Decentralized Wastewater Treatment

DEWATS is an approach, rather than a hardware package

Guided by following principles:

- Reduce sewer networks
- Simplify sewer by applying SOLID-FREE SEWER
- Involve local labour and material available
- Construct what requires low maintenance and no energy
- Generate Biogas for energy
- Generate water and nutrients for irrigation in agriculture and food-garden

Applicable for households, settlements, institutions, hospitals, schools,…and small and medium sized enterprises (SME) for the treatment of domestic and organic industrial wastewater

→ Up to 2,000 households per DEWATS unit
DEWATS fills a Gap

Conventional centralized systems

Common on-site systems

DEWATS Approach

Costs
Decentralized Wastewater Treatment

Centralized system

Decentralized system

Single House

Housing Colony

Layouts
Decentralized Wastewater Treatment

Advantages-Decentralization

- Is beneficial from the point of construction & maintenance of sewer system
- Size of sewer pipe and depth of construction is lesser, hence not expensive
- Re-use of the treated wastewater in agriculture and food garden
- Integration of local construction & operation capacities and job creation
- Collection and utilization of biogas for cooking and heating

Disadvantages-Decentralization

- More maintenance on decentralized level
- Cost and area required for the treatment infrastructure is more

Compare investment and O&M cost of a decentralized and centralized approach

...and then decided for your project
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Sanitation with biogas & water recycling

- Biogas/DEWATS System
- Domestic wastewater in
- Biogas out
- Kitchen lop in
- Treated water for gardening out
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DEWATS modules

- Biogas plant
- Anaerobic baffled reactor
- Anaerobic filter
- Planted gravel filter
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DEWATS effluent quality

BOD and COD reduction in different modules

[Graph and image showing reductions in COD and BOD from raw sewage to outlet pond]
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Water re-use

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www.ted-biogas.org
www.borda-sadc.org
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- Biogas yield 8 – 10 l per capita per day
- Gas pressure 30 – 100 cm water column
- Biogas consumption of a ordinary one flame stove 300 l per h
- Applicable for cooking and heating lightning
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**DEWATS figures**

- **Investment cost:** 8,000 – 15,000 Rand per m³ (m³/d)
- **Running cost:** 1,0 – 3,0 Rand per m³ (O&M)
- **Required area:** 10 – 25 m² per m³
- **Type of wastewater:** domestic, organic food industry WW
- **Treatment capacity per unit:** up to 150 m³ per day
- **Life time:** 30 – 40 years
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Construction of Biogas plants

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Biogas/DEWATS plants for households
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Construction of ABR reactors for institutions and settlements
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Construction of horizontal filter (PGF) for institutions and settlements
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Lesotho 28 Biogas/DEWATS plants for 6-2,000 people are constructed and in operation; 6 plants in planning

South Africa 2 DEWATS plants in planning (Durban and Waterberg)

Zambia > 20 Biogas/DEWATS plants in planning

World wide more than 700 DEWATS plants for operation through the BORDA network

References
DEWATS pilot project at Newlands Mashu / Durban

A cooperation project with eThekwini Municipality (EWS), UKZN & Newlands Mashu

**Goals:**

- Piloting DEWATS and agriculture research on treated wastewater
- 84 households to be connected
- approx. 40 m³ to be treated

**Diagram:**

- ABR – anaerobic baffled reactor
- SDB – sludge drying bed
- PGF I, PGF II – planted gravel filter
- R&D container
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„Thinking long-term - Acting Now“