

### Action Plan for Abatement of Godavari River Pollution

#### 8.1 Preamble

The Study for rejuvenation of River Godavari and preparation of Integrated Action Plan for improvement of Environmental Status was undertaken as per the direction of the Hon'ble High court in May 2013. The main objective of the project was to improve the status of River Godavari. NEERI submitted a document "Action plan to tackle forthcoming KumbhMela in Nashik" in the month of November 2013. NMC has already initiated the action on suggestions/recommendations of NEERI. The committee has been formed as per the Hon'ble High court order dated 7th March 2014. The committee includes Commissioner NMC, Divisional Commissioner Nashik, Police Commissioner, representative of NEERI, Regional Officer MPCB, Chief Engineer Irrigation, Collector of Nashik, expert in the field appointed by Divisional Commissioner.

Major issues for rejuvenation of river Godavari were identified for critical evaluation and immediate attention for rectification so that the river water quality improves and meets the stipulated A-II class standards as given in **Box 1**.

#### Box 1: Issues of River Godavari

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| <p><b>I. Reduced capacity of Gangapur dam for water storage as more water is needed in non-monsoon months due to siltation</b></p> <p><b>II. Maintenance of Minimum flow in the river Godavari during non monsoon months</b></p> <p><b>III. Comprehensive Storm water Drainage system</b></p> <p><b>IV. Wastewater Management</b></p> <ul style="list-style-type: none"><li>a. Inadequate collection of domestic waste water, its treatment and disposal in river</li><li>b. Status of interceptor sewer lines and trunk mains within and across the river bed through left and right bank at specific locations like Chikhali nalla, Chopda lawns and other places</li><li>c. Delay in installation of new STPs, up-gradation and proper maintenance of all the sewage treatment plants</li><li>d. Control of discharges of untreated and treated effluents from domestic wastewater treatment plants with the consideration of assimilative capacity of river, non point sources like seepages due to land application into the river.</li><li>e. Discharge of industrial effluent, untreated or partially treated into the river directly or through land application.</li><li>f. Reuse and recycle of water and wastewater</li></ul> |
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**V. Solid waste management**

**VII. Impact due to Devotees**

- a. Use of Godavari river banks as common places for washing, cleaning, bathing etc.
- b. Discharge of human body ash at “Asthi Visarjan” and biodegradable organic material during “Dashakriya Vidhi” performed at the bank near “Ramkund”
- c. Mass bathing by devotees and disposal of “Nirmalya” in Godavari River

**VIII. Open defecation in slums at the banks of river**

**8.2 Action Plan with respect to Specific Objectives**

**I) De-siltation of Gangapur Dam**

Over the years, significant silt has accumulated in the Gangapur dam resulting in reduction of water storage capacity of the dam. The need of water is increasingly being felt by all the sectors. The requirement of water for religious, social and ecological functions needs to be carved out. The decrease in dam storage will be detrimental for all the stakeholders and sectors. Therefore, De-silting should be taken up on priority basis after proper assessment and techno-economic feasibility study.

**II) Flow in River Godavari**

Due to construction of dams in the upstream region and impacts due to climate change, resulting in irregular/inadequate rains, the flow in the downstream stretch of the river is not observed during non monsoon months except when dam releases water. The irrigation department releases water on demand from Eklahare Thermal Power Plant. The details of such releases are presented in **Annexure 20a**. The planning for utilization of water from Gangapur dam for various purposes has been done by irrigation department and the details are presented in **Annexure 20b**

- The releases from dams upstream of discharge locations of domestic and industrial waste waters will provide adequate dilution and dispersion of pollutants resulting in compliance of A II standards in almost whole stretch of river within the study area.
- The irrigation activity has been reduced and one of the irrigation canal from Gangapur dam is non operational. Monitoring of irrigation water demand can help release of water into the river
- Alternatively, the inputs of waste water should be stopped and treated waste water discharges can be diverted for other purposes such as industries and irrigation.
- Further, NMC should incorporate guidelines to all housing societies to install dual pipelines for recycle and reuse of treated wastewater for flushing and gardening.

### **III) Storm Water Drainage System**

- It appears that NMC does not have comprehensive storm water management plan. There is a need to create a master plan for storm water drainage. Also storm water drains carry sewage in many parts of the city as sewerage system is combined at many places. Hence regular maintenance and monitoring of the same should be carried out periodically.
- The storm water drainage system is a very essential infrastructure development. NMC should take up the comprehensive study. Though NMC has undertaken need based analysis of chronic hotspots however, flood prone areas need to be properly assessed, studied and remedial measures should be planned.
- Residential complexes with area greater than 150 m<sup>2</sup> should mandatorily carryout rain water harvesting for efficient usage of rainwater.

### **IV) Wastewater Management**

#### **a) Collection of Domestic Wastewater**

- 100% collection of wastewater should be achieved in order to avoid any wastewater directly entering the river by March 2015.
- Wherever collection process is not feasible in short time, in situ nalla treatment should be adopted.
- Prior to awarding permission for development of new residential areas in the outskirts of the city, there should be provision of sewerage network and STP of appropriate capacity and accordingly authorities should take prompt action for construction of new STP.

#### **b) Status of Sewers**

- Regular O& M of sewers and sewerage chambers should be done as leakages or breakages in either can lead to flow of huge quantity of sewage in to the river Godavari. In case of laying new sewer lines, these should be away from High flood line of the river. (*as given in Chapter 10*)
- Deliberate breakages of Sewage chambers have been observed for irrigation purposes. Such activities should be stopped by undertaking strict actions and providing alternatives by using treated water for irrigation through decentralized system.
- The centralized sewer system is always problematic due to multiple lines and expensive due to need for pumping which requires electricity. All conventional sewer and STPs require very high O&M costs, especially uninterrupted power and trained manpower. Hence Decentralized wastewater treatment is recommended at least for all multi complex projects.

**c) Maintenance and Up-gradation of STPs**

- Regular maintenance and up gradation of STPs should be carried out for effective treatment of wastewater. The status of STP performance unit wise should be submitted after audit to MPCB, NMC and other concerned authorities.
- Calibration of all the pumps should be carried out at pumping stations and STPs to generate more reliable data on quantification of sewage.

**d) Control of Wastewater Discharges from Nallas**

- To estimate the pollution load from non-point sources like nallas, the quantification of wastewater flowing through nallas must be done on the regular basis. In the light of minimum dilution capacity of the river, only properly treated waste water should join nalla streams.
- Highly polluted nallas, construction of check dams and a recent technology of “Phytorid” or “Floating wetland” from NEERI or NWT from IIT Bombay can be adopted to restrict entry of pollutants in the river.
- The check dams can be constructed in the nallas which will allow the water to percolate in the ground. This can help in groundwater recharge.
- NMC has undertaken work of nalla diversion in the month of March 2014. The nallas have been diverted to nearby Pumping stations. The efficacy of nalla diversion should be checked by assessing the increase in flow at Pumping stations. Alternatively, tracer technique should be adopted to confirm the flow path of intercepted and diverted nallas.
- All septic tank when to be installed should be as per efficient design developed by IIT Bombay. All wastewater from toilets should be invariably passed through NG- SEPCLEAN.

**e) Industrial Wastewater**

- Water audit should be carried out at regular intervals for all major polluting industries with more than 25m<sup>3</sup>/day flow of effluent.
- Satpur MIDC area does not have drainage system to carry their effluent to the proposed CETP. The effluents will be transferred to CETP through tankers. Hence, it is advisable that the drainage system should be laid in the Satpur MIDC area prior to construction of CETP.
- As per the NEERI’s suggestion and High Court directives, the land has been acquired for construction of 1 MLD CETP. If the effluent of CETP does not comply with the standards it can be further treated through SSHEHS (Sand Soil High Efficiency Hybrid System) developed by IIT Bombay.
- As continuous application of industrial effluents on land can have long term impact on the soil quality, the quality of soil where the industrial effluents are being applied needs be checked to ensure the natural balance.

**f) Reuse and Recycle of Wastewater**

- Reuse and recycle of treated wastewater for construction purposes should be implemented through formulation of new byelaws.
- Recycle and reuse of filter backwash water: As per the projection of water requirement, the expected water supply in 2041 is going to be above 700 MLD. Backwash water of about 3-5%

of this water supply will be generated from Water Treatment Plants. Currently this back wash wastewater is diverted to pumping station through nallas. A proper in situ treatment of this backwash water should be done by sludge settling and the remaining water should be reused.

#### **V) Solid Waste Management**

- The Nirmalya received at Solid waste dumping site can be segregated and processed separately for its medicinal use (Hibiscus flowers for medicinal oil preparation) and vermicomposting instead of disposing it along with domestic solid waste. Quantification of Nirmalya should also be done.
- The leachate generated out of the solid waste dumping site should be further treated as it has found that it does not meet the standard norms. The application of such leachate may lead to deterioration of the soil quality. Leachate should be taken to one of the STP for further treatment as its volume will be negligible to STP flows.
- Activities have been initiated for implementation of action plans suggested by NEERI for proposed Kumbhmela by NMC. The Hon'ble High Court had given the instruction to plan time bound programme for successful implementation of all the recommendations, provided by NEERI. Accordingly NMC has formulated various groups to execute the recommendations. The information of these activities and the minutes of the meeting conducted so far are presented in **Annexure 22**. A sub committed has been formed particularly to look into the methodology of deciding minimum flows in river Godavari for a stretch under consideration so that the ecology of the river is preserved.

#### **VI) Minimize Impacts Due to Devotees**

As Nashik city is a Holy place, enormous number of devotees visits the city .resulting in high floating population all through the year. Devotees perform various kinds of Pujas at certain places at the bank of the river. This leads to addition of organic matter mainly “Pindadan comprising of cooked rice during Dashakriya and nirmalya in the river. Control of ritual inputs by devotees is also essential to check the pollution at the banks of temples specifically at Ramkund. The following measures should be considered:

- Appointment of special squad for vigilance and control of misuse of river at the banks for washing of clothes, vehicles is recommended. A heavy fine should be levied and collected from those who do not follow the restrictions. Alternatively, such violators should be taken to NMC created “Awareness Room” where an audio visual show of one hour should be shown compulsorily before releasing such persons. Such “Awareness Rooms” can be created at multiple places and supported by NGOs and citizen groups. Schools can be good places for such activities.

- Artificial ponds should be constructed at the banks of Ramkund for “Dashkriyavidhi so that entry of putriciable organic matter into the main stream can be restricted. The water in the artificial pond should be replaced and separate treatment should be provided to this polluted water.
- **Disposal of Nirmalya**
  - Placing of nets on the bridges to avoid throwing of Nirmalya across the river flow and also downstream of holy places such as Ramkund, Tapovan to collect floating Nirmalya disposed by the devotees can be helpful to reduce the amount of Nirmalya in the river.
  - At present, many permanent ghats have been constructed on the bank of River Godavari. As the river Godavari is a non perennial river, the banks of the river must be protected. Hence temporary ghats may be built if more ghats are needed in the future.
  - Volunteers should be appointed for effective collection and disposal of such material.
  - Awareness programmes should be organized for adoptions of the improved system for pollution prevention.

## **VII) Open Defecation**

- Public toilets with septic tanks should be constructed in slum areas to avoid open defecation. The septic tanks should be continued to be made compulsory, new modified designs like IIT based technology NG-SEPCLEAN can be incorporated.

## **VIII) Other Corrective Measures**

- The input of pollutants and excess nutrients has led to growth of water Hyacinth in the river water. The major disadvantages of the Water Hyacinth include reduced light penetration, reduced oxygen transfer in the water and cause death of fishes. Hence measures to prevent water hyacinth growth in the river should be implemented. One of the major ways to prevent water hyacinth growth is to reduce the entry of excess nutrients through various sources like nallas.
- Water Hyacinth removal should be carried out regularly through mechanical methods by application of boats. The material removed should immediately be picked up from the bank of the river and properly disposed. NMC has initiated implementation of this suggestion. The stretch of a river with water hyacinth is given on contract for removal of floating matter and the party appointed is permitted to use the boats for recreation.

- Chemical methods like addition of herbicides may also be used, provided the toxicity tests are done prior to use to ensure protection of water quality. Recent research on control of Water Hyacinth utilizes non toxic agents like brine with Neem based herbal combination. The removed water Hyacinth can be used for production of Biogas, fertilizers and compost as it is rich in nutrients.
- Other suitable technologies can also be used for removal of water hyacinth. (Use of brine solution with Neem extract) presented in **Annexure 21**.
- Fly ash from Eklahare power plant should be used for various purposes such as production of bricks

In order to monitor the progress of implementation activities undertaken by the Nashik Municipal Corporation, team from NEERI will make regular visits to the city once in every two months. A short progress report would be made from time to time and submitted to the court.