"CDD's DEWATS experience - Learnings & Challenges"

Presented By:
GANAPATHY P.G
DIRECTOR OF PROGRAMS
Not for profit established in 2005

30+ Partners all over India

BORDA & CDD Network (22 Partners)
Our Solutions

All our products and service portfolio are designed keeping the community at the centre, to create long lasting impact

Integrated Urban Water Management

Wastewater Treatment & Reuse
Waterbody Rejuvenation
Faecal Sludge Management
Solid Waste Management
What is DEWATS?

**Process**
- Preliminary/Primary Modules: Sedimentation
  - Removal of easily settable solids
- Secondary Modules: Anaerobic Decomposition
  - Removal of easily degradable organic solids
- Advance secondary/Tertiary Modules: Aerobic Decomposition
  - Removal of more degradable solids
- Post Treatment: Disinfection
  - Further Polishing

**Modules**

**Cumulative Treatment Efficiency**
- Influent of BOD: 250-300 mg/l
- Preliminary/Primary Modules: 30-40%
  - 180-200 mg/l
- Secondary Modules: 70-75%
  - 60-50 mg/l
- Advance secondary/Tertiary Modules: 85-90%
  - 30 mg/l
- Post Treatment: ~95%
  - <20 mg/l
### Why DEWATS?

#### 1. Versatile

- Applicable to wide varieties of context
- Treats organic wastewater from domestic and industrial sources
- 1 m$^3$/day - 1,000 m$^3$/day inflow
- Customisable, Modular and Expandable

#### 2. Robust

- Tolerance to inflow fluctuations – both organic loads and hydraulic loads (can operate at 20% design loads)
- Passive system with little or no reliance on electromechanical systems
- Self governing; low operations skill

#### 3. Low O&M

- Requires no/minimum electricity, no chemicals or external additives
- Does not require skilled manpower for O&M
- Desludge once in 2-3 years; maintaining PGF is similar to gardening
- Very Low O&M cost

#### 4. Simple & efficient

- Simple technology:
  - Easy adoption by masons
  - Executable with local resources and skills
- Anaerobic process:
  - Produces less sludge
  - Completely sealed, space above tanks usable for various purposes
DEWATS - applicable in wide ranging contexts to treat Domestic Wastewater

Over 400 systems built by CDD & Network
CHALLENGES AND LEARNINGS

1. Keeping up with Discharge and reuse Standards
2. Optimizing Footprint & CapEx
3. Improving efficiency of AF module
4. Broadening the Application areas
DEWATS needs to adapt to evolving discharge standards and new reuse applications...

In India, effluent discharge standards have been dynamic

Achievable quality from DEWATS (Conventional Modules)

- MoEF & CC, 2017 (For non-metro cities), 30
- MoEF & CC, 2017 (For metro cities), 20
- MoEF & CC, 2015, 10
- General Norms, 1986 (for marine coastal areas), 100
- General Norms, 1986 (for land Irrigation), 100
- General Norms, 1986 (for Inland surface waters), 30
- General Norms, 1986 (for public sewers), 350

BOD, mg/l

0 20 50 100 150 200 250 300 350 400
Our innovations have focused on alternatives to PGF for higher treatment efficiency...

Robust tertiary treatment systems aligned with the DEWATS approach

- Vortex
- Aeration tanks
- Sand & Carbon filter
- Vertical flow wetlands and similar systems

Module wise DEWATS Cost & Area
DEWATS has been getting more efficient on capex and land area requirements...

**Innovations**

- Reduction in number of ABR chambers
- Integration of balancing tank with pump arrangements
  - Higher hydraulic depth
- Alternatives to PGF
- Construction Materials
There is scope to innovate on alternative filter media...

Common Filter Media used in the DEWATS Anaerobic Filter

- **Gravel**
  - Weight of Media
  - Low cost in comparison with other media

- **Cinder**
  - High price for good quality
  - Initial leaching occasionally
  - High surface area / m3 +

- **Corrugated Plastic Pipes**
  - Treatment efficiency?
  - Longevity of the product
  - Questions about plastic leaching
  - High surface area / m3 +++

- **Plastic Bio-media**
Considerations: Efficiency of Cost, treatment, implementation and environmental

- Coal
- Plastic fibers Like - mats
- Coconut Husk
- Broken pieces of clay pots/Tiles

Efforts are ongoing to explore alternate filter media...
Learning: DEWATS can be applied in many new emerging contexts through hybrid systems

- **Open Channel flow**
  - Waterbody Rejuvenation
  - Grey water in storm drains

- **High end Reuse**
  - Flushing
  - Car Washing

- **Low organic load in inflow**
  - Grey water treatment
  - Percolate from sludge drying beds

- **High organic load inflow**
  - Slaughter House
  - Public/Community toilet
  - Fecal Sludge treatment

- **Higher hydraulic flows**
  - >500KLD
  - Waterbody Rejuvenation
  - Small Towns
  - Large community settlement

- **Unfavorable ground levels for Gravity flow based system**
  - Rocky strata
  - Very Low sewer inlet level
Learning: DEWATS can be applied in many new emerging contexts through hybrid systems.
Contact Us

**Address:**
Survey No.205 (Opp. Beedi Workers Colony), Kommaghatta Road, Bandemath Kengeri Satellite Town, Bangalore 560060, Karnataka, India.

**Email:** ganapathypg@cddindia.org
**Website:** www.cddindia.org