

# Waterbody Rejuvenation

Towards Clean and Thriving Ecosystems

Until a few decades ago, when population sizes were manageable and cities were not bursting at their seams, **letting out sewage into our waterbodies** did not pose as much of a risk as the load was **enough for nature to naturally cleanse**, treating the sewage yet keeping waterbodies (rivers, lakes etc.) clean. With **urbanisation** and **industrialisation**, however, as this load has increased, natural processes have gotten disturbed; such that **nature's self-healing capacities can no longer counter the multiple onslaughts** (solid waste, industrial pollution, dumping of sewage, commercial fish farming etc.) thrown at it.

Treating sewage before it enters a waterbody has thus become, a necessity – if we want **a clean and healthy environment.** 

The growing scale and urgency of the problem combined with **our expertise in wastewater and faecal sludge management** prompted us to enter the waterbody rejuvenation space in 2016. This has enabled us to **impact water and sanitation at a much larger scale.** 

## Our Approach

We recognize that successful Waterbody Rejuvenation is a multi-stakeholder effort. Hence, we work in collaboration with State and Central Governments, City Administrations, Corporate Social Responsibility wings, Philanthropy Foundations and Multinational Donors for the same; as well as with a network of organizations which have expertise in **urban placemaking** and **biodiversity conservation**.

Key Elements of Our Approach

- A holistic approach that looks at multiple facets of a waterbody – technical, environmental, social, regulatory and institutional
- Nature-based, simple systems that are cost-effective and can be managed by the community
- **Conservation** and preservation of a waterbody's **ecosystem services**
- A highly contextualised solution
- Engaging with stakeholders, **bringing the Government**, **corporates and citizens together** in the rejuvenation process

Our approach aligns with achieving the Sustainable Development Goals (SDGs)



# Key Projects

## Eco-Restoration of 9 Lakes Coimbatore, Tamil Nadu

#### Context

Under the flagship Smart Cities Program, Coimbatore Smart City Limited initiated the Eco-restoration of 8 interconnected lakes spanning 900 acres. The larger aim was to create vibrant recreational facilities around the lake without disturbing its ecology.

This Project was extended to include the rejuvenation of a 9<sup>th</sup> lake – the Kuruchi Lake – with the same goal.

#### Highlights

CDD Society developed master plans for the following categories of interventions:

- Developed designs and drawings for wastewater treatment and water infrastructure
- · Conducted environmental impact assessment
- Developed the financial and institutional framework for implementation and O&M



Before-after pictures of a redeveloped stretch along the Periyakulam Lake





quantity of wastewater flowing in the drains





## Rejuvenation of Mahadevapura Lake, Bengaluru, Karnataka

#### Context

Rejuvenation of the Mahadevapura Lake is a joint collaboration between the Bruhat Bengaluru Mahanagara Palike, United Way Bengaluru (channeling CSR donations from Amazon, Cyber, Dell and Mphasis) and CDD Society as an implementation partner, to treat sewage from the abutting drain using nature-based systems, to restore the lake's pristine ecosystem.

#### Highlights

CDD Society developed designs for the treatment system, intake and diversion structures; and was also involved in construction supervision and ongoing O&M of the system.

- Design and implementation of an innovative and simple intake and diversion structure to tap wastewater for treatment
- Design, implementation and ongoing O&M of a 1 MLD (million-litres-per-day) decentralized wastewater treatment system (DEWATS<sup>™</sup>)
- Implementation of a combination of gabions and floating treatment wetlands for tertiary treatment











## Pilot Rejuvenation of Alappuzha Canal Network, Kerala

#### Context

This multi-stakeholder effort aimed at rejuvenating the Vada and Commercial Canal that are part of the larger canal network in Alappuzha town. Communities represented by their leaders, bureaucrats, academicians from IIT Mumbai along with wastewater treatment and landscape consultants (i.e. CDD Society and Inspiration respectively) led this transformational effort.

#### Highlights

As part of this effort, CDD Society undertook a pilot - covering 200 households along a 800m pilot stretch - of the Municipal Colony canal. This pilot will enable selection of the best solution to be scaled across the entire canal network.

- · Design and implementation of screens for cleaning of solid waste
- · Design and implementation of shallow sewer network and DEWATS<sup>™</sup> to handle waste at source
- Proposed floating treatment wetlands at the convergence of the sub-canals with the main canal
- · Capacity building of Alappuzha council members and residents regarding the value of the system





Before-After construction of the pilot stretch



# Preparation of Proposal for the Rejuvenation of 5 lakes in Bengaluru, Karnataka



#### Context

Under this project, CDD Society is supporting Karnataka Forest Department (KFD) and BBMP's efforts in rejuvenating Bengaluru's lakes by creating proposals for 5 of the city's lakes (Kengeri, Hebbal, Nagavara, Vengayanna Kere and the twin lakes of Mylsandra and Sunkalpalya). The clarity and direction in the proposals will help KFD attract funding support from Government as well as corporates.

#### Highlights

Each proposal contain a clear action plan for the rejuvenation of each lake.

- Each lake Rejuvenation Masterplan includes:
  - An understanding of the present condition of the lake - Identifies the issues that plague the lake

  - Prioritizes key issues and develops a schematic solution
  - Recommends implementable solutions

## Dwarka Drain Remediation, New Delhi

The Delhi Development Authority (DDA) wished to transform Dwarka's drains from their existing state as open sewers into greenway corridors that serve as welcoming public spaces with bicycle and pedestrian access. Working with the DDA and the Centre for Green Mobility Ahmedabad, we devised a 'Vision and Strategy' document' that articulates the specific objectives for this vision to come alive.

It included plans for in line treatment of sewage; recommending additional wastewater treatment facilities, where inline treatment was not possible. The plans factored in seasonal flow variation in the drains thereby integrating elements of stormwater and wastewater management.

## Wetlands at Nagawara Lake, Bengaluru, Karnataka

Spread across 75 acres, Bengaluru's Nagawara Lake required restoration of its wetlands, which had been developed by the (now defunct) Karnataka Lake Conservation and Development Authority (KLCDA). Wetland restoration was aimed at improving the treatment efficiency of the wetlands, maintaining the water storage capacity in the lake, and enhacing the aesthetics of the surrounding areas.





## Sadarmangala Lake, Bengaluru, Karnataka

This is a collaborative effort between United Way of Bangalore, General Electric and CDD Society.

Sadarmangala Lake, located in Whitefield, is another of Bengaluru's lakes which is a victim of urbanisation. In 2019, the BBMP undertook an effort to deweed and desilt the lake in order to improve its carrying capacity. Supplementing those efforts, we have setup a wastewater treatment system (750 KLD) to treat part of the inflow before release into the lake. This will go a long way in keeping the lake full, especially during the dry season. We also intend to work in a more wholistic manner in the future – restoring the natural ecosystem and accompanying biodiversity of the lake – so the lake may serve as a green, open space amidst the concrete jungle it is located in.

## Saidpur Nallah, Patna, Bihar

Saidpur *Nallah* (Drain) is an open storm water drain in Patna city, Bihar, which over time has become a carrier of wastewater and solid waste instead. City authorities are thus planning to cover it with an elevated road, in order to put out of sight.

The University of Pennsylvania's School of Design and the Anant National University in Ahmedabad have thus come together to work on an alternative. With CDD Society and Biohabitats as technical partners, solutions are being explored (on an 8.6 km stretch of the entire 13 kms) to address the pollution in the nallah so that it may continue to be kept open and fulfil its role in storm water management.





# Services

The range of services we offer are:

## Preliminary Planning Phase

### Preparation of High-level Rejuvenation plans

A broad level situation assessment and schematic rejuvenation plans with block cost estimates to aid in decision making, in convening consultation meetings with stakeholders and and in raising funds for the rejuvenation

## Detailed Planning and Design Phase

### Data Collection and Analysis Phase

- Catchment area mapping through GIS
- Topography and bathymetry survey
- Quality and quantity analysis of wastewater
- Soil testing

### Master Plan Development

- Development of wastewater treatment strategies
- Catchment analysis
- Water balance study
- Capability assessment of hydraulic structures to handle flood discharges

### Preparation of Detailed Project Report (DPR)

• Detailed designs, hydraulic drawings, structural drawings, implementation drawings

## Implementation Phase

- Tendering and bid support
- Construction supervision

## Allied Services

- Environmental impact assessment
- Stakeholder engagement and social impact assessment
- Biodiversity enhancement plan
- Applied research and development

- Infiltration test
- Sediment analysis
- Condition assessment of hydraulic structures
- Point and non-point source of pollution study
- Flood assessment of drains
- Assessment of need of desilting and deweeding
- Design of hydraulic structures
- Bill of Quantities and cost estimation
- Operation and Maintenance (O&M) plan

## Post Implementation Phase

- O&M training for personnel
- Treatment system monitoring
- Capacity building of decision makers and infrastructure handling personnel
- Knowledge publications
- Development of financial and institutional plan



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