

Action Plan for Abatement of Godavari River

NEERI was awarded “**The Study of Rejuvenation of Godavari River, Maharashtra**” by the Hon'ble High court in December 2013. The main objective of the project was to improve the environmental status of River Godavari.

Following major issues for rejuvenation of river Godavari were identified for critical evaluation and immediate attention for rectification so that the river water quality will improve and meet the stipulated A-II class standards.

- Maintenance of Minimum flow in the river Godavari
- Inadequate collection of domestic waste water Treatment and its disposal in river
- Delay in Installation of new STP, up gradation and proper maintenance of all the existing sewage treatment plants.
- Control of Discharge of untreated and treated effluents from domestic and industrial waste water treatment plants and non point sources like leachates from domestic solid waste dump sites or through land application into the river without due consideration of assimilative capacity of the river.
- Restriction on Use of Godavari river banks as common places for washing, cleaning, bathing, Open defecation in slums etc.

The action plan with respect to specific topics is elaborated below.

Flow in River Panchaganga

- The releases from dams upstream including Radhanagari, Dudhganga are responsible for the flow in the river Panchaganga. Additional release of water from Gaibi tunnels practiced in November 2013, in non monsoon months till 31st January 2014 has provided adequate dilution and dispersion of pollutants resulting in compliance of A II standards in almost whole stretch of study area.
- Regular release of water through existing dams is essential to maintain ecological flow. Allotment of water from dams in the catchment area should be rescheduled to have flowing water throughout the complete stretch. The frequency and quantity of water release should be computed using environmental flow concept. This would not only ensure dilution but also create an ecosystem where ground water recharge in near zone, survival of aquatic and terrestrial flora fauna and human aesthetics would take place.
- The current practice of water releases from KT weir is through the opening of gates at the surface. The design of gates provided to the K.T. Weirs should be modified to release the water from the bottom so that the sedimentation at the bottom can be minimized.

- Back water of Krishna river near the confluence has created a pool of stagnant water. This phenomenon is crucial with regards to the maintaining flow in the river. The reasons behind back water phenomenon other than geological reasons should be investigated. The phenomenon of ingress of Krishna river water into Panchaganga river water through Shirol and Terwad K.T. Weirs is observed up to March every year. Occurrence of such events needs detailed investigation by Irrigation department to estimate the impact of stagnation on the deterioration of water in this specified zone of K.T. weirs
- River cleaning operations through boats for removal of water weed, water hyacinth, Nirmalya, plastic bags, floating matter, etc. should be strengthened.
- As regards the pollutional status of river Panchaganga, pumping of Water from Panchaganga River for Ichalkaranji water supply needs critical evaluation. Also Ichalkaranji intake of Krishna river water should be shifted upstream of Narsimhawadi.

Wastewater Treatment systems Management

In Kolhapur city, only 30% area is skewed. Sewage from other areas meet river through nallas. In Ichalkaranji, an existing sewerage system is in old town. There is no sewerage system in the extended area of Ichalkaranji including Shahapur and Kabnoor area. Due to inadequate sewerage system the STP at Ichalkaranji is under loaded. Thus the sewage discharges from nallas significantly contribute the pollution resulting in deterioration of the river quality. Traditionally, a complete underground sewer system is preferred. However, failure of such a system has been noticed in many places. In addition, the integrated sewer system leads to accumulation of high quantity of effluent at one place. Failure to treat this large flow at or near the river bank almost makes sure that river water will get polluted.

- As the current provision of waste water treatment facility of only primary treatment at Kolhapur is not adequate, immediate attention is required for proper functioning of all STPs. A new STP of 76 mld having SBR technology at Kasba Bawda is not yet started. A new STP at Dudhali is in the proposed stage only. The time bound programme of completion of all concerned projects to prevent pollution and methods for recycle and reuse of treated effluents from waste water treatment plants is essential.
- Effective collection of wastewater and its transfer to STPs should be taken up on priority basis with 100% achievement of collection and treatment. The domestic wastewater should be properly collected and treated in the STP to comply consent values for BOD.
- If the remedial measures suggested are not implemented by the corporation immediately, more stringent standards for discharge of treated effluent may be imposed by MPCB.
- Recycle and reuse of treated effluents from STPs for irrigation and transfer the equivalent flow into the river is recommended. The treated effluent from the STPs should be reused either by industries or for irrigation. By improving the quality of effluent, the water can also be used for

gardening and other related activities. This will also restrict the inputs of pollutants in the river stream.

- Environmental Management System (EMS) as suggested by NEERI should be adopted by KMC and INP for sustainable management of river quality Protection of river Panchaganga
- Prior to awarding permission for development of new residential areas in the outskirts of city, there should be provision of STP of appropriate capacity and accordingly authorities should direct to take prompt action for construction of new STP.
- The centralized sewer system is always problematic due to multiple lines and expensive due to need for pumping which required electricity. All conventional sewer and STPs require very high inputs in terms of O&M costs, especially uninterrupted power and trained manpower.
- It is, therefore, recommended that natural systems such as “PHYTORID” are used for sewage treatment in a decentralized fashion. In addition, decentralized sewer lines are planned for a smaller area with “shallow sewer type” design so that pumping is avoided and waste water can be treated effectively. Thus treated waste water can be easily used back either in the community or for agriculture. Excess treated wastewater then can be drained out in nallas which will not pose any threat to the river.

Nallas in Kolhapur and Ichalkaranji

- Large number of nallas exists in Kolhapur and Ichalkaranji city. A limited city area is sewered and sewage from unsewered areas meet river through these nallas which result into the deterioration of river. Many problems are faced like water hyacinth, algal blooms and non compliance of the river quality standards. The sewerage system should be expanded and the nalla flows should be stopped.
- The quantification of wastewater flowing through nallas must be done on the regular basis to estimate the pollution load. In the light of minimum dilution capacity of the river, only properly treated waste water should join nalla streams.
- To prevent the pollution contribution through nallas, all nallas should be redesigned to incorporate buffer polishing system so that no floating matter and silt system should enter into the river. Insitu treatment of nallas using recent green based technology like Phytoid, DEWAT, SBT etc. should be applied.
- The efficiency of current practices of disinfection of nallas must be evaluated to find out the reduction of pollutants.

Weeds and Sanitation Issues

- Occurrence of water hyacinth is very common and in many places. In some of the year, the nutrients and temperature regime become highly suitable for water hyacinth growth. Though the process of improving the source intensity would continue as given above, immediate removal of

water hyacinth using herbal-brine treatment can be undertaken. This method minimizes the volume of hyacinth very quickly and becomes easy to move it out.

- Urban poor and village sanitation must be addressed through provision of toilets with biodigester system (as developed by IIT Bombay).
- The PSRT system can be also effectively used in villages which are on the banks of the river. One need to address sanitation of the villages in these regions as in coming years, their population could be significant enough to impact the river water quality. The system detail is given Annexure X.
- Zilla Parishad shall submit time bound programme for procuring funds and completion of the work in the notified villages in the Panchaganga river basin with respect to sewer and MSW.

Industrial liquid waste Management

- All the CETPs should function properly for 24 hrs. The individual industrial wastewater treatment facilities should be subjected to higher level of treatment to meet the standards. More stringent standards should be applied for the effluents from CETPs if the current standards are not achieving the expected river water quality after receiving the effluents through nallas or through percolation.
- Currently, as per the consent of MPCB, Sugar industries must comply the zero discharge standards and the effluents from the sugar industries should be applied over agricultural land in sugarcane fields. The application of treated wastewater from sugar industries for growing sugar is acceptable. However, indiscriminate application causes not only soil pollution but also ground and surface water pollution. Since sugar industries are seasonal, their waste water storages of 15 days (as required under CREP guidelines) should be added with biological filter system so that BOD loads can be reduced substantially. A scientific study should be carried out to assess the water requirement of sugarcane at different life stages of the plant. This should be done as the excess water from the fields, if applied may leach out as underground flow to the river.
- Specific directions to sugar industries to reduce water consumption and thereby reduction in effluent generation. Authority shall verify every year water consumption with respect to crushing capacity in case of all sugar units. Accordingly MPCB will direct all concern authorities to ensure the same and instruct to continue the practice adopted to use of treated water for irrigation purpose to farmers with dilution. No further permission for crushing should be given unless the directions are strictly followed by the industry owners.
- CETP at Shirol and Gokulshirgaon MIDC needs to be provided by MIDC.
- The units generating industrial effluent existing in the municipal area and are not connected to the CETPs needs to be shifted to suitable industrial area where treatment and disposal facility is collectively available or the waste generated should be brought to CETPs.

- The effluents generated from other major industries like Jewellery, tannery etc. needs proper management. The locations of such industries should be in a cluster and separate CETP should be provided.
- The effluents from CETPs at Kagal and Lakshmi are used for land application and HRTS is applied with sugarcane, Nilgiri and Bamboo plantation. As the effluents from CETPs have high TDS levels, application of CETP effluents on land may lead to increase in salinity of the soil. Regular monitoring of the soils should be done in the areas where effluents from CETPs are applied on land.
- The HRTS system implemented are not meeting the norms due to improper design without the consideration of local soil and permeability consideration. In addition, CETP outlets do not meet the standards many times and therefore such wastewater application in a HRTS system would cripple the system.
- The rate of application of effluent permitted is 20 m³/ha. As the plants grow at various speeds, there is a chance of excess flow from HRTS which will ultimately join river through nallas. This aspect should be studied critically.
- CETPs shall have sufficient land available for disposal of fully treated effluent.
- KMC should establish an “Environmental Laboratory” to monitor the environmental components. INP should use KMC lab to analyze and control the pollution
- Permission for expansion of the existing units or establishment of new industrial units may be restricted until CETPs of sufficient capacity and the treatment thereof and disposal facility is in existence.
- Industrial units in Ichalkaranji local body shall have separate collection system for effluent and also needs upgradation of existing CETP with sufficient land available for disposal/irrigation.
- Strict Vigilance by MPCB officials with more frequent checks is essential to minimize the pollution and restore the ecology of river.

Future Studies

- Further studies are recommended on the following issues:
- Krishna river backwater
- Ecological/Environmental flow in the river panchaganga
- Seasonal variation on nalla flows before preparation of final DPR.
- Detailed study for pollution potential from the Villages located in Panchanganga river basin enlisted with population more than 5000