There is improvement in meeting Biological Oxygen demand (BOD), to be less than 3mg/liter at several stations. The Kumbh at Prayagraj in 2019 was witness to improved water quality and cleanliness.

### Ecology and Flow (Aviral Ganga)

Drastic reduction in flow of river has a huge ecological cost with long term adverse impact. A river is not a river without good flow. NMCG is working on improving flow and overall ecology through a mix of supply as well as demand side management of water.

- (a) **Ecological Flow**-For the first time, ecological flow was notified for River Ganga in October 2018, formally establishing the right of river over its own water with far reaching implications for river health. This has become a major component of

river rejuvenation study and studies are ongoing for other rivers like Yamuna, Ramganga etc.

- (b) **Wetland Conservation**–Wetlands are important for Nirmalta, Aviralta and also for economy, eco-tourism, ground water recharge and supporting biodiversity. Mission is working for their protection and conservation and integrating to basin level. Toolkits for urban wetlands protection are also being developed with special attention to flood plain wetlands. 226 wetlands within 10 kms from Ganga in 27 districts in UP have been taken up for development of an integrated management plan.
- (c) **Afforestation**: For the first time, mission got a scientific plan for afforestation along entire length of Ganga developed by Forest Research Institute and started its implementation. Natural, urban and agricultural riverscapes are covered in this plan. Taking it as a model approach, MoEF&CC is extending similar approach for 13 more rivers in the country.
- (d) **Biodiversity Conservation** - A comprehensive project is under implementation with Wildlife Institute of India (WII) to map biodiversity hotspot for the entire length of Ganga and scientific improvement of habitat, species. NMCG spearheaded campaign for conservation of Gangetic Dolphin, the National Aquatic Animal leading to announcement of Project Dolphin. A comprehensive scientific program for fisheries resource and their conservation has been taken up in association with Central Inland Fisheries Research Institute (CIFRI).



- (e) **Sustainable Agriculture**: NMCG promotes this through organic farming, eco agriculture and medicinal plantation. Organic farming corridor along Ganga has been proposed

at the National Ganga Council meeting for sustainable development. Promotion of cultivation of medicinal plants has been taken up in 10 districts of UP. Ministry of Ayush and National Medicinal Plantation Board is supporting development of herbal corridor along Ganga. Improving water use efficiency in agriculture is aimed through awareness campaign, promoting micro-irrigation, policy interventions for cropping pattern etc.

- (f) **Small River Rejuvenation:** A GIS based district wise inventory of small rivers is being created along with district level interventions with convergence with MGNREGA. Small rivers rejuvenation is key to Aviral and Nirmal Ganga.

### People River Connect (Jan Ganga)

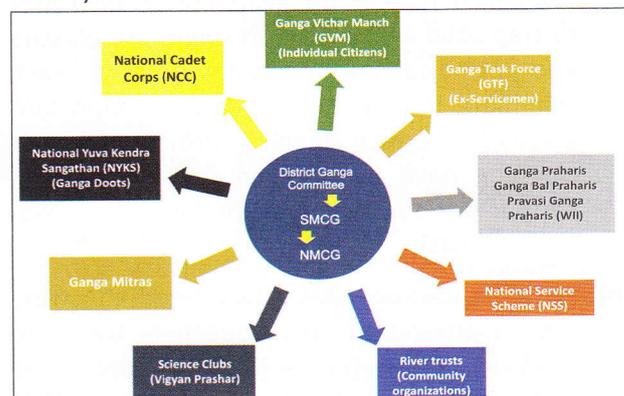
River Rejuvenation is a continuous process which needs involvement of the people. The people river connect needs to be established so that they feel the need to join these efforts and are committed to maintaining her splendour and cleanliness. Namami Gange mission accords prime importance to this and is taking several steps for making it a people's movement.

- (a) **Ghat and Crematoria**—They play a crucial part in people's relation with river Ganga and hence attempt is made to improve amenities and sanitation. 138 Ghats and 38 Crematoria have already been constructed with River Front development at Patna and Haridwar, making them important public space.



- (b) **Jan Bhagidari**—Community and stakeholder groups have been developed such as Ganga Vichar Manch, Ganga Praharis, NYK Ganga Doots, Ganga Mitras, Ganga Task Force with ex-serviceman, NCC, NSS etc. They undertake several activities continuously to connect people.

- (c) **Ganga Amantran Abhiyan**—This was largest social outreach program through adventure sports connecting people from Deoprayag to Ganga Sagar last year through 35-daylong rafting expedition. A similar successful expedition up to Patna from Haridwar was led by Mountaineer Bachendri Pal in 2018.



- (d) NMCG regularly conducts several activities to connect youth and others such as 'Great Ganga Run', a marathon which was attended by around 20,000 people and regular Cleanathons on river banks.
- (e) **Ganga Quest:** During lockdown, an innovative online national quiz on Ganga to connect school/college students drew overwhelming response with 11.5 lakh participants. Ganga Utsavs, Ganga Bal Mela, Cultural programmes and other activities are organised suitably connecting different group of people.
- (f) **Clean Ganga Fund** is another innovative step to create an avenue for people and corporates to donate and take up specific projects for this national cause.

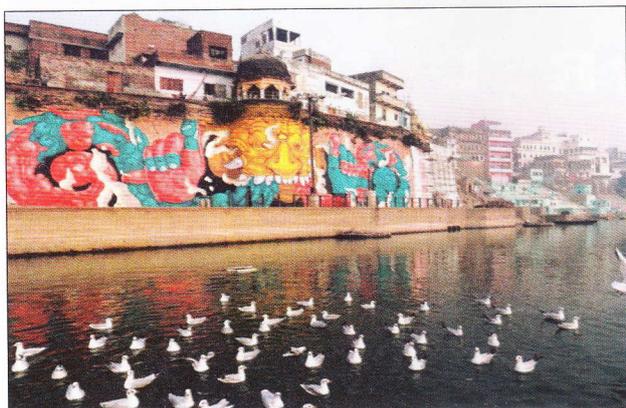
### Research, Policy and Knowledge Management (Gyan Ganga)

Mission has given priority to evidence based policy decisions and to get authentic data and information backed by scientific research. It started with a comprehensive basin management plan prepared by consortium of IITs followed by setting up of a Centre for Ganga Management and Studies (cGanga) at IIT, Kanpur. Some of the initiatives are outlined.

- (a) **LIDAR Mapping**—A landmark project with Survey of India is progressing for Generation of high-resolution DEM and GIS ready database for 10 kms on both sides of Ganga using LiDAR

which will for the first time provide data on drainage, flood plains etc. This will enable better project formulation, monitoring, regulation and conservation.

- (b) **Microbial Diversity Mapping** - Namami Gange in partnership with CSIR-NEERI is studying Water Quality and Sediment Analysis to understand the Special Property of Ganga River and also impact of human intervention on microbial diversity.
- (c) **Cultural mapping** of entire length of Ganga for natural, built and intangible heritage, taken up through INTACH, has the potential for protection of rich heritage and development of tourism and traditional livelihood opportunities.



- (d) **Climate Scenario Mapping**—Partnering with IIT, Delhi to map out high resolution long term climate scenarios to improve understanding and scientifically estimate impact of climate change on water resources in the Indo-Gangetic Plain for basin-scale water resources management
- (e) **Spring Rejuvenation**-Namami Gange is leading spring rejuvenation projects with IIT, Roorkee and Survey of India to assess the impact of land use-land cover change or impact of natural or anthropogenic precipitation variability and mapping of sources of springs for taking up their rejuvenation. It is likely to be base for a major program for Himalayan Spring Rejuvenation by NITI Aayog.
- (f) A project in collaboration with CGWB and National Geophysical Research Institute (NGRI) for aquifer mapping has been started with focus on paleo-channels in parts of Ganga-Yamuna doab in Kausambi-Kanpur stretch.

This will help in planning for aquifer recharge with potential for increasing the flow of river Ganga during lean season.

- (g) **New Paradigm of Planning for River Cities** – Project to mainstream river health in urban planning and develop framework for Integrated Urban Water Management (IUWM) has been initiated with National Institute of Urban affairs. Innovative urban river management plan (URMP) framework is being developed with a template for Kanpur.
- (h) Namami Gange is collaborating with different international organisations like India-EU water partnership and German collaboration for the technology and knowledge transfer for River Basin management, E-flow assessment and Policy for Reuse of treated wastewater.
- (i) Arth Ganga- Namami Gange is now leading to the development of Arth Ganga model linking economic development of Ganga Basin with ecological improvement and Ganga Rejuvenation.

The nature has capacity to rejuvenate itself if human interventions are controlled and the same was witnessed during the national lockdown period. The lesson to be learnt is that we need to have a better enforcement and also keep working for behavioural change as everything cannot be achieved by regulatory approach only. People's participation is key to transformation. Sustainable development increasingly depends upon successful management of urban growth and water resources. Ganga Rejuvenation is critical for implementation of 2030 agenda of Sustainable Development Goals (SDGs). Namami Gange has developed a framework for river rejuvenation which is now being followed for several rivers beyond Ganga basin.

Ganga is in the heart of millions who have been drawn to it since time immemorial. In essence, Ganga represents all rivers and several river streams are also named after Ganga. It has always been and will remain a great unifying force. Its rejuvenation requires the efforts of all and its rejuvenation is needed by all.

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