CLASS NOTES
NAMAMI GANGE

- Initiatives to clean the Ganga began with the Ganga Action Plan I in 1986. Till 2014, over Rs 4,000 crore had been spent.
- But the river has remained dirty. So when the National Democratic Alliance government launched the Namami Gange in mid-May 2015, there was a new hope.
- It was the biggest-ever initiative—over Rs 20,000 crore was allotted. Prime Minister made it his personal agenda and set a deadline: "Ganga will be clean by 2019", it has now been extended to 2020.
- Namami Gange is being implemented by the National Mission for Clean Ganga (NMCG), & its state counterparts—State Programme Management Groups. NMCG would establish field offices wherever necessary.
- The National Ganga Council (NGC) was created with Prime Minister as its head. This council replaced the National Ganga River Basin Authority (NGRBA).
- The Ganga basin constitutes 26% of the country's land mass & supports 43% of India's population.
- The NMCG has stated its vision in terms of four restoration pillars : – Aviral Dhara (continuous flow), Nirmal Dhara (clean water), Geologic Entity (protection of geological features) and Ecological Entity (protection of aquatic biodiversity).
- According to the Central Pollution Control Board (CPCB)'s 2014 estimates, approximately 8,250 million litres per day (MLD) of wastewater is generated from towns in the Ganga basin, while treatment facilities exist only for 3,500 MLD & roughly 2,550 MLD of this wastewater is discharged directly into the Ganga.
- NGC would have on board the chief ministers of five Ganga basin states—Uttarakhand, Uttar Pradesh (UP), Bihar, Jharkhand & West Bengal—besides several Union ministers & it was supposed to meet once every year.
- The Water Resources, River Development & Ganga Rejuvenation Ministry signed Memoranda of Understanding (MOUS) with 10 other ministries to synergise the activities under the Namami Gange.
- The govt said it would involve grassroots level institutions such as urban local bodies & panchayati raj institutions to implement the programme.
- An Empowered Task Force, headed by Union Water Resources Minister, was created & it has on board the chief secretaries of the five Ganga Basin states.
- It was supposed to meet once in every three months.
- State Ganga Committees have been formed, which would be the nodal agency to implement the programmes in a state.
- Besides, these committees would conduct safety audits of the river & take remedial measures.
- The Centre said that it establish a 4-battalion Ganga Eco Task Force to spread awareness about pollution & protecting the river.
- The govt is contemplating a legislation to arrest & fine those found flouting norms.
- The govt also tasked seven Indian Institutes of Technology (IITs) to prepare a report on the best strategies to clean up the river.
- IITs batted for a Ganga basin approach, which meant not only cleaning the Ganga, but its tributaries as well.
- The report, Ganga Rejuvenation Basin Management Programme (GRBMP), submitted in March 2015, says that instead of establishing a few projects on the stretch of the Ganga, the whole river basin—that is all the states coming under the main stem of Ganga and its tributaries—must come under the ambit of the programme.
- The CAG, in its report of 2017, said, "The NMCG neither circulated GRBMP report to different ministries/departments for consultation & seeking their opinion, nor finalised the GRBMP for initiating the long-term intervention on the Ganga."
- The document on NMCG website talks about the towns under consideration for pollution abatement belong to five states on the main Ganga stem—Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal—and not the ones which lie on the tributaries of the Ganga.
- This would entail addressing untreated waste that flows into the river, restoring the flow of the river, sludge management in Ganga basin towns, cost overruns in execution of projects and governance glitches.

SEWAGE TREATMENT

- Sewage treatment plants (STPs) have been at the centre of Ganga pollution abatement.
- As per Namami Gange targets, STPs with over 2,000 million litres a day (MLD) capacity had to be rehabilitated of which only 328 MLD have been done.
- A look at the status of all the projects undertaken makes one doubt whether the govt would even achieve its revised deadline.
- 68 sewage infrastructure projects projects were sanctioned after the Namami Gange was approved by the cabinet & only six were completed till August 2018.
- Till August 31, 2018 a total of 236 projects, including STPS, had been sanctioned out of which only 63 had been completed.

- The govt has said that the new projects are delayed because land acquisition and other related activities were taking a lot of time. However, poor performance in rehabilitating old STPs does not stand the test of time scarcity.
- The issue is just not with the construction or rehabilitation of STPs but also their performance.
- Every STP installed has design parameters for Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS).
- STP at Kanpur, which holds the dubious distinction of being home to the "most polluted stretch" of the Ganga.
- The 5 MLD domestic waste water treatment plant at Jajmau in Kanpur had BOD and TSS level in effluents as 65 mg/litre (against design parameter of 30) and 92 mg/litre (against design parameter of 50), according to the April-May 2018 report of Kanpur Jal Nigam.
- The report says that BOD & TSS levels of the effluent is higher than the norms because industrial waste & chemicals are illegally mixed with the influents in a plant not meant to treat industrial pollutants.
- Another problem with STPs is that they are not able to get the total amount of influents, primarily due to lack of sewerage network in the city.
- A total network of 2,071 km of new sewer line projects was sanctioned after Namami Gange came into being but only 66.85 km has been laid.
- The STP that treats domestic waste water in Kanpur's Jajmau has a capacity of 130 MLD but in average was only 60.5 MLD. According to NMCG, all the existing plants in Kanpur have a capacity of 414 MLD but are getting only 230 MLD as influents.
- STPs are being designed according to their sewage generation.
- The problem lies in the way sewage generation is estimated. "The estimation of sewage generation is based on the assumption that 80% of the water supplied is returned as waste water.
- Some recent data compiled by Central Pollution Control Board (CPCB) shows that actual measured discharge of waste water into Ganga is 6,087 MLD, 123 per cent higher than the estimated discharge of wastewater.
- V K Mishra, president of Varanasi's Sankat Mochan Foundation (SMF), reiterates that the very methodology of calculating sewage generation is faulty.
- The industry, especially the tanneries in Kanpur's Jajmau area have several times attracted the wrath of both the Supreme Court & NGT.
- The govt of UP said to NGT on March 30, 2017 that it has, taken a decision to shift the tanneries from Jajmau to some other place that is under consideration.
- However, the govt was also open to the idea of installing appropriate anti-pollution devices, including a chromium recovery plant.
- It is mandatory that tanneries treat chromium either through their own small plant or a made in cluster & then transfer the waste to a Common Effluent Treatment Plant (CETP) run by the govt.
- According to the UP govt in NGT there are three clusters housing tannery industries—Jajmau, Unnao & Banther.
- Jajmau has the maximum concentration of 400 tannery industries
- According to NGT, industries at Jajmau are discharging much more than 9 MLD industrial effluents, mainly containing chromium
- Uttar Pradesh Pollution Control Board did not enforce industries to send their chrome liquor to the Chrome Recovery Plant & pay for the treatment.
- According to NGT, Industries are disposing their entire waste, including the chrome liquor, in the common drain."
- It says that chromium concentration in tannery effluent is 110.2 mg per litre.
- There is no board outside any of the four tanneries right on the bank of Ganga in Wajidpur village & they seem to be running almost anonymously. One can see that they are discharging waste into the Ganga.
- Namami Gange also talks about afforestation as an important activity as it helps groundwater recharge.
- According to NMCG, it has already spent Rs 114 crore on afforestation but to no avail.
- They have planted kachnaar and gulmohar plants. They can only be used for decorative purposes.
- What is required for the Ganga is bargad, peepal, gular & neem as they help in better conservation of water."

RESTORING THE FLOW

- During the monsoons the water level in Ganga is good enough.
- There is not even knee deep water in summer. People graze cows, learn driving and play cricket on the surface of Ganga
- Even the fish die in summer due to lack of water. People coming to ghats usually don't go for boat rides in summer
- B D Tripathi, in-charge of Banaras Hindu University's Ganga Research Centre, says, "The water level in the river is going down at an unprecedented rate.
- Also if the flow in the river is maintained it can solve the problem of 60-80% of organic pollutants & we may not require such an elaborate programme."
- According to B D Tripathi , Ganga has three special properties because of the path it treads naturally. "The Ganga has medicinal properties that can treat skin infections. These properties come due to medicinal plants on the path of Ganga. Also the

Ganga is very rich in minerals & has bacteriophages which kill the bacteria.

- If you chain the Ganga with barrages & canal diversions and therefore alter its natural path, it will lose these properties."
- He says due to restrictions and decrease in flow, the velocity of water decreases and siltation increases and therefore minerals of the water settle down at the riverbed.
- According to , IIT-Kharagpur's Abhijit Mukherjee (August 2018) which says that according to their estimates the baseflow amount of the river has decreased by 56% in 2016 as compared to the 1970s.
- The decrease in flow has led to an increase in groundwater extraction for various uses.
- According to a report published by Wildlife Institute of India in May 2018, 16 existing, 14 ongoing and 14 proposed hydroelectric projects on the Bhagirathi & Alaknanda river basins have turned the upper stretch of the Ganga "ecological deserts".
- To deal with these projects, A K Gosain, professor at IIT-Delhi & a member of the panel that has drafted the Ganga protection law, says, "The designs of hydroelectric projects can be tweaked in such a manner that they consume less water.

SLUDGE CONTROL

- A staggering 99.93% villages lying on the banks of Ganga, also known as Ganga Grams, have been declared open defecation free (ODF) by the govt under the Swachh Bharat Mission (SBM).
- As per SBM data, more than 2.7 million toilets have been constructed in over 4,000 villages till September 17, 2018. Not surprisingly, CAG in its December 2017 report casts aspersions on the claim.
- The report said the state govt was to verify the ODF status through its own teams or through a third party but 1,144 villages of UP & Bihar didn't get it done
- Against the standard of 2,500 per 100 ml, the faecal coliform ranged from 2,500 to 2,40,000 per 100 ml in the Ganga basin cities in May 2018, as per data provided by pollution control boards of five states along the Ganga basin.
- Centre for Science & Environment (CSE), a Delhi-based non-profit, showed that about 180 MLD sludge would be generated in five Ganga basin states when they become ODF.
- What should cause further concern is that faecal sludge is a bigger pollutant than sewerage.
- Experts say that while toilets were constructed, hardly a thought was given to management of sludge.
- According to a study conducted by CSE, most of the cities surveyed had twin-pit technology which is not recommended in low-lying areas.
- The National Policy on Faecal Sludge and Septage Management (FSSM) 2017 also anticipated the challenge as more and more toilets are constructed.
- As urban households without toilets obtain facilities under SBM, it is likely that many will acquire on-site arrangements like pit latrines and septic tanks in cities at locations where sewerage systems are not available.
- Thus, while the containment of human waste will be largely achieved, its safe disposal still poses a huge challenge
- What was required along with construction of toilets was several interventions to manage sludge, which clearly did not happen."
- Even septic tanks don't seem to be working out due to laxity. An International Water Management Institute (IWMI) paper published in January 2017 after studying three Ganga basin cities—Gangaghat, Mugalsarai and Unnao—says, "Most households (up to 97%) rely on septic tanks, but these are not properly maintained.
- Septage is collected every 10-15 years, even though collection every three years is the recommended practice for optimal septic tank performance.
- Consequently, septic tanks that could potentially remove 60% of suspended solids & 40% of the organic matter from domestic wastewater have almost no treatment capacity.
- Pollution from the cities flows through a network of small & progressively larger open drains, which eventually flow into the Ganga.
- None of the three cities has a scheme for management of solid waste, most of which is dumped in the streets, clogging open drains & adding to the pollution load.
- Only a fraction of this waste is collected by the Nagar Palika Parishads and dumped at the city limits without treatment or recycling.

COST OVERRUNS

- Cleaning up the massive stretch of 2,525 km that the Ganga traverses is a programme where regulating the finances becomes as big an issue as any other.
- The UP State Annual Action Plan, 2016 says that the Ganga basin towns would require Rs 5,794 crore just for the creation of sewerage networks in the state—more than one-fourth of the entire outlay of Namami Gange.
- As per this model, 40% of the capital cost quoted would be paid on completion of construction while the remaining 60% will be paid over the life of the project as annuities along with operation & maintenance expenses.
- This payment is linked to the performance of the STPs—the quality of the water treated by it.
- The report of the IIT consortium had also pitched for a model whereby the service provider receives

remuneration for providing "reusable-quality water over a reasonably long contract period
- Sample case of STPs to be built in Varanasi with the assistance of Japan International Cooperation Agency (JICA).
- It was sanctioned on July 14, 2010 at a cost of Rs 496 crore with a deadline for completion in 2017-18, with some parts to be completed in 2016.
- The situation was exactly the same by December 2015. STP construction was completed by 34% in December 2016.
- Then the govt issued a revised sanction of the project & pegged the cost at Rs 641.19 crore with a revised deadline of June 2018.
- That deadline could also not be met & it was revised to October 2018 - Bihar has similar cases.
- A 17 MLD STP was sanctioned in the state's Begusarai district on March 8, 2010 at a cost of Rs 65 crore. The project is aided by the World Bank. The NMCG documents reveal no progress took place till December 2016, the original deadline.
- In December 2017, the tender was cancelled.
- Revised sanction was issued in March 2018 with escalated cost of Rs 230 crore and a deadline of January 2020 & it has now become a project of the Central government.
- CAG pointed out poor financial management for the programme in its December 2017 report. It said, "Only 8 to 63% of the funds were utilised during 2014-15 to 2016-17 for the river clean-up programme."
- A corpus of Rs 198.14 crore (as of March 31, 2017) was available in the Clean Ganga Fund. It is a fund under which entities or a commoner can contribute for the Ganga clean up.
- However, NMCG could not utilise any amount out of the Clean Ganga Fund and the entire amount was lying in banks due to non-finalisation of action plan.
- NMCG replied (on August 2017) that after its constitution as an authority and its operationalisation by December 2016, the pace of various projects has accelerated.
- However, NMCG documents reveal that till August 31, 2018 though projects worth Rs 22,323 crore have been sanctioned but total funds utilised were only 23 per cent of it.
- The CAG also came down heavily on Centre for spending injudiciously on media blitzkrieg.
- CAG observed that NMCG hired other advertising agencies & incurred an expenditure of Rs 2.46 crore, which include Rs 36.06 lakh and Rs 5.23 lakh as agency commission and service tax.
- This was in violation of government policy and resulted in avoidable payment, the CAG said.

GOVERNANCE GLITCHES

- The cleaning of the Ganga requires seamless coordination between the agencies responsible for carrying out different tasks.
- This calls for vision and a clear-cut governance strategy. The water resources ministry signed MOUS with 10 ministries for better implementation.
- However, till date no detail is available as to how these ministries are functioning for better convergence.
- Vinod Tare of IIT-Kanpur says, "The Ganga Action Plans lacked the coordination of ministries. It is still lacking in Namami Gange.
- The draft Ganga protection law is with the govt but experts question its utility. What is required is an autonomous body for the rejuvenation of Ganga which is independent of the government when it comes to its functioning.
- Instead of bureaucrats, it should consist of experts well-versed with the river," says environmentalist G D Agrawal, the 86-year-old former IIT-Kanpur professor who is on an indefinite fast to save the Ganga from June 22, 2018.He recently died during his indefinite fast .
- The gazette notification by the Ministry of Water Resources, River Development and Ganga Rejuvenation, issued on October 7, 2016 read: "The NGC shall meet at least once every year or more as it may deem necessary.
- The Empowered Task Force led by Union minister of water resources has met only thrice after the gazette notification
- The mandatory exercise of conducting an annual Ganga safety audit has not been done regularly.
- Also the top post of NMCG is working like musical chairs with seven senior officers appointed since 2014. The first head Rajiv Ranjan Mishra is back at the helm after five changes.
- Every chief came with his own micro-planning, the moment those plans would start taking shape there was a transfer. This is one of the prime reasons for the underperformance of NMCG."
- It is highly centralised as of now with the government sitting at the top deciding what to do.
- People who are living in the Ganga basin have to be involved to achieve the required results. The programme can't succeed unless it has a bottom-up approach."
- The National Green Tribunal (NGT) in November 2019 had imposed a penalty of Rs 10 crore on the Uttar Pradesh (UP) government for failing to check sewage discharge containing toxic chromium into the Ganga at Rania & Rakhi Mandi in Kanpur.
- It also imposed a penalty of Rs 280 crore on 22 tanneries for causing pollution.
- Water in India is a state subject & water management is not a truly knowledge-based practice.
- The management of the Ganga lacked basin-wide integration and is not very cohesive between various riparian states.

- Further, there is a greater challenge of upgrading the water supply & wastewater treatment infrastructure in the designated smart cities and of providing clean water supply to all rural households by 2024 under the Jal Jeevan Mission.
- Ganga Council headed by Prime Minister (PM), in its first meeting held on December 14, 2019, floated a plan to promote sustainable agriculture in the Gangetic plain by promoting organic clusters in a five-km stretch on both sides of the Ganga basin in Uttarakhand, UP, Bihar, Jharkhand & West Bengal.

CURRENT STATUS

- Since 2014, the Centre had taken up 409 projects with a budget outlay of Rs 32,912.40 crore to clean up the river
- At least 71% of the river's monitoring stations reported alarming levels of faecal coliform in January 2023. The actual share is most likely higher, as the Central Pollution Control Board (CPCB) tested samples from only 59 of the 97 stations, or just 61 per cent of the river in January 2023.
- Faecal coliforms are a group of bacteria found in the gut and faeces of warm-blooded animals. Their presence indicates that the water has been contaminated with the faecal material of humans or other animals
- While Uttarakhand had permissible levels of faecal coliform at all 12 tested stations, numbers in three other states — Uttar Pradesh, Bihar and West Bengal — are alarming.
- No samples were collected from Jharkhand.
- Bihar & West Bengal had unhealthy levels of faecal coliform at all 37 monitoring stations.
- In Uttar Pradesh, five of the 10 monitored stations had high levels of pollution, showed data accessed by under the Right to Information (RTI) Act.
- Of the 42 polluted stations, 34 had faecal coliform over 11,000 most probable number (MPN) per 100 ml, which is four times the permissible limit (less than 2,500 MPN per 100 ml).
- Seven stations, all in Bihar, had 92,000 MPN per 100 ml, nearly 37 times the permissible limit.
- State pollution control boards collect manual samples twice a month at most stations.
- CPCB shared data for 2021, 2022 and 2023 (January) under the RTI query.The agency identified the polluted stations. Many of these were not monitored in January 2023.
- In Uttar Pradesh, the faecal coliform levels in 2022 remained high across seven stations: Bathing ghat (Jajmau Bridge), Kanpur downstream, Mirzapur downstream, Chunar, Varanasi downstream at Malviya bridge, Gomti river Bhusaula and Tari ghat in Ghazipur. Three of these were not monitored in January 2023.
- CPCB analysis for 2022 says faecal coliform was high "at almost all the monitoring locations in Bihar & West Bengal".
- In January 2022, West Bengal had samples from 14 stations and all had high faecal contamination.
- In January 2023, the state monitored just five stations.
- Bihar collected samples from 32 stations in both years. In January 2022, three of them had permissible faecal coliform levels. A year later, even they were contaminated.
- On July 22, 2022, the National Green Tribunal (NGT), observed that untreated waste continues to be discharged in 60% of Ganga.
- Uttarakhand is the only state with sufficient treatment capacity.
- The tribunal had asked the states to file an updated report on sewage treatment.
- In December 2022, Uttar Pradesh submitted its report, in which it admitted that of the 1,340 drains that end up in the Ganga and its tributaries, 895 (66.8%) were operating without any treatment capacity.
- CPCB currently carries out manual monitoring for five parameters, including faecal coliform.
- In 2022, the river had permissible levels for two of the parameters: Dissolved oxygen & pH levels.
- Biochemical oxygen demand (BOD) at 17 stations remained higher than the permissible levels throughout 2022.
- BOD is a measure of the oxygen required by aerobic microorganisms to biochemically oxidise the organic matter. It affects the amount of dissolved oxygen in rivers.
- The higher the BOD, the lesser the oxygen available to aquatic life. In January 2023, at least 10 stations had high BOD levels.
- At a time when the Centre is focusing on cleaning up the Ganga, data collection and dissemination remain challenging.
- Sampling is being done every 15 days. Due to software limitations, only monthly data is made public," said A Sudhakar, division head, water quality monitoring, CPCB.
- The five parameters monitored at present are part of the notified Environment (Protection) Amendment Rules, 2000.
- The Centre released of two guidelines in 2007 & 2017 which recommended 25 parameters for perineal rivers

THE REVIVAL

10- POINT GUIDELINE

1. Promote only decentralised sewage treatment plants (dSTP) at the colony level. Reuse treated wastewater for irrigation & empty into natural drains.
2. The existing & planned STPs need to be verified on efficiency, reliability & technology parameters by independent agencies – Many STPs are not performing up to desired standards due to choice of

unrealistic assumptions & erroneous technology choice.

3. Develop & restore local storages (ponds, lakes, wetlands) as permanent solutions to both floods and droughts. Only 10% of water received during monsoon rainfall is harvested. Restoration of ponds, lakes and wetlands should be an integral part of river restoration and conservation strategy.
4. Bring back glory to all natural drains that empty into rivers, & transform & rejuvenate them into healthy water bodies — they have been converted to sewage carrying drains by our municipalities and planning bodies.
5. Start restoring lower order streams & smaller tributaries in the Ganga Basin. The focus of Ganga Action Plan (Phase I & II) & Namami Gange has been on the main stem of the river. The tributaries that feed the river were overlooked. The Ganga has eight major tributaries (Yamuna, Son, Ramganga, Gomti, Ghagra, Gandak, Kosi & Damodar). The majority of the funds were spent on pollution-abatement measures on the main stem of the Ganga and on the upper Yamuna basin, which constitute just 20% of the Ganga basin. Further, these eight major tributaries are joined by smaller rivers, whose restoration is equally important.
6. Identify, define & protect 'river-corridors' as areas for no cement-concrete structures. Infrastructure development & destruction of river ecosystem through populist measures such as riverfront developments in the name of area & township development projects or urban / smart city development must be stopped to protect & conserve surface water sources.
7. Map the entire looped length of each & every tributary of the Ganga & correct the land records. Many of the rivers have been underestimated which causes encroachment & jurisdiction conflicts. The existing methodology to measure river length is flawed & complete mapping of looped lengths is required for proper assessment of water resources & correct revenue maps. This will ensure that active flood plains & river-corridors are free from encroachments.
8. Restore base flows through groundwater recharge. Groundwater contributes significantly to river-flows through base flows (average base flow in the order of 40- 55 per cent) especially during lean seasons in the entire Ganga Basin. There is a need to have robust planning and regulation of withdrawal and recharge of groundwater
9. Define the desired ecological flow regime in the Ganga main stream & its tributaries to allow the rejuvenation of the river. According to the Central Water Commission, all the existing hydroelectric projects have provision for releasing the mandated environmental-flow – Old dams should be decommissioned once irrigation efficiencies are improved.
10. Evolve new and innovative ways to generate sufficient revenues for operation & maintenance (O&M) of water and wastewater infrastructure through pricing and valuing water. The municipalities are struggling to operate their existing STPs due to lack of financing. Municipalities & urban local bodies can tap into bond markets to finance the O&M.
