Annual Report 2020-21

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Consortium for DEWATS Dissemination Society

Annual Report 2020-21

Consortium for DEWATS Dissemination Society, Bengaluru

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President's Message

2020 was an unusual year with Covid-19 changing the way we live and work. The experience was no different for CDD Society. Despite the overwhelming challenges, we strived our best as we adapted to a grim & changed world.

In these difficult times, the necessity to ensure adequate clean water and sanitation to everyone could not be asserted more. WASH remains the first line of defense when it comes to human health. Covid-19 has reinforced that human immunity is the most potent tool against the pandemic, and absence of WASH compromises immunity of the most poor and vulnerable. As handwashing emerged as one of the most preferred precautionary measure against the Covid-19, the stark reality that billions of people still lack access to sufficient clean water for their daily needs including handwashing could not be more poignant.

To join the fight against the pandemic, CDD became part of the Covid Action Collaborative (CAC) , a city wide Covid response initiative by civil society partners in Bangalore, to help establish an Indian protocol to test sewage and develop an action plan to respond to COVID-19. We contributed our sector expertise in wastewater to the initiative by collecting sewage samples. These samples could indicate early warning signs and confirm prevalence of Covid in the city population. In addition, we also delivered Covid-19-related trainings to sanitation workers, health workers and local authorities in Bengaluru and neighbouring towns of Nelamangala and Devanahalli to improve the coping strategies of the warriors who were at the frontline of our societal response.

In spite of Covid, we managed to keep afloat our normal and regular operations, while complying with government regulations and undertaking necessary precaution. We supported the Rural Development Department of Karnataka to help build the capacities of government functionaries for Liquid Waste Management in rural Karnataka. We also constructed a toilet-bathing-dining facility for sanitation workers within the municipal office campus in Devanhalli, and rainwater harvesting systems for three of Devanahalli's schools wherein regular water supply is a problem. We also commissioned 6 DEWATS™ projects in different parts of the country. Our initiative to popularize nature based solutions in WASH continued and we trained WASH professionals across the globe by shifting to the online mode.

Two key achievements for us this year were the accreditation of our laboratory by NABL and release of two Fecal Sludge Management (FSM) publications. Our lab now has state of art facilities and is equipped to undertake advanced level tests. Our publications capture our learnings and experience in FSM. The first one titled "Guidance Document on design of FSTPs using Drying Bed Technologies" attempts to unpack Fecal Sludge Treatment Plant (FSTP) designs based on drying bed technologies and is meant primarily for civil and environmental engineers. The other publication titled "Insights from 5 years of FSM in Devanahalli" presents our critical learnings from five years of operating the FSTP at Devanahalli (post implementing it) to act as a guiding manual for FSTP operators, decision makers and other stakeholders.

We are also happy to inform you about the construction completion of 15 FSTPs for which we had provided design supports to our partner agencies – including Kali Bilod (Madhya Pradesh), Siddipet (Telangana), and Choudwar (Odisha) . I am also proud to inform you that in partnership with our network partner Inspiration, We demonstrated an integrated approach to revive the canal network combining sensitive intervention with community participation. The project won Alappuzha (Alleppey) Municipality the "Swachh Survekshan 2020 Award for Best Small City in Innovation and Best Practices".

As we move ahead, I would like to thank all our donors, partners and other stakeholders who supported us, and I look forward to your continued patronage to CDD Society in coming years.

President

Latha Raman Jaigopal

Abbreviations

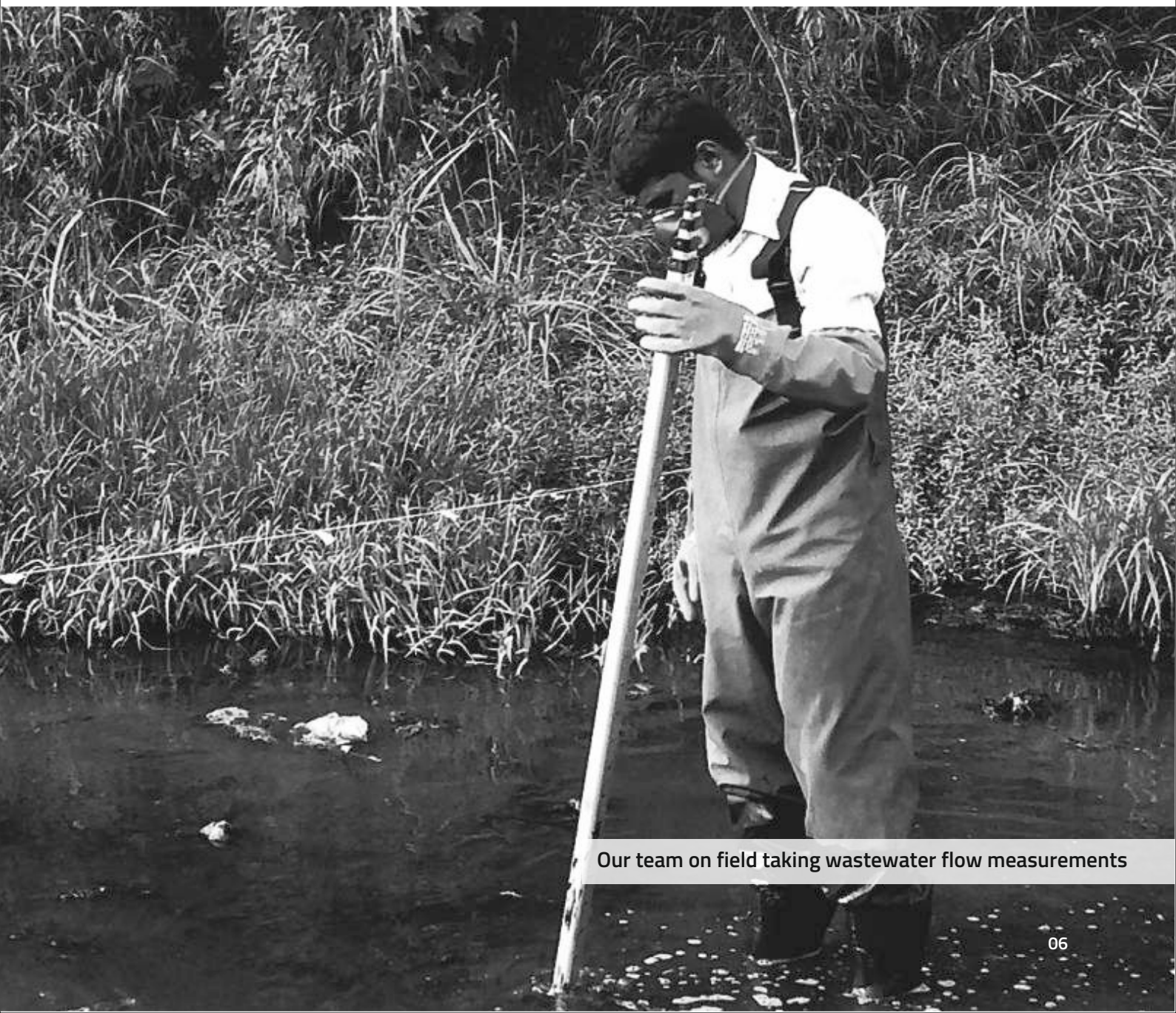
ASR	Anaerobic Stabilization Reactor
BORDA	Bremen Overseas Research and Development Association
BWC	Beedi Workers' Colony
CAWST	Centre for Affordable Water and Sanitation Technology
CDD Society	Consortium for DEWATS Dissemination Society
CAC	Covid Action Collaborative CAC
CEO	Chief Executive Officer
CSE	Center for Science and Environment
CSR	Corporate Social Responsibility
DEWATS™	Decentralized Wastewater Treatment System
DPR	Detailed Project Report
DWCC	Dry Waste Collection Center
DWSSM	Department of Water Supply and Sewerage Management
EAWAG	The Swiss Federal Institute of Aquatic Science and Technology
EE	Executive Engineer
EMPRI	Environmental Management & Policy Research Institute
ENPHO	Environment and Public Health Organization
EO	Executive Officer
FS	Faecal Sludge
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
GIZ	
GoN	Government of Nepal
GP	Gram Panchayat
IAS	Indian Administrative Service
IEC	Information Education Communication
IIHS	Indian Institute of Human Settlements
INNOQUA	an innovative, patent protected, award winning and scalable, fully ecological sanitation solution, available in multiple modular configurations adapted to local contexts and markets
KFD	Karnataka Forest Department
KILA	Kerala Institute of Local Administration
KMML	Kerala Minerals and Metals Limited
LWM	Liquid Waste Management
MSW	Municipal Solid Waste
NABL	The National Accreditation Board for Testing and Calibration Laboratories
NWSSTC	National Water Supply and Sanitation Training Center
O&M	Operation and Maintenance
P&RD	Department of Panchayat and Rural Development
RDWSD	Rural Drinking Water and Sanitation Department
RWH&R	Rainwater Harvesting and Recharging
STP	Sewage Treatment Plant
Susana	The Sustainable Sanitation Alliance
SWM	Solid Waste Management
TNUSSP	Tamil Nadu Urban Sanitation Support Program
ULB	Urban Local Body
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WASH-FIN	Water, Sanitation, and Hygiene Finance

About CDD Society

CDD Society's vision is to help create healthy and happy communities by ensuring a clean and sustainable environment around them.

Our Mission:

- To innovate, demonstrate and disseminate decentralized nature-based solutions for the conservation, collection, treatment and reuse of water resources and management of sanitation facilities.
- To deliver technical expertise grounded within the socio-economic context, through consulting, training and capacity building of government and non-government agencies, communities and other stakeholders in the water and sanitation ecosystem
- To be a workplace of choice for talent interested in social and environmental impact. We aim to attract the best talent in the environmental and social impact space and develop future leaders for the ecosystem.



Our team on field taking wastewater flow measurements

Access to water and sanitation remains one of the most facing problems across the globe. The availability of low cost WASH solution which can be built with local resources remain key to solving problem at scale. It is equally important that contextualised innovations factor in relevant socio, economic, political and environmental aspects which ensure low setup and maintenance costs of the solutions.

With growing urbanization and depleting resources in urban & peri-urban areas, the urgency to innovate and then scale these solutions is extremely critical.

This thinking around these holistic solutions should also be disseminated among different stakeholders in the water and sanitation ecosystem across the country in an effective manner to be able to have maximum impact and reach.

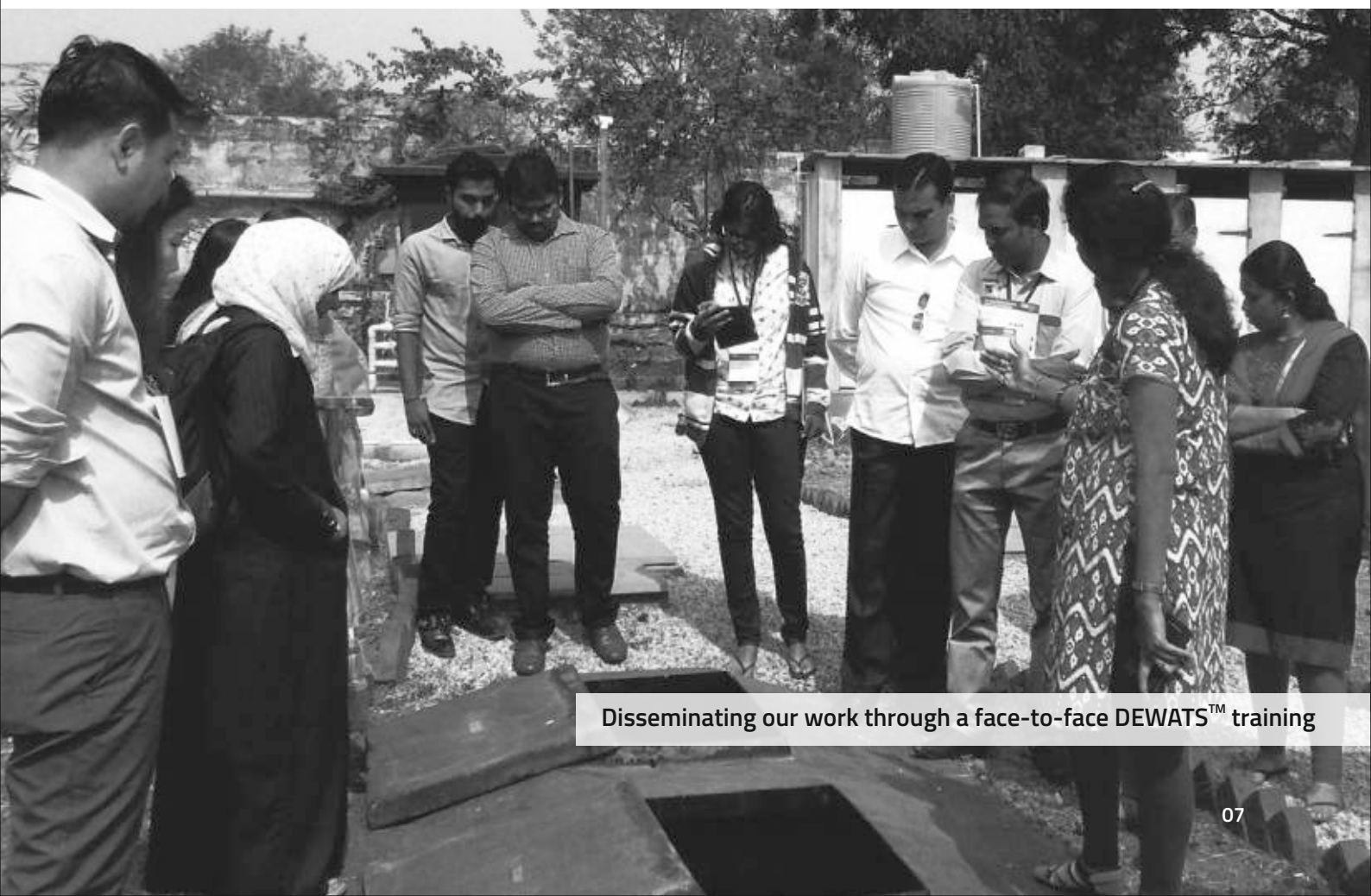
At CDD, we believe that "nature-based solutions" are more robust, sustainable and affordable. However, for specific contexts, we also realize the need for hybrid solutions that integrate natural systems and modern technologies appropriately. We exist to innovate, demonstrate and disseminate integrated and decentralized nature-based solutions for the growing water and sanitation management issues in communities across India and South Asia, thus improving health and well being in these communities.

Our Sectors:

- Wastewater Treatment
- Faecal Sludge Management
- Waterbody Rejuvenation
- Solid Waste Management

Our Services:

- Technical Solutions
- Capacity Building
- Applied Research
- Knowledge Publications & Dissemination



Disseminating our work through a face-to-face DEWATS™ training

Our Covid-19 Relief Efforts

Our efforts against the pandemic include:

Testing wastewater for traces of the virus to identify the community spread of Covid-19

International and national efforts have indicated that testing sewage can be an effective tool for monitoring the spread of the SARS-CoV-2 virus (the virus that causes COVID-19) in populations.

Research from past epidemics of the severe acute respiratory syndrome (SARS) caused by coronaviruses suggests that viruses are excreted in stools by infected human beings. Therefore, if sewage is routinely monitored, at strategic points, the presence of the virus can be detected. Mapping where the virus is found can help determine if there are infections within a geographic area. Known as wastewater-based epidemiology, this method has been used in the past - to keep tabs on the spread of Polio and to detect the use of drugs, especially cocaine.

Wastewater-based epidemiology for the SARS-CoV-2 virus can especially be useful for countries like India, which have densely populated urban residential areas where individual testing and social distancing is difficult. It is also a faster, cost-effective and practical alternative to individual testing, which has its limits. Importantly, it can help track the virus at an early stage, even among asymptomatic individuals.

With lockdowns creating enormous financial distress and food insecurity, an urgent need was felt for an early warning system. This prompted the Catalyst Group to build the Covid Action Collaborative (CAC), a network of individuals, 287+ organizations and networks representing the public, private, civil society, academic and other sectors who believe in pooling expertise and resources, to address the current pandemic. The collaborative aims to establish an *Indian* protocol to test sewage and develop an action plan based on evidence to manage COVID-19 infections.

We are part of this initiative. As Water and Sanitation Engineering partners, we are contributing through our sector expertise in wastewater by collecting and testing sewage samples.

Currently, urban local bodies (ULBs) have no alternate means to detect COVID-19 infections other than mass/herd testing. Efforts of this collaborative will help in identifying hotspots and vulnerable wards i.e. which wards appear to have increasing trends of positive cases. Accordingly, the health system can respond by increasing testing, availability of beds, oxygen concentrators and ventilators in those areas. It can also help identify where cases are reducing. Accordingly, vaccination drives can be planned to help suppress the case load.

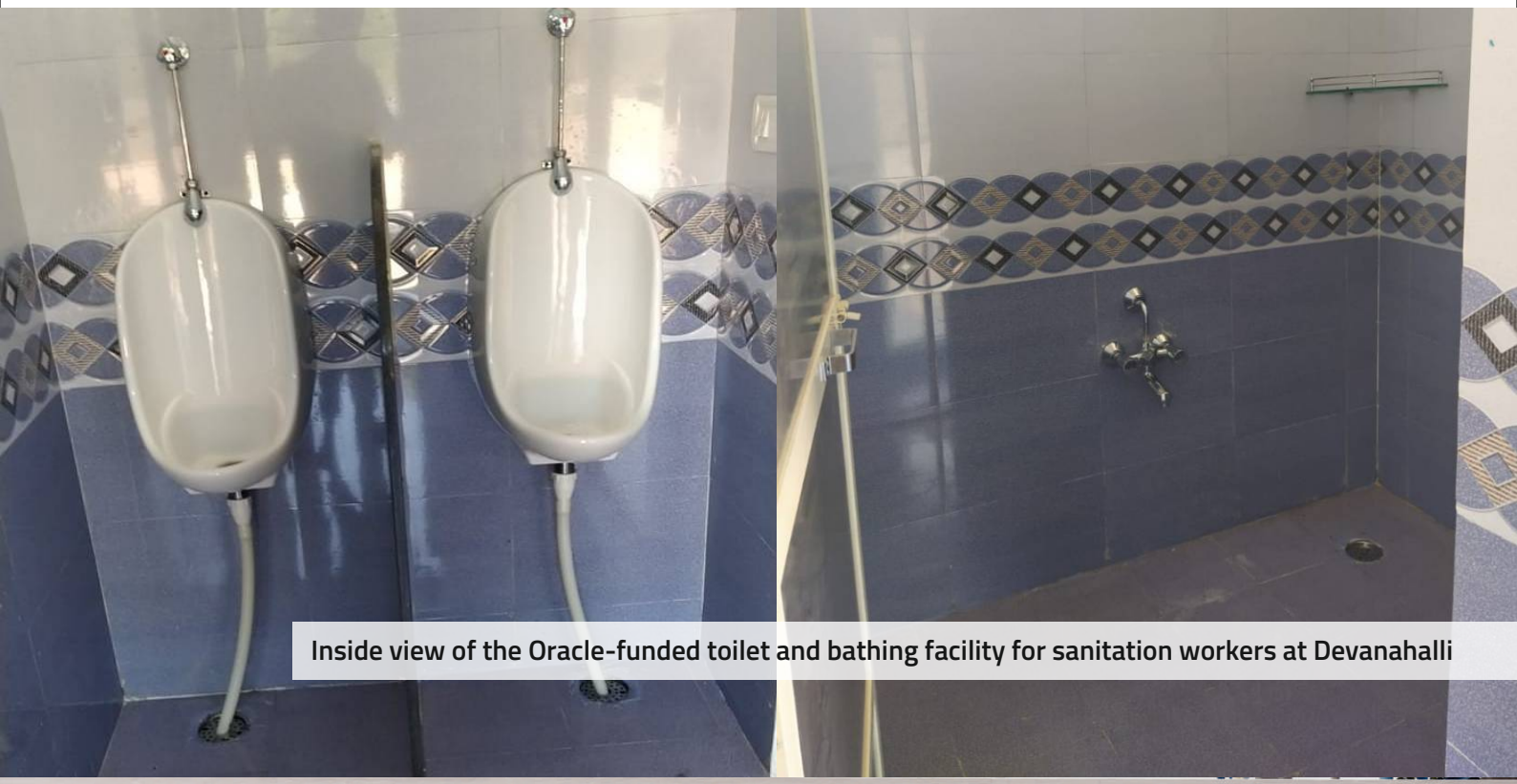
Collecting sewage samples

Implementation of a dedicated Sanitation Facility for frontline workers

Through CSR funds from Oracle, we set up a toilet block and bathing facility for sanitation workers in Devanahalli – along with a rain water harvesting system and a decentralized wastewater treatment system (DEWATS™) to treat (and reuse) all the wastewater generated at this facility.

This was done at the request of the Devanahalli Municipality itself after Covid-19 highlighted the absolute necessity of adequate hygiene facilities for sanitation workers; the hitherto unaddressed area – dignity of sanitation workers – which is a fundamental pillar to improving sanitation outcomes of any kind.

As per draft Municipal Solid Waste (MSW) Rules 2019, Municipalities must provide potable drinking water, toilets, changing rooms and first-aid facilities for their sanitation workers and other eligible workers involved in waste management. This is one of the first such initiatives in the country.



Inside view of the Oracle-funded toilet and bathing facility for sanitation workers at Devanahalli

External view of the Oracle-funded toilet and bathing facility for sanitation workers at Devanahalli

Capacity Building for frontline workers (sanitation workers, sweepers etc.)

We conducted a training on *'Safe collection and disposal of discarded Covid-19 medical waste and personal hygiene practices'* for **230 frontline workers** from Bengaluru City and three neighbouring towns/ municipalities – Kengeri, Nelamangala and Devanahalli. All our trainings were well-appreciated. The training content is ready and can be used for delivering further trainings.

At Kengeri

At Devanahalli

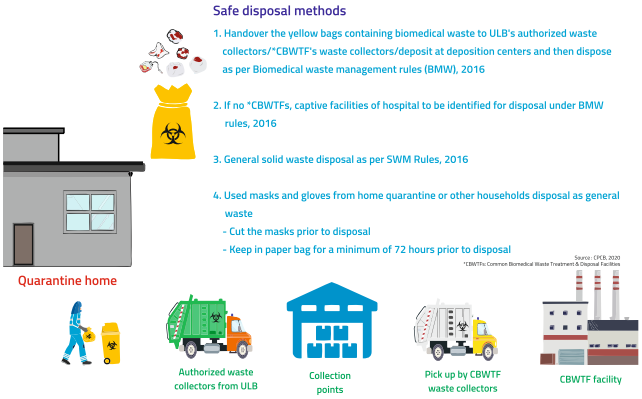
At Nelamangala

Preparation and dissemination of Covid19-related IEC material

We put together IEC material – **brochures, posters and pamphlets** – in English and Kannada on the following topics:

- Managing Covid-19 discarded, medical waste
- Do's and Do Nots to help stop the spread of the virus
- Handwashing practices
- Critical times one needs to wash their hands

Safe disposal of waste related to Covid-19 from quarantine camps/homes

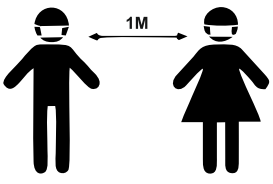


Safety Measures for Sanitation Health Workers

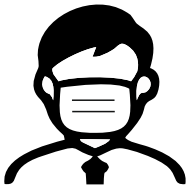
- Separate team of sanitation workers for collection of biomedical waste from quarantine homes or centres
- Spray the disinfectant on the bin used for yellow bag.
- Dedicated vehicles/trolleys for transport of biomedical waste
- Sanitization of vehicles with 1% hypochlorite after each trip
- Trainings to sanitation workers: Waste handling, Precautionary measures and Sanitization methods
- Workers should wear Personnel Protective Equipments (given below) while handling the waste from quarantine homes or centres.

Steps to Stop Spreading CORONA VIRUS

Do



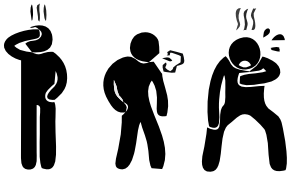
Keep a distance of 1 meter



Wear mask

Sneeze in the inner side of elbow

Cover nose and mouth with Kerchief while coughing and sneezing



Seek medical help if you have fever, Cough and Trouble breathing symptoms

Do not

Do not touch eyes, nose and mouth

No Spitting

Do not shake hands

Avoid crowding places

Wastewater Treatment

We commissioned 6 DEWATS™ projects this year. These projects, collectively, are treating ~100m^3 of wastewater daily, benefitting approximately 1,200+ people from the nearby community.

At the Sanitation Workers' facility at Devanahalli

The toilet-bathing-dining facility for sanitation workers set up with CSR funds from Oracle, comprises of a toilet block and bathing facility, a rainwater harvesting system as well as a DEWATS™, which treats all the wastewater, before being safely being disposed into a soak pit.

At Valley School on Kanakpura road

Bengaluru's Valley School had a reed-based greywater treatment system. However, the system had not been working for a while. It also needed to be modified so that the treated water would meet the new discharge standards and be reused. We have proposed that the system be modified to incorporate a DEWATS™ – this will help meet the required discharge standards as well as prevent odours, which was an issue with the previous system.

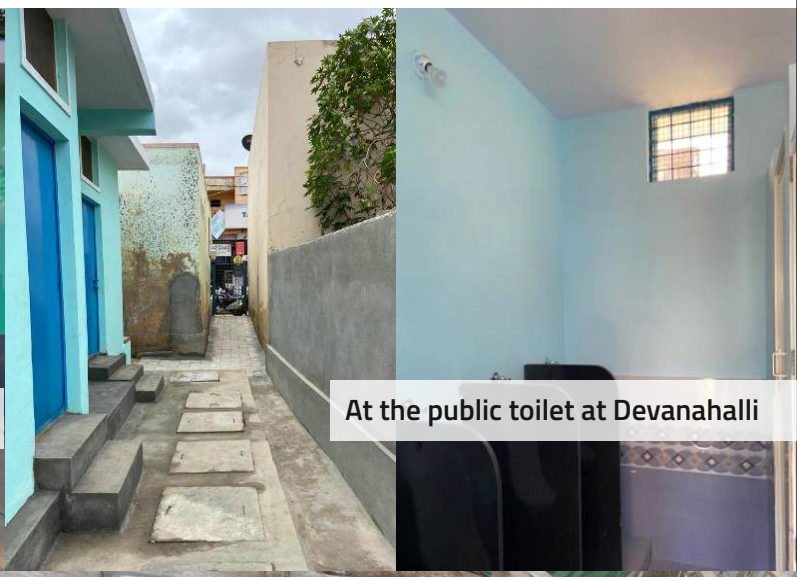
At a Public Toilet at Devanahalli

Through CSR funds from Oracle (FY19-20), we had setup a public toilet in the local market - on request of users and vendors in the market themselves. It comprises of one male and one female block - along with a DEWATS™ system.

At a large family home on Richmond Road

We are setting up a DEWATS™ for a large family home at Bengaluru's Richmond road. Though the building does not require an STP as per the current guidelines, the owners wish to install one in order to be prepared for any future change in regulations and also to explore the possibility of reusing the wastewater.

At the Sanitation Workers' facility at Devanahalli


At the public toilet at Devanahalli


At Valley School


At Richmond Road

At Mowade Layout, Kalmeshwar, Maharashtra

In December 2020, the DEWATS™ we set up for a 12-seater public toilet complex at Mowade Layout in Kalmeshwar was inaugurated. Kalmeshwar is a town of about ~30,000, located 25 km away from Nagpur. The treated wastewater is being reused for gardening.

At the Kerala Institute of Local Administration (KILA)

Managing wastewater through a sewer system is a challenge in Kerala given the highgroundwater table as well as topography. As a result, most towns/cities in Kerala have onsite or small cluster-based wastewater treatment systems. However, these systems are rudimentary - either simple pits or inappropriately designed septic tanks. This leads to groundwater and surface water contamination. GIZ thus set out to demonstrate appropriate and cost-effective treatment and technological options for improved wastewater management.

A pilot comprising of different types of small-scale household wastewater treatment and safe disposal facilities is being setup for a colony of 24 households within the KILA campus. Along with our network partner Inspiration, we are developing different treatment approaches/technological options and will be monitoring the performance of these systems too. Construction was completed and the project was inaugurated in October 2020.

At Mowade Layout, Kalmeshwar, Maharashtra

Faecal Sludge Management

We were pleased to see our efforts in Faecal Sludge Management fructify to projects on-the-ground.

With IIHS

Tamil Nadu Urban Sanitation Support Program (TNUSSP) is led by The Indian Institute of Human Settlements (IIHS). As technical partners, we prepared and submitted template designs for FSTPs for 23 towns in Tamil Nadu.

These towns (along with 26 others) cover 15% of the state which lacks underground drainage. Designs for 8 of these FSTPs were translated to the ground and commissioned this year.

The 40 KLD FSTP at **Kadayanallur**, a town of 90,364 people (21,076 households)

The shared mechanical FSTP (25 KLD) for Periyanaicken-Palayam (PNP) and Narasimhanaicken-Palayam (NNP) - the first in Tamil Nadu. **Kadayanallur**. It serves 1,08,286 people (30,528 households).

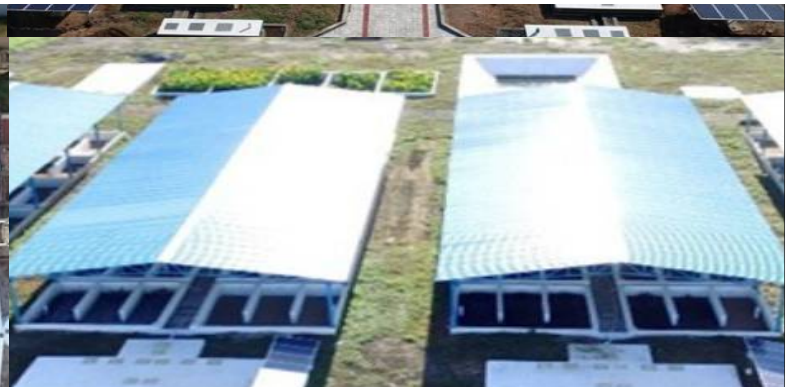
The 20 KLD FSTP at **Thuraiyur**, a town of 32,439 people (8,674 households)

The 30 KLD FSTP at **Dharapuram and Kolathupalayam**, a town of 73,826 people (21,299 households)

The 40 KLD FSTP at **Thirumangalam**, a town of 51,194 people (13,564 households)

The 20 KLD FSTP at **Kangeyam**, a town of 32,000 people (9,449 households)

The 20 KLD FSTP at **Sengottai**, a town of 51,651 people (13,847 households)



The 40 KLD FSTP at **Kovilpatti**, a town of 95,057 people (25,099 households)

With WaterAid

WaterAid, with support from The Bill and Melinda Gates Foundation, is piloting FSM interventions for peri-urban and rural areas in Chattisgarh, Madhya Pradesh and Uttar Pradesh. 3 project areas have been identified to serve as pilots:

- Kumhari cluster - a peri-urban setting in Chattisgarh
- Kali Billod cluster - a cluster of villages in Madhya Pradesh's Indore district
- Amethi cluster - a cluster of 11 gram panchayats in rural Uttar Pradesh

These clusters are in need of a treatment facility to manage the faecal sludge generated within their boundaries/areas. WaterAid reached out to us, to seek technical assistance for carrying out feasibility studies, designing appropriate treatment systems and supporting the implementation of the treatment facilities.

The solutions we propose in the DPRs i.e. the set of modules (for the treatment system) and cost structure (of the approach) keep the rural context in mind. It is expected that these pilots serve as model examples for rural sanitation and have an amplifying effect with regards to India's rural FSM story.

The construction of the FSTP at Kali Billod has been completed and is undergoing a trial run; construction of the FSTP for Kumhari cluster is under progress; and construction of the Amethi FSTP was inaugurated by Cabinet Minister Smriti Irani.

Cabinet Minister Smriti Irani at the inauguration for construction of the Amethi FSTP

Upcoming FSTP at Kumhari cluster

Completed FSTP at Kali Billod

With The Priyadhar Group

In a major thrust to waste management in Telangana, the State Government had started setting up FSTPs in 71 ULBs.

One of the first of those FSTPs was completed in March - at Siddipet. Since its commissioning, all faecal sludge collected in the town is being safely treated, posing no harm to the health of the people nor the environment.

The Priyadhar Group is one of the organisations supporting the Telangana Government in implementing these FSTPs. They were awarded the contract for construction of FSTPs in 18 towns, which require FSTPs of 4 different capacities – 10, 15, 20 and 25 KLD.

At Siddipet FSTP

With Practical Action

Choudwar is a town in the state of Odisha, 40 km from Cuttack. In partnership with Practical Action we have designed and provided construction monitoring support for the implementation of a FSTP in Choudwar. This is the third FSTP implemented with Practical Action - after Dhenkanal and Angul. This FSTP has a capacity of 12 KLD and is based on Unplanted Drying Bed treatment process. It began operations in January 2021 and has now received ISO Certification (9001:2015, 14001:2015 & 45001:2018).

The FSTP at Choudwar

Waterbody Rejuvenation

While The Saidpur Nallah and Sadarmangala Lake project were brought due to a close for reasons out of our control, progress was made on our other Waterbody Rejuvenation work.

Proposals for 5 lakes in Bengaluru

We supported Karnataka Forest Department (KFD) and BBMP's efforts in rejuvenating Bengaluru's lakes by creating and submitting 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 the Government as well as corporates.

Each proposal containes a clear action plan for the rejuvenation of each lake, covering:

- An understanding of the present condition of the lake
- Issues that plague the lake
- Key issues to be taken up on priority, along with a schematic solution
- Recommendations regarding implementable solutions

These efforts were funded by Hansa-Flex - a hydraulics solutions company - under their Christmas Donation program. Hansa-Flex in lieu of christmas gifts to employees and clients donates to three project ideas proposed by non-profits. Our project to prepare rejuvenation plans for Bengaluru's Lakes received the most votes in the 2019 edition.

Drain mapping at KR Puram Lake

Pipe measurement to calculate wastewater inflow

Taking flow measurements at KR Puram Lake

Water sampling at Sunkalpalya Lake

O&M of Mahadevapura Lake

After successful commissioning of the wastewater treatment system at Mahadevapura Lake in June 2019, United Way Bengaluru requested us to take up its operation and maintenance (O&M) for two years (till June 2021).

Being the first 1MLD-sized DEWATS™ that we have implemented, we took on O&M with the purpose of increasing our understanding and knowledge of plants this size. It was also an opportunity to better understand challenges of open channel inflows. A full-time operator has been recruited and trained for close monitoring of the plant.

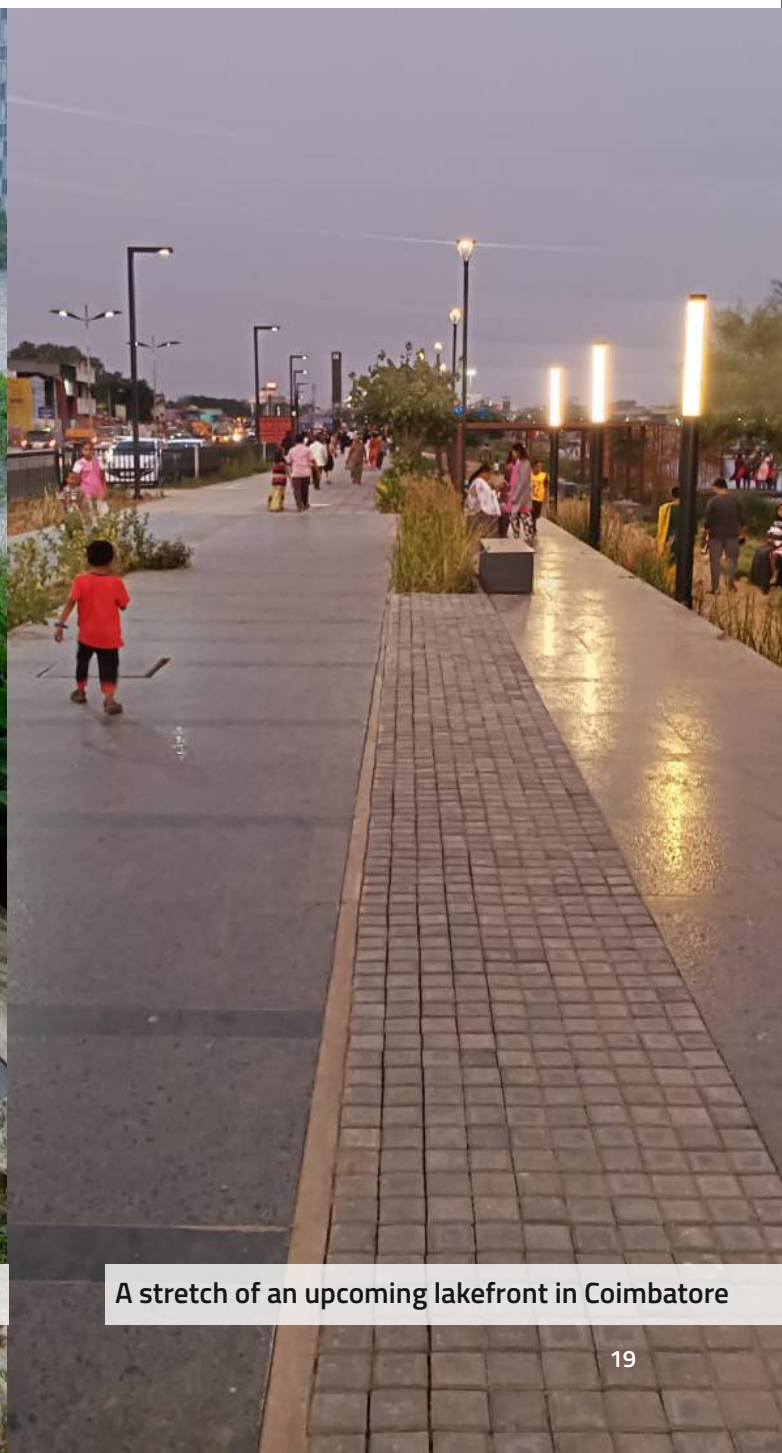
Coimbatore Smart City Project

On-ground work progressed on implementing the designs we submitted for the eco-restoration of 9 lakes in the city of Coimbatore. It will take another 2 years for the work to be completed.

Funded by the Coimbatore Smart City initiative, this project started in June 2017 and saw a complete closure in May 2019 with all deliverables being submitted:

- Design reports of all the lakes (which includes challenges and problems the lakes face, strategies and solutions, design and schematic drawings)
- Operation and Maintenance Plan for all the lakes
- Environment Impact Assessment (EIA) Report

At Mahadevapura lake



A stretch of an upcoming lakefront in Coimbatore

Alappuzha Canal Network

Work also progressed under the Alappuzha Canal Network project.

This is a collaborative effort between The Kerala Minerals and Metals Limited (KMML), the Cochin-based urban planning firm Inspiration (a CDD network partner organization) and CDD Society. It is aimed at rejuvenating part of the famed Alleppey Canal network, which has fallen victim to neglect, clogging of solid waste, sewerage and overgrowth.

We have provided around 200 households, along a 800m pilot stretch, with improved septic tanks, refurbished toilets and community/individual DEWATS™ – to arrest the inflow of sewage into the canals. This pilot will enable selection of the best solution to be scaled across the entire canal network.

The project won Alappuzha Municipality the *Swachh Survekshan* 2020 Award for Best Small City in Innovation and Best Practices.

Ongoing construction on the pilot stretch

Improved quality of water in the connecting drain

THE NEW INDIAN EXPRESS

NATION WORLD STATES CITIES BUSINESS OLYMPICS GOOD NEWS MOVIES PHOTO

STOCK MARKET BSE 53823.36 872.73(1.65%) NSE 16130.75

Home › States › Kerala

Swachh Survekshan: Alappuzha ranked best small city in innovations but Kerala fares poor overall

Alappuzha, which won in the category of cities with a 1-3 lakh population, was selected for its decentralised waste management for the last four years.

Published: 20th August 2020 10:32 PM | Last Updated: 20th August 2020 10:32 PM

A view of a church in Alappuzha. (Photo| Special Arrangement)

By Express News Service

KOCHI: Alappuzha municipality was recognised as the best small city in 'Innovations and Best Practices ' for decentralised wastewater treatment in Swachh Survekshan 2020, the central government's annual survey on cleanliness under the Swachh Bharat Mission.

The announcement, which was made in New Delhi on Thursday, was the only takeaway for Kerala in the national ranking of best cities in India on cleanliness. The results were

THE HINDU

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KERALA

Alappuzha municipality innovates and wins

Sam Paul A.

ALAPPUZHA, AUGUST 21, 2020 23:35 IST
UPDATED: AUGUST 21, 2020 23:36 IST

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Solid Waste Management

Our work in Solid Waste Management (SWM) this year was limited to the Oracle project, under which we had already begun working with the TMC (last year) to pilot a decentralized SWM approach in wards 7 & 8 of Devanahalli. This year, we put in efforts to monitor those activities in order to identify gaps (if any) and put in the necessary efforts to sustain those interventions.

In addition, operations began at the Dry Waste Collection Center (DWCC) post its inauguration in November 2020. At a capacity of 1 ton-per-day, the DWCC has started receiving dry waste from bulk generators and households regularly.

The first load of compost from the decentralized composter (installed last year) matured and was sold to the community.

A flower composter (*shishira*) was installed at the premises of three temples in these two wards, to manage flower waste from these temples.

The Dry Waste Collection Center

First load of compost being sold to the local community

Inauguration of the DWCC by Minister of Legislative Assembly of Devanahalli

First load of compost

Rain Water Harvesting in Government Schools

In addition to the facility for sanitation workers and SWM work mentioned above, efforts under the Oracle-funded project also included the installation of rainwater harvesting and recharging (RWH&R) units.

These units were setup at 3 Government schools at Devanahalli. This was undertaken as the focus of this phase of the grant is on addressing fresh water challenges in the town.

The taluk, in general, is dependent on groundwater (borewells) and surface water (the lake) as their source of water for daily activities. Hence, it is important to ensure that there is enough water available in borewells and the lake even during the Summer. Rainwater harvesting or recharging can help with this greatly. These units will boost the water source and also help in facilitating IEC i.e. by educating the students on the importance of rainwater harvesting and recharging units.

Construction of a rainwater harvesting and recharging unit

Our Rural Efforts

Liquid Waste Management in Karnataka

Last year, we initiated efforts in liquid waste management in rural Karnataka; by providing state-level technical support to pilot liquid waste management projects across 16 Gram Panchayats in the state.

We first prepared a workable excel-based model and strategy note for Liquid Waste Management (LWM) comprising only domestic wastewater in rural areas of the State. We then helped in the set of a few on-ground pilots to serve as good examples, helping to take these efforts across the state. 16 rural areas across all four divisions of the State – covering the wide range of geo-climatic conditions to be found in Karnataka – were selected for these pilots.

Bhagamandala Gram Panchayat was selected to roll out these pilots - as there is a High Court order against a PIL submitted by a person on pollution of the Cauvery river which requires an urgent submission of DPR and action plan for LWM by RDWSD. Post Bhagamandala, LWM activities will be scaled up across the other Gps.

Our scope of work includes: situational assessment, comprehensive LWM plans, detailed project reports, stakeholder consultations and construction monitoring support.

Ongoing construction at one of the pilot sites

We are providing technical handholding support through the process. These activities were kickstarted with trainings:
21st Dec, 2020: Sensitization workshop for state consultants, IEC consultants, WASH consultants, SH Consultants, CDD Consultants and Documentation expert
8th-9th Jan, 2021: Workshop for CEOs, EOs, EEs of all districts & supporting NGOs.

These trainings help participants understand how LWM plans are planned on-the-ground. Topics covered include - available approaches to LWM, an understanding of the typical issues in rural areas, and available solutions/technologies for greywater and blackwater management. Hands-on exercises that will help participants gain confidence in preparing LWM plans are also conducted.

By the end of the training, participants are able to prepare situation assessment reports, LWM action plans and identify suitable technologies/solutions for grey & blackwater management. In addition, they also understand the operation and maintenance requirements across the LWM value chain.

At Bhagamandala

Training officials on collecting data

Glimpse from a workshop

Development of rural FSM strategy and demonstration of FSM value chain, West Bengal

The Department of Panchayat and Rural Development (P&RD), Government of West Bengal (GoWB) is planning to undertake a holistic approach towards management of faecal sludge in rural areas. This includes: developing a rural FSM strategy, building capacities of stakeholders on FSM, and developing a scalable model district action plan.

Being a new area of intervention, the Department would like to focus on pilot implementation in one district - focusing on on-ground implementation of one FSTP servicing one GP/cluster of GPs.

UNICEF is supporting the Department in demonstrating a scalable FSM intervention (as per an agreed and signed Annual Work Plan 2020), and we are the technical partner for the project.

Capacity Building Workshop

Applied R&D

Expansion of Laboratory Services

In October 2020, our laboratory was accredited by NABL – a process which was initiated in the last financial year itself, but delayed due to Covid-19.

NABL is The National Accreditation Board for Testing and Calibration Laboratories. It is an autonomous body under the guidance of the Department of Science & Technology, Government of India, whose purpose is to provide accreditation to testing and calibration laboratories.

We now offer our laboratory facilities and abilities for external testing as well.

SAR Study published as a paper

Last year, in collaboration with EAWAG, we conducted research to better understand Sludge Accumulation Rate (SAR). Conducted in Sircilla, we studied SAR in different containment types in households, commercial and institutional establishments.

It was the first study to be conducted specifically for the Indian context. It helps understand how to make better estimations for FSM interventions that in turn will give more insights on how treatment systems can be better designed. Ultimately, this can aid to frame better policies and programmes to improve activities along the sanitation value chain.

In December 2020, the results from the study were published as an academic paper.

CDD Society Laboratory

- NABL Accredited laboratory for water and wastewater analysis

The Laboratory was established in 2010 to provide **water and wastewater testing services** to support CDD Society's internal research. In 2017, it was expanded to include **faecal sludge testing** abilities as well.

The **National Accreditation Board for Testing Laboratories (NABL)** accredited the lab for water and wastewater testing in 2020.

We have an array of advanced analytical instruments for the analysis of (organic, chemical and biological) parameters of water, wastewater and faecal sludge samples.

We provide high quality testing services and reports are issued with a turnover time of 10 days.

Services

CDD Society Laboratory offers sample analysis services as below

- Water
  - Ground water
  - Surface water
- Wastewater
- Faecal sludge

Collection of samples from client's location and transfer to laboratory is also privided at a price of INR 1,000/trip.
*Analysis cost may vary as per customer's requirements. Discounts will be provided for higher number of samples.

Testing Packages

Package 1 - Water
***INR - 3,300/sample**
TDS, Total hardness, Turbidity, pH, Chloride, Sulphate, Alkalinity, Residual Chlorine, Total Coliform, Colour, E. Coli

Package 2 - Water
***INR - 6,000/sample**
TDS, Total hardness, Turbidity, pH, Chloride, Sulphate, Alkalinity, Residual Chlorine, Copper, Iron, Calcium, Magnesium, Nitrate, Nitrite, Manganese, Fluoride, Hexavalent Chromium, E. Coli

Package 1 - Wastewater
***INR - 1,400/sample**
BOD, pH, TSS , Faecal coliform

Package 2 - Wastewater
***INR - 3,000/sample**
BOD, pH, TSS, Faecal Coliform, Ammoniacal Nitrogen as N, COD, Total Nitrogen, Phosphates as P

BOD - Biological Oxygen Demand | COD - Chemical Oxygen Demand | TDS - Total Dissolved solids | TSS - Total Suspended Solids

Testing services brochure

CDD Society Laboratory
Survey No.205. 1st Floor
(Opp. Beedi Workers, Colony Kommaghatta, Road,
Bande Mutt, Kengeri Satellite Town,
Bengaluru, Karnataka 560060
lab@cddindia.org
praveen.r@cddindia.org
09164045787

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Measuring SAR at Sircilla

Innoqua Pilot Study and conference

INNOQUA is a four-year project funded by the European Union. The project is being executed in partnership with 20 organisations in order to bring together expertise from multiple domains.

INNOQUA is a German acronym. The INNOQUA system is an innovative sanitation solution that is scalable and fully ecological. Available in multiple modular configurations, it can be adapted to local contexts and markets. An INNOQUA type of integrated solution has never been used for the treatment of wastewater before. These partners are thus working to demonstrate a novel, modular system for wastewater treatment based on the purifying capacity of earthworms, zooplankton and microalgae, operating under real conditions. This meets one of the goals of the project i.e. to promote sustainability in the wastewater sector and to test new alternative sanitation systems.

Pilot demonstrations of INNOQUA systems have been set up at sites in 10 countries, outside of India. These are: France, Ireland, Italy, Romania, Scotland, Spain, Turkey, Ecuador, Peru and Tanzania.

These pilots aim to demonstrate the long-term viability of modular and locally sustainable solutions under real conditions.

In India, the system has been set up near our office at Beedi Workers Colony (BWC). With a capacity of $1.5m^3$, it has been setup to treat wastewater from (toilets and bathrooms of) 9 households. The community consists of more than 150 households, with an average of five persons per household. The treated wastewater irrigates a community garden that provides fruit and vegetables to a nearby school, helping to improve the diet of local children who suffer from a high rate of malnutrition.

BORDA is the official partner for India and we are playing a supporting role. Our role is to provide laboratory support (for sampling and analysis of the wastewater samples) as well as support in set up of the unit at BWC.

In October 2020, we collaborated with the INNOQUA-Project and BORDA for an online conference on 'Vermifiltration for Wastewater Treatment: Progress and Prospects.'

The INNOQUA setup near our office at Beedi Workers' Colony

Pilot Studies

Improving design of the Anaerobic Stabilization Reactor

One way to treat faecal sludge (FS) is with an Anaerobic Stabilization Reactor (ASR). We have experimented with an ASR using a biogas digester and an anaerobic baffle reactor.

One of the main aspects for effective performance of an ASR is homogenization; and power is required to create turbulence in it. Over a period of time, we observed that there was scope of improving the design of the ASR – especially with regards to its manual agitation.

We developed a manual agitator and have conducted two cycles (so far) to check its feasibility and advantages. Results shows that, there is not much difference in the organic reduction with and without agitation in the ASR - although, the dewatering capacity of the FS digested with agitation has improved than that of FS digested without agitation. The experiment is not completed yet and currently, another cycle with modifications in the experimental procedures has been planned.

Greywater treatment system at CDD Society's office

We setup a system to treat the greywater generated from our office kitchen and dining area, which includes water from the kitchen sinks and RO reject water. The total quantity is estimated to be ~1,500 L/capita/day of wastewater. Prior to the setup of this system, the greywater was being drained into a chamber behind the kitchen where it got mixed with blackwater from the toilets. A 12 m^2 area behind the kitchen has been chosen for implementation of this system.

The system consists of a grease trap, planted gravel filter (PGF) and a percolation pit. Three different types of grease traps (of the same volume) - stainless steel, ferrocement and FRP - shall be installed to test their efficacy. The effluent from the grease trap is led into the PGF for secondary treatment. The PGF is made of an FRP vessel and contains various grades of gravel to aid in filtration. The treated water from the PGF is then led into a percolation pit made of concrete rings which helps in recharging groundwater.

ASR study

Greywater treatment system at our office

Capacity Building

This year was the first time we conducted our trainings online. We received alot of positive feedback for the participants of these trainings - 2 on FSM and one on DEWATS™. We also conducted an online training for Nepal's Department of Water Supply and Sewerage with TetraTech.

TetraTech

Nepal's Department of Water Supply and Sewerage Management (DWSSM) in the Ministry of Water Supply has recognized that a significant portion of the Government's sewerage management budget allocation – which in Nepal includes FSM – is going unutilized; in part due to insufficient capacity to design non-networked sanitation systems in urban areas. This made the Government of Nepal (GoN) realise the need for training its officials on good practices and principles of FSM and FSTP design - as a first step in building a practical knowledge base to improve capabilities and capacity.

To fulfil this need, DWSSM requested the support of the United States Agency for International Development's (USAID) Water, Sanitation, and Hygiene Finance (WASH-FIN) project to improve the capacity of government engineers to design FSM related infrastructure and systems for urban areas so that future allocated budgets are expended to deliver reliable and sustainable sanitation services.

With technical support from Environment and Public Health Organization (ENPHO, Nepal) and us, WASH-FIN Nepal developed training curriculum on FSM to build foundational capacities needed to design viable FSTPs in Nepal. The curriculum consists of a suite of educational materials and training workshops initially targeting public sector engineers (PSE) responsible for the planning, design, implementation and O&M of FSTP infrastructure and services.

The curriculum and materials will serve as training resources for the National Water Supply and Sanitation Training Center (NWSSTC) which will take the training forward.

USAID
FROM THE AMERICAN PEOPLE

Water, Sanitation and Hygiene
Finance (WASH-FIN) Project

Other Dissemination Activities

Online Webinars:

The Pandemic gave us ample opportunities to share our experience and learnings, through participation in different-themed webinars. These included:

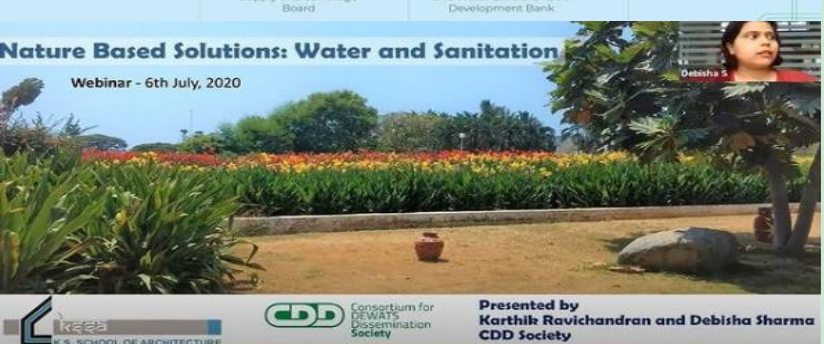
1. In July 2020, our team member Sandhya Haribal represented CDD at a webinar on *Opportunities for co-treatment of septage at sewage treatment plants (STPs),* where she presented a checklist for practitioners, which will help them assess the scope for co-treatment of septage at existing sewage treatment plants. She also covered the stages one should go through to convert existing STPs to co-treatment facilities - especially relevant for city officials and engineers.

2. In July 2020, our Governing Body member Latha Raman Jaigopal and our ex-Director of Programs, Ganapathy PG, participated in a panel discussion on *The Water-Centric City: Security and Recreation* at the event *Tomorrow's Liveable Cities*, organized by Arthan and BORDA.

The discussion was on how water can be better managed, treated and re-used to not only ensure that everyone has enough water for basic needs, but to reduce pollution and create recreational and beautification opportunities – given urban India is rapidly becoming water stressed and access to water highly unequal.

3. In July 2020, our team members, Debisha Sharma and Karthik Ravichandran, delivered a session on *Nature-Based Solutions for Water and Sanitation* to students from KSA School of Architecture. They enlightened students on wastewater, the water and nutrient cycle, and why wastewater is such a problem in India, sharing examples of how CDD has used nature-based solutions for Wastewater Treatment, Faecal Sludge Management and Waterbody Rejuvenation.

4. In August 2020, our team member Debisha Sharma, spoke about *Safety and Mechanization in Urban Sanitation: Innovations and Opportunities,* along with policy makers, city leaders and innovators, at a webinar organised by the National Faecal Sludge and Septage Management Alliance (NFSSM).



5. In August 2020, Ganapathy PG shared CDD's learnings and challenges from implementing DEWATS™ in numerous scales and contexts, at a webinar organised by the Centre for Science and Environment (CSE) on ***Decentralised Wastewater Treatment and Local Reuse For Citywide Sanitation and Improved River Health.***

6. In August 2020, Sandhya Haribal participated in a webinar organized by The Sustainable Sanitation Alliance (Susana), WaterAid, IRC and India Sanitation Coalition on ***Empowering Panchayats to Manage Wastewater.*** She presented on our approach and options for greywater management.

7. She also delivered a session on the ***Karnataka Rural Sanitation Strategy and model Bye-laws on Liquid Waste Management*** at a webinar on rural sanitation organized by the Center of Science and Environment (CSE).

Visitors to the Sanitation Exhibition

Given the restrictions imposed by Covid-19, the sanitation exhibition at The Center for Advanced Sanitation Solutions (CASS) did not see too many visitors.

This year' visitors included:
1) Students from Kengeri's OHANA Special School (February 2021)
2) 26 students from Bengaluru's Environmental Management & Policy Research Institute (EMPRI) (March 2021)

Visitors to the FSTP at Devanahalli

Ever since its launch, the FSTP at Devanahalli has seen thousands of visitors - all keen to learn about the successful running of this nature-based treatment plant - that too one which looks nothing like a typical waste management facility.

Key visitors included Smt. BB Cauvery, I.A.S, Director, Directorate of Municipal Administration (DMA), Government of Karnataka and Ms. Snehalatha, Incharge Executive Engineer, SWM Division of Directorate of Municipal Administration, who visited in February 2021.

The DMA is planning to scale-up FSM across urban areas of the state, and this visit was to help get a better understanding of FSM and FSTPs, in order to drive that larger effort.

Students from OHANA Special school

Students from EMPRI

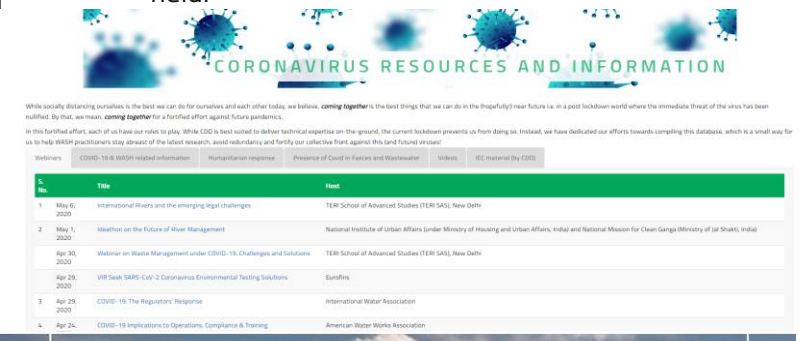
The DMA Karnataka team at the FSTP in Devanahalli

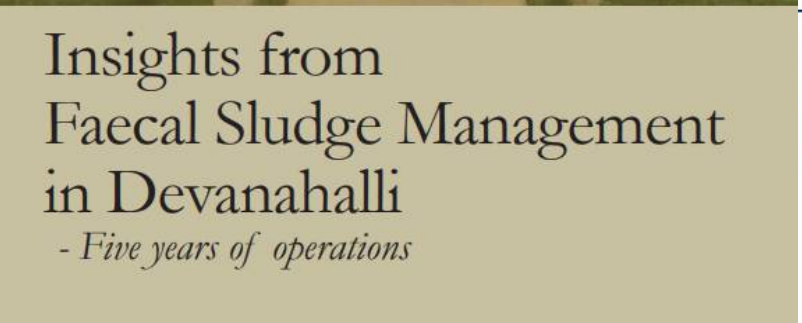
Upgraded Website and Publications

In March 2020, we launched an upgraded website – a new frontend as well as backend. The new website has a fresher look and loads faster, enabling a better user experience. With an easy-to-use backend, we are also able to put up new information quickly.

This enabled us to put up Covid-19 related IEC material as well as Covid19-WASH resources and information in a timely manner. These dissemination efforts were a small way for us to help WASH practitioners stay abreast of the latest research around Covid-19 and WASH.

Over the year, we have also put up 50 publications (brochures, factsheets etc.) of our projects and other learnings. 2 of these were key documents, through which we shared our learnings/insights from the field.

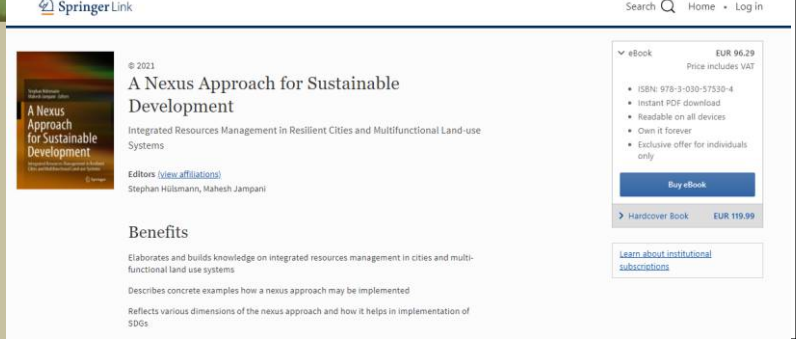




Referrals

In July 2020, we were featured in Interesting Engineering; and in December 2020, on india.mongabay.com.

A paper titled "Sustainable and Safe Use of Wastewater for Food Production in Peri-urban Areas of Karnataka, India," which we had submitted to The Dresden Nexus Conference 2017 was published in The SpringerLink in November 2020.



CONSORTIUM FOR DEWATS DISSEMINATION (CDD) SOCIETY
BALANCE SHEET AS AT MARCH 31, 2021

Amount in Rs.

Particulars	Sch	As at March 31, 2021		As at March 31, 2020	
SOURCES OF FUNDS					
Capital Fund	1		52,000		52,000
Foreign Funds And Reserves	1		4,71,49,406		1,02,12,023
Donors Fund	1		(29,28,326)		(29,28,326)
General Fund	1		3,48,84,390		3,29,93,957
			7,91,57,471		**4,03,29,654**
APPLICATION OF FUNDS					
Fixed Assets					
Gross Block	2	3,50,43,718		3,24,13,798	
Less: Depreciation		(2,25,09,265)		(2,00,78,376)	
Net Block			1,25,34,453		1,23,35,422
Investments			-		10,000
Current Assets, Loans & Advances:					
Cash & Bank Balances	3	3,95,49,757		81,15,717	
Loans, Advances & Deposits	4	2,71,39,992		2,54,70,053	
Inventory	5	46,41,941		46,41,941	
		7,13,31,690		3,82,27,711	
Less: Current Liabilities					
Statutory Liabilities	6	15,53,985		25,76,542	
Other Liabilities	7	22,29,700		66,55,755	
Programme Advances	8	9,24,986		10,11,181	
		47,08,672	6,66,23,018	1,02,43,478	2,79,84,233
TOTAL			**7,91,57,471**		**4,03,29,654**
Notes to Accounts	12				

The Schedule referred to above forms an integral part of the Balance Sheet;

Notes: (i) All expenses and income are on accrual basis of accounting;
(ii) Closing balance represents unutilized monies and is not represented by any specific earmarked bank balance.

For Consortium for DEWATS Dissemination (CDD) Society

Koshy Mathew
Treasurer

Anuj Malhotra
Secretary

CONSORTIUM FOR DEWATS DISSEMINATION * BENGALURU *

As per our report of even date attached
For M.A. BRAGANZA & ASSOCIATES
Chartered Accountants
Firm Registration No 000507S

M.A. BRAGANZA & ASSOCIATES * CHARTERED ACCOUNTANTS * BANGALORE 560 025

Ravishankar Hegde
Partner
ICAI Membership No. 232520

Place: Bangalore
Date : Novemeber 13 , 2021

CONSORTIUM FOR DEWATS DISSEMINATION (CDD) SOCIETY
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2021

Amount in Rs.

Particulars	Sch	Year ended 31-Mar-21	Year ended 31-Mar-20
Foreign Contribution & Income			
Grants - BMZ BNS		-	1,19,45,466
Grants - FC		-	23,05,911
Grants - BMGF	9	8,74,58,682	5,18,85,349
Grants - Charities Aid Foundation		51,00,000	38,47,296
Bank Interest		16,80,674	12,78,748
Other income		1,63,894	-
		9,44,03,250	**7,12,62,770**
Local Contribution & Income			
Grants - CSR	9	7,10,000	17,14,740
Annual Subscription Fees		51,000	46,000
Income in relation to Preservation of Environment		3,28,99,338	3,28,88,616
Other related Income		25,70,766	33,24,756
Bank Interest		3,34,526	53,735
		3,65,65,630	**3,80,27,847**
TOTAL - I		**13,09,68,880**	**10,92,90,618**
EXPENDITURE			
Staff Salaries and Other Benefits	10	6,04,65,024	6,66,99,112
Project / Programme Expenses	11	2,90,64,663	4,59,39,285
Depreciation on Fixed Assets	2	26,60,335	27,91,223
TOTAL - II		**9,21,90,022**	**11,54,29,620**
Surplus/(Deficit) I - II		**3,87,78,859**	**(61,39,002)**
Surplus/(Deficit) transferred to -			
Donor Fund		3,43,60,304	(91,15,962)
General Fund		39,87,069	39,48,130
FC Reserve Fund		4,31,486	(9,71,170)
Total Transferred :		**3,87,78,859**	**(61,39,002)**

The Schedule referred to above form an integral part of the Income & Expenditure Account;
Note: All expenses and income are on accrual basis of accounting;

For Consortium for DEWATS Dissemination (CDD) Society

Koshy Mathew
Treasurer

Anuj Malhotra
Secretary

CONSORTIUM FOR DEWATS DISSEMINATION * BENGALURU *

As per our report of even date attached
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Ravishankar Hegde
Partner
ICAI Membership No. 232520

M.A. BRAGANZA & ASSOCIATES * CHARTERED ACCOUNTANTS * BANGALORE 560 025

Place: Bangalore
Date : Novemeber 13 , 2021

CONSORTIUM FOR DEWATS DISSEMINATION(CDD) SOCIETY
RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED MARCH 31, 2021

Amount in Rs.

Particulars	Sch	Year ended 31-Mar-21	Year ended 31-Mar-20
Opening Balance			
Cash		96,889	1,04,597
At Bank		80,18,827	95,08,018
Receipts			
Annual Subscription Fee	9	51,000	46,000
Income in relation to Preservation of Environment		3,28,99,338	3,28,88,616
Other related Income		25,70,766	35,52,604
Grant Received		9,32,68,682	7,16,98,762
Savings Bank Interest		20,15,200	13,32,483
Sale of fixed Asset		2,78,000	-
Advances Recovered	4	10,00,056	21,52,131
Total		**14,01,98,759**	**12,12,83,213**
Payments			
Staff Salaries and Other Benefits	10	6,04,65,024	6,66,99,112
Project / Programme Expenses	11	2,77,90,488	4,59,39,285
Fixed Assets Purchased	2	29,73,472	(5,19,006)
Advances Paid	4	43,05,690	7,75,417
Statutory Liabilities Settled	6	10,22,557	(2,84,225)
Programme Advance Paid	8	86,195	(1,86,593)
Other Liabilities Settled	7	40,05,576	7,43,505
Closing Balance			
Cash	3	34,916	96,889
At Bank	3	3,95,14,840	80,18,827
Total		**14,01,98,759**	**12,12,83,213**

For Consortium for DEWATS Dissemination (CDD) Society

Koshy Mathew
Treasurer

Anuj Malhotra
Secretary

CONSORTIUM FOR DEWATS DISSEMINATION * BENGALURU *

Auditors' Report

We have examined the above account with the books of account and vouchers maintained by Consortium for Dewats Dissemination(CDD) Society and have found the same to be in accordance therewith and the information and explanations furnished to us and gives a true and fair view of the transactions of the Local Contribution for the year ended March 31, 2021.

As per our report of even date attached
For M.A. BRAGANZA & ASSOCIATES
Chartered Accountants
Firm Registration No 000507S

M.A. BRAGANZA & ASSOCIATES * CHARTERED ACCOUNTANTS * BANGALORE 560 025

Ravishankar Hegde
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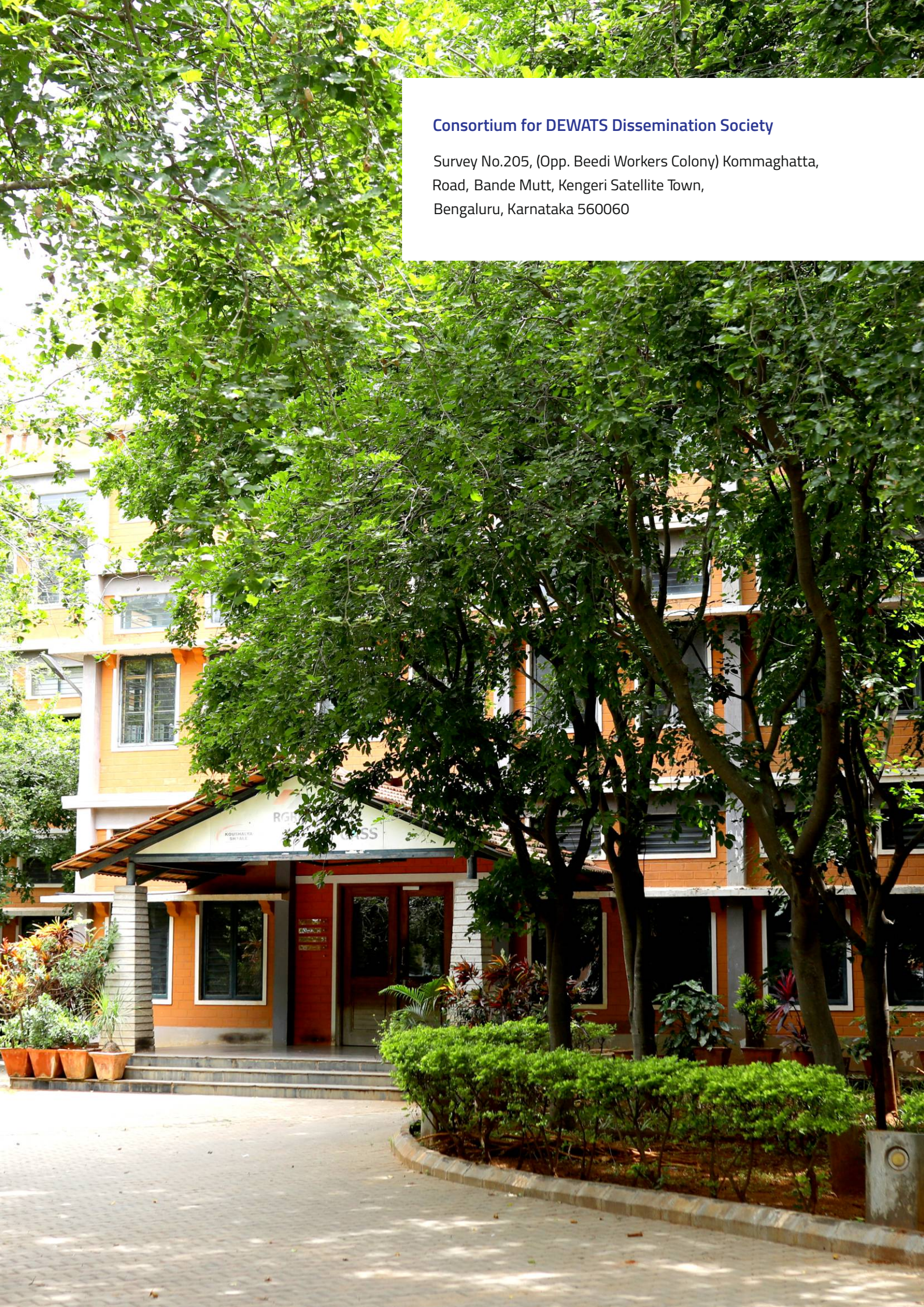

Consortium for DEWATS Dissemination Society

Survey No.205, (Opp. Beedi Workers Colony) Kommaghatta,
Road, Bande Mutt, Kengeri Satellite Town,
Bengaluru, Karnataka 560060