Success Story
of
Water and Wastewater Management
for
Clean and Healthy Village Transformation: IBM Sustainability Initiative through CSR

Principal Coordinator- Prof. Ligy Philip

Co- Coordinator- Prof. B.S. Murty

(in association with Center for Urbanization, Buildings and Environment (CUBE) and Gramaantara Trust)

Genesis of the Project

The vision of AquaMAP is to identify and build win-win solutions for complex and challenging water problems of our nation by developing and evolving smart and wise water management practices and implementing them in the field, by leveraging innovative technologies/solutions, while balancing conflicting objectives of stakeholders and working with the society and government to formulate just policies.

The core team of AquaMAP has been instrumental in successfully creating sustainable village communities in the past in the state of Tamil Nadu through an integrated approach for solid waste management, rejuvenation of water bodies, water supply, wastewater management, storm drainage, and related activities. They have worked closely with Panchayat officials, local administration, residents, industry partners who provide financial support, and other stakeholders to achieve the goal of turning villages into clean and healthy villages. They had been looking for replicating these interventions in other geographical settings and learn from such interventions

During the early part of year 2022, Dr. Sapna Poti and her team from the Office of the Principal Scientific Advisor (PSA) to the Government of India initiated and facilitated the discussions between IBM and AquaMAP for the pilot implementation of the "Water and Wastewater Management for Clean and Healthy Village Transformation" in the state of Karnataka. After several rounds of discussions, field visits and revision of proposals, IBM and AquaMAP entered into an MOU on 19th September 2022, to undertake an IBM CSR initiative to create a role model for transformation to clean and healthy villages. AquaMAP partnered with Centre for Urbanization Buildings and Environment (CUBE) for the infrastructure implementation of the project. The selection of villages was carried out based on a preliminary site visit by the AquaMAP team (Fig 1), and in consultation with the NGO Gramaantara, who have been operating in the area for more than a decade. Gramaantara proposed Mallur gram panchayat for interventions consisting of four villages - Mallur, Muthur, Kachahalli, and Ankathatti—in Sidlaghatta Taluk, Chikkaballapura District, Karnataka. Based on the need on ground and the requirements of the project, Muthur village was chosen for implementation for the 1st phase of the project. The project was launched on 1st October 2022 along with a reconnaissance survey (Fig 2). This was followed up with a social survey and awareness programme.

Fig.1: Preliminary site visit

Fig.2: Photos taken during the Reconnaissance survey.

The Goal

The goal of the project was to create a clean and healthy village through effective water and wastewater management, coupled with corporate-academic socially responsible actions, with active participation of all stakeholders – Government/ Panchayat, IBM Employees, NGOs, and Village Community.

Deciding on the Scope

Within the constraints of the financial support provided by the IBM, works to be carried out to achieve the goals had to be prioritized. For this specific project, the target was to protect the massive fresh water lake located in Muthur Village from getting contaminated by the untreated domestic wastewater coming from the village. There was a nominal stormwater drainage network in the village, which consisted of disjointed street-side drains. Villagers were discharging the grey water from their houses into these storm water drains, which subsequently was being carried all the way to the lake on the outskirts of the village, thus completely polluting it. There were four wastewater outlets into the lake. Also, villagers were throwing their solid waste into these drains. Thus, in order to protect the lake from contamination, the following actions were chosen to be taken up:

1. Reroute the drainage network: This included construction of new drains and repair of existing drains where required. Essentially, the drainage system needed to be enhanced for its capacity and also made continuous so that all the wastewater from the households is carried to the downstream treatment system. This also involved closing of all the wastewater outlet points except one, where treatment plant would be located.

2. Intercept the wastewater coming through the drainage network and treat it before it is discharged into the lake. Given the rural setting, the wastewater treatment system should be a nature-based system which: (i) does not have any mechanical components; (ii) does not require any electric power for operation, and (iii) does not require any addition of chemicals. Further, the treated wastewater should meet all the stipulated discharge standards so that it can be discharged into the lake for storage and subsequent use.

   Accordingly, the AquaMAP team designed a system for the treatment of the intercepted wastewater, comprising the following components: (i) an advanced modified septic tank system with three chambers and baffle walls, instead of the usual two chambers of a conventional septic tank and (ii) a constructed wetland system. This treatment system would treat the intercepted waste water very efficiently and the treated wastewater would meet the discharge standards, including the removal of nutrients, which cause eutrophication of lake.

3. This lake was desilted almost a decade ago, and there was substantial silt deposit since then, which has reduced the capacity of the lake. Although the funds were not provided by the IBM Corporation for desilting of the lake, AquaMAP targeted to approach other organizations for facilitating this work too.

4. Strengthen the lake bund around the point where treated wastewater is discharged and also beautify the lake front around this area.

Building of the Team

Right from the start, it was planned to implement this project as a team project and AquaMAP diligently worked to build the team for achieving the success. Once the scope was finalised, the roles of the various stakeholders were spelt out:

1. Profs. Ligy Philip and B. S. Murty provided the plans and designs of the wastewater treatment and drainage systems. Along with the supporting staff at AquaMAP, they coordinated the entire project.

   Members of the Governing Board of the AquaMAP provided the information to the coordinators about the possibility of getting an earth moving equipment as a "grant" from the "Deshpande Foundation". This was successfully pursued by the Team.

2. **CUBE:** Center for Urbanization, Buildings and Environment was roped in for conducting surveys and for the implementation. CUBE is a society formed by the IIT Madras, along with the Government of Tamil Nadu, and is head quartered in the IIT Madras research park. CUBE works closely with faculty members of IIT Madras on various projects related to buildings, infrastructure and environment. The scope of CUBE involved:
   a. Baseline and Technical Surveys
   b. Detailed engineering based on the designs provided by the AquaMAP
   c. Procurement
   d. Work Execution

3. **On the basis of suggestion by the Office of the PSA, Gramaantara, a Non-Governmental Organization was brought into the team.** Following responsibilities were assigned to the Gramaantara Trust:
   a. Close coordination with community, Panchayat and larger administration
   b. Alerting AquaMAP in case any troubles arises
   c. Coordinating with other organizations who may help in the rejuvenation of the lake
   d. Managing IEC activity to create awareness
   e. All manner of local help for visiting project partners from outside state with the village community and various levels of the local administration from Gram panchayat to the Zilla panchayat

   Gramaantara pursued with Deshpande Foundation over a period of 2 months to get the excavator for the desilting of the lake. It was finally brought from Hubli to Muthur in the month of January 2023, after overcoming several transportation challenges. This is now in the charge of the Muthur Panchayat members, under monitoring by Gramaantara.

4. The local government officials were kept in the loop and the progress of the project was informed to them on a regular basis so that there is a sense of ownership of the assets being created. This is very much needed so that the provided infrastructure will be best utilized in a sustainable way after handing over of the project to them. In a similar way, the IBM officials were involved in social survey and awareness programs, and were encouraged to visit the site several times so that they can "feel" the transformation that is occurring.

Timeline of the Implementation

1. The project was launched on 1st October 2022 (Fig 3)

Fig .3: Launching of the Project

2. Social Survey was conducted on 21st October 2022 with the participation of 30 IBM staff volunteers from Bangalore team (Fig 4) to assess the social capital in the village.

Fig. 4: Social Survey

3. Topographical and Hydrographical surveys were conducted in the months of October and November 2022 (Fig 5 and Fig. 6)

Fig.5: Topographical and Flow measurement surveys

Fig.6: Drone and total station survey

4. A programme was conducted on 18th November 2022 (Fig 7) for creating awareness among the villagers about the importance of waste management, nexus between cleanliness-hygiene-public health and how they can help in making the project a success.

Fig.7: Awareness Program

5. Works on (i) nature-based wastewater treatment system consisting of modified septic tank and constructed wetland; (ii) retrofitting of the lake bund in the vicinity

of treatment facility; (iii) retrofitting of drainage system and (iv) development of lakefront were all completed by 30th June 2023 (Figs. 8 through 13)

Fig.8: Construction of Septic tank

Fig.9: Inspection Chambers

Fig.10: Construction of Constructed Wetland

Fig.11: Construction of drains

Fig. 12: Lake bund repairs

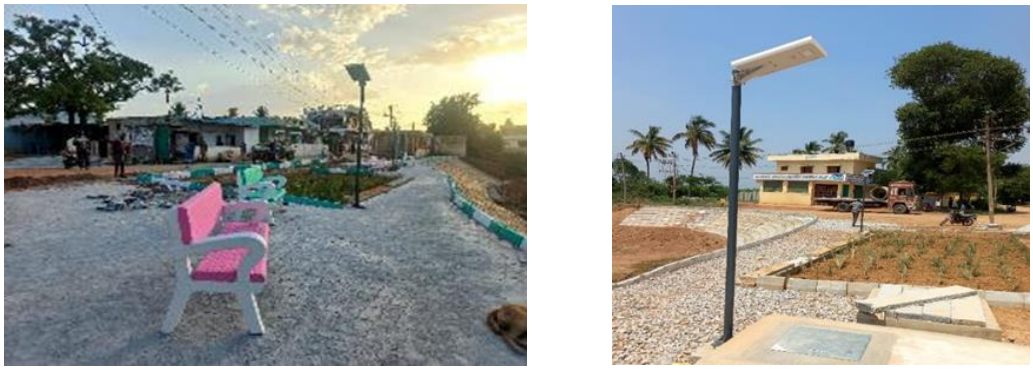

Fig.13 : Lake front developments

6. Wastewater Management facility (including the guidelines for maintenance of facilities) was handed over to the people of Muthur Village in a function presided by the MLA of the region on 23rd August 2023 (Fig 14).

Fig. 14: Handing Over and felicitations on August 23rd 2023

Post Script

This project could be successfully implemented because it was conceived as a "Team Project" right from the start and every constituent of the team felt the ownership of the project and contributed at the right time in right way. Dr. Sapna Poti and her colleagues from the PSA's office brought the AquaMAP, IBM and Gramaantara onto a single platform. They facilitated the "conversations" and "trust building", which resulted in signing of an MOU, focusing on multi-stakeholder involvement for creating clean villages. IBM provided the necessary financial help and also participated in several activities. AquaMAP provided the technical solution and coordinated the project. CUBE efficiently executed the project in close coordination with AquaMAP. Gramaantara worked on the ground with all the key stakeholders thus ensuring smooth implementation. AquaMAP ensured the cooperation of local Government officials by helping them whenever it was approached for technical help in other related projects. They vetted some of the DPRs in the area of water management and sanitation prepared by Mallur Gram Panchayat for funding under Jal Jeevan Mission. AquaMAP facilitated the donation of an Earth Moving Equipment to the Panchayat by the Deshpande Foundation for lake desilting. Gramaantara came forward to take care of this equipment on behalf of Panchayat.

To summarize, this project means clean water for the villagers - homes, their cattle & goats and for their farming. The project will fetch improved public health outcomes, besides enhancing their social and environmental settings. They will now have a model grey water treatment system and a model clean lake that they can take pride in.

Fig .14: View of Muthur lake “now” and success moments