



REJUVENATION OF VILLAGE PONDS IN RETROFIT MODE USING NATURAL TREATMENT TECHNOLOGY



An initiative of the Ministry of Water Resources, RD & GR, Govt. of India



This is an eco-sustainable technology product for ensuring water security in India at village level, contributing to various GoI flagship schemes, such as PMKSY, SPM Rurban Mission, NMCG, SAGY, Swachh Bharat Mission.

Villages in India are facing stagnation of drains and choked ponds, which are in dire need of renovation so that the ponds are effectively utilized as a source of water security and groundwater recharge in the area. Once considered the lifeline of village economy, the ponds in present times give a pathetic look. In the present practice, village ponds are generally filled with all sorts of waste from their catchment areas. Domestic wastewater and solid wastes are dumped into these ponds. Disposal of wastewater in the ponds is a major public health concern as the stagnant water smells bad and also leads to spread of many diseases. As a result, ponds have become dump yard and are no more used for drinking or bathing purposes or any other useful purpose. The groundwater recharge from these ponds is also contaminating the local aquifers.

It is widely recognized that the encroachment, deterioration of ponds/tanks/water bodies leads to acute shortage of water and rapid depletion of ground water and thereby affecting local availability of water for irrigation, drinking and consumption by livestock, besides affecting aquatic flora and fauna and accordingly there is an urgent need for protection, conservation, development, redevelopment and rejuvenation of water bodies. The recycling and reuse of wastewater has a vast potential of addressing the water requirements of an area, which would ultimately lessen the burden on the freshwater resources. With the availability of millions of village ponds and local drains, there exists a vast potential of recycling and reuse of wastewater through simple retrofitting techniques. Such decentralized treatment of these small water bodies is an emerging need for their restoration and preservation, leading to multiple benefits of disaster resiliency, groundwater recharging, environment regeneration and livelihood generation at the local watershed level.

According to National Wetland Inventory and Assessment report (2011), India has 5,55,557 small water bodies (including village ponds) with area <2.25ha. As such, rejuvenation of these water bodies has large potential of achieving water security and climate resilience.



Before Rejuvenation

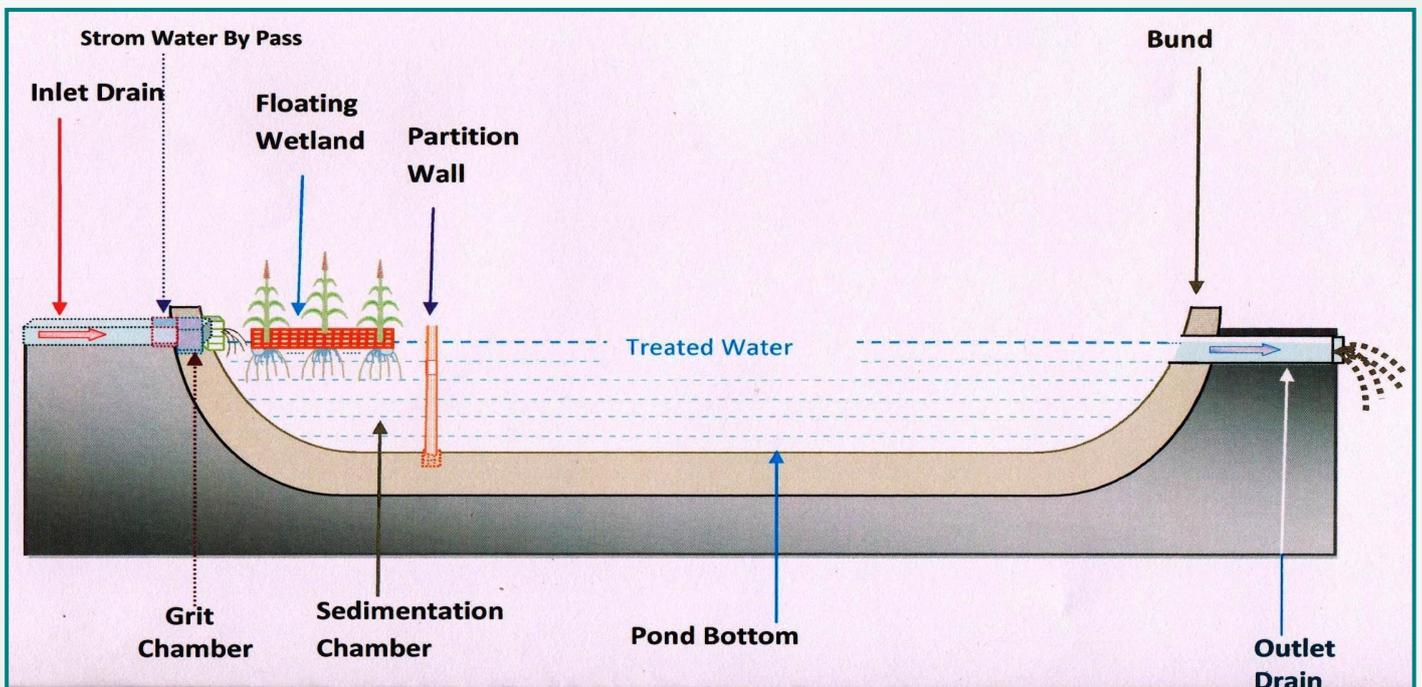
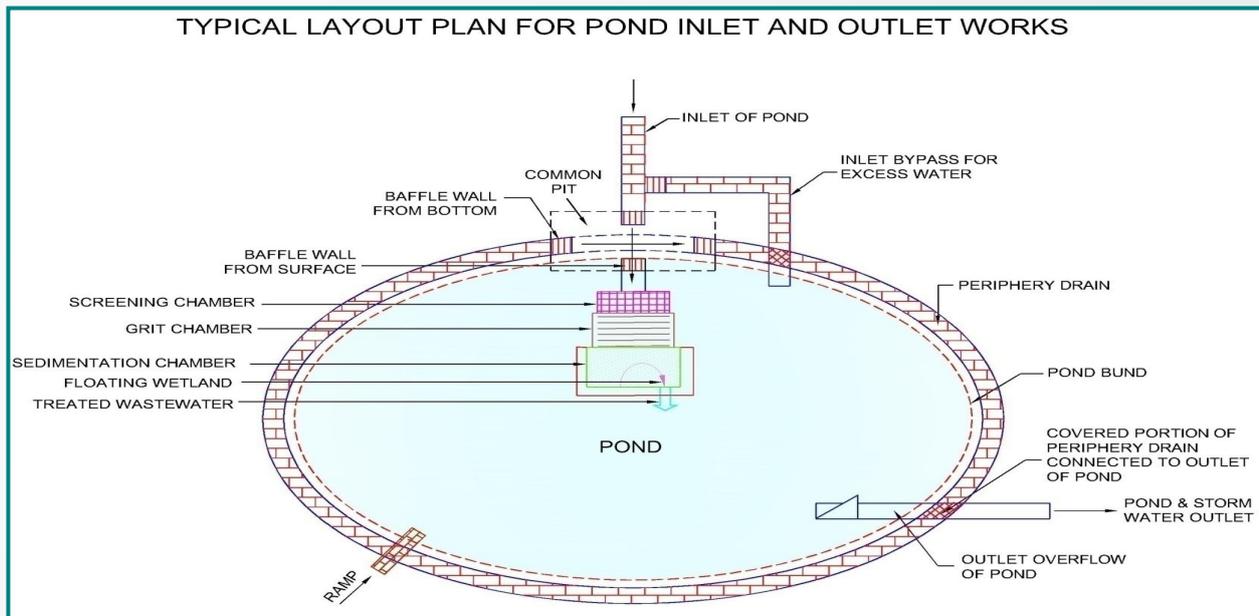


After Rejuvenation

Benefits

- Renovated ponds with enhanced storage capacity and depth will help in achieving water security for the local villagers,
- Renovated ponds with improved aesthetics will attract visitors for morning/evening walk,
- Groundwater level will improve through recharge,
- Quality of pond water will improve, which will improve quality of drinking water available from nearby hand pumps, leading to less chances of water-borne diseases,
- Treated wastewater from the ponds, if used for crop irrigation, will improve soil health and crop health.

Components of Rejuvenation:



Natural Treatment Technologies

Natural Treatment Systems (NTS) are time-tested, eco-friendly and cost-effective technology for handling the complete supply chain of sustainable wastewater management in Indian context. Localized NTS solutions can provide a viable option either in combination with the traditional STPs or in a standalone mode if sound business models and management systems responsive to the community needs and capacity are developed. Extensive use of NTS has been made in the US, UK, Australia and many European countries. NTS typically improve TSS, BOD, COD, MPN and TP.



Dewatering, Cleaning and Desilting of the pond



Inlet Design for Channelization of Wastewater and establishment of NTS technology



Pond Water and Groundwater Quality Characterization



Capacity Building of Stakeholders:

The local Gram Panchayat (GP) will own the responsibility of maintaining the rejuvenated village ponds. Standard Operating Procedure (SOP) for maintenance of the rejuvenated pond will be handed over to



Innovative R&D:

- ◆ Development of a cost-effective "Technology Package" for retrofitting of the existing village ponds
- ◆ Natural Treatment System (NTS) technology for treatment of the wastewater entering into ponds
- ◆ Estimation of water balance of pond, including groundwater recharge
- ◆ Impact assessment of the intervention
 - ◇ Change in groundwater level
 - ◇ Water quality assessment: Trophic State Analysis; Water Quality Index; Primary Production Capacity
- ◆ Assessment of GHG emission from pond
- ◆ Linking with livelihood activities: reuse of treated wastewater in agricultural fields; aquaculture

Water quality monitoring is carried out for surface as well as ground water sources (e.g. river/nallas, ponds, drains, handpumps)

Parameter	Before Rejuvenation	After Rejuvenation
EC (mS/cm)	1619	1108
Turbidity (NTU)	48	43.1
Alkalinity (mg/l)	578	276
Total Hardness (mg/l)	452	323
Na (mg/l)	112	89.4
K (mg/l)	73	42.7
Ca (mg/l)	98	83.9
Mg (mg/l)	50	27.7
Cl (mg/l)	162	123.5
NO3 (mg/l)	10.2	0.98
DO (mg/l)	0.2	5.5

Developed by:

National Institute of Hydrology (NIH) is a premier Research and Development organization under the MoWR, RD & GR, (Government of India). The main objective of NIH is to undertake, aid, promote and coordinate systematic and scientific work on all aspects of hydrology and water resources.

For more information, please contact:

Dr. V. C. Goyal

Scientist G & Head

Research Management and Outreach Division,
National Institute of Hydrology, Roorkee- 247 667

Phone: +91-1332-249226, +91-9412999725

Email: vcg.nihr@gov.in; www.nihrroorkee.gov.in

