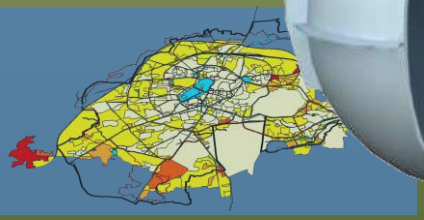


# Prefab-

# DEWATS

The new pre-fabricated modular solution for decentralized wastewater treatment

Emergency Sanitation Workshop, Delft June 2012

BORDA

Andreas Ulrich
BORDA Director

# BORDA / DEWATS

- Established 1977 as a non profit organization in the field of development cooperation, based in Bremen, Germany
- BORDA developed the DEWATS system in 1998 and facilitated more than 1.000 project implementations.
- DEWATS = decentralized wastewater treatment systems
- Under the influence of the Tsunami catastrophe, BORDA developed pre-fabricated DEWATS systems, in 2005

# *Pre-fabricated DEWATS*

Prefab-DEWATS components and modules are manufactured by certified companies (Indonesia since 2011, India 2012, Kenya 2013.

*Prefab-DEWATS*

# *prefab-DEWATS and Emergency Sanitation topics*

- **Topic "Raised Latrines":** prefab-DEWATS is a water based treatment system and designed to be connected with latrine / toilet system.
- **Topic "Desludging":** As connected permanent with the latrine system no desludging or transport before treatment necessary. Minimum sludge production under anaerobic conditions leads to long desludging interval of 2-5 years.
- **Topic "Disposal":** The output of the treatment process is treated wastewater according to specified performance data

# 2. *prefab-DEWATS* technology

- Multi-chamber digesters with partial separation of the anaerobic microbiological processes cause a significant acceleration of the anaerobic digestion process.
- Retention of microorganisms within the treatment system causes a maximizing of the flow-capacity and a minimizing of the reactor volume.
- Absence of moving parts, the anaerobic fully mixed digester principle and smart fluid engineering ensure low maintenance.

# 3. Core characteristics

**A proven solution:** over 1000 DEWATS treatment plants in operation

**Effective & efficient:** meets most official effluent discharge standards at low-investment and running costs

**Estim. Investment costs:** including transport & installation Euro 10,- per Person

**Low maintenance:** Minimum maintenance requirements, no skilled personnel required for O&M. No energy input required.

**Modular lightweight design**

- allows for efficient logistics
- allows for treatment of different hydraulic and pollution loads
- short installation time (1-3 day per unit)

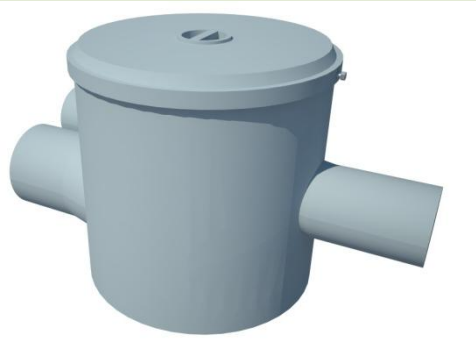
**Product lifetime:**

- +/- 15 years
- reuse of the system during rehabilitation phase recommended

**Recyclables and reuse options:**

biogas > cooking, effluent for irrigation

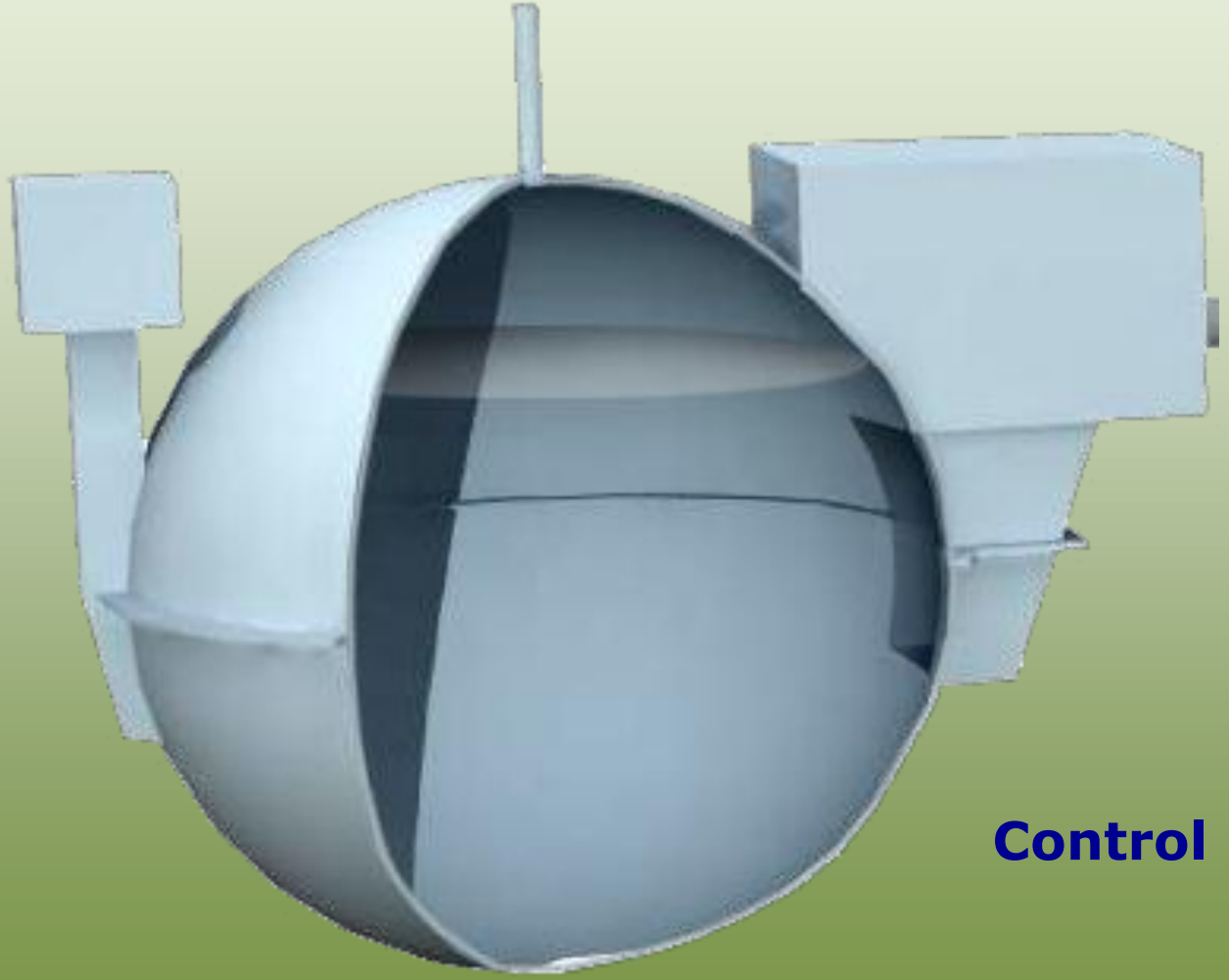
## Divider-weir



## Grease trap

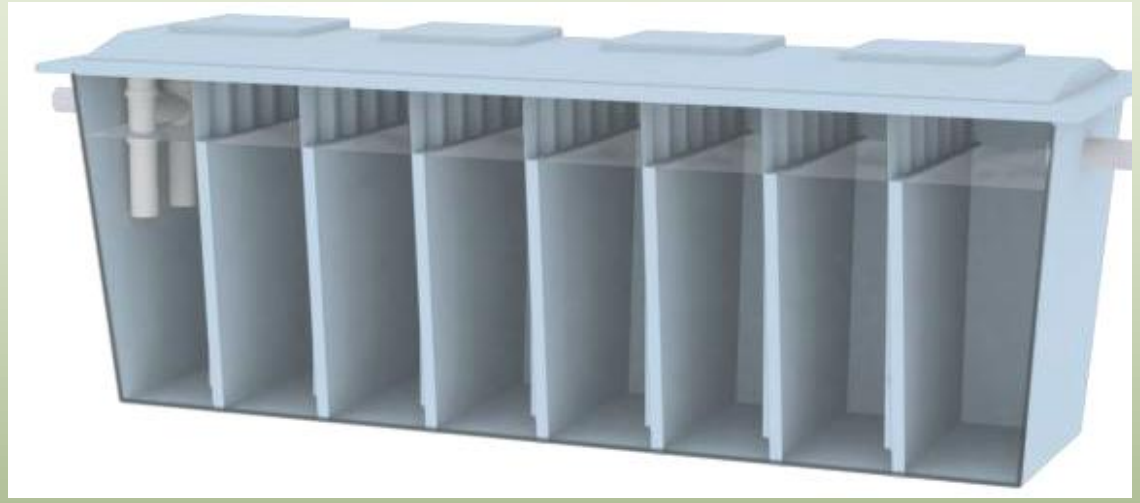
**Conventional settler / sedimentation chamber**

## Biogas settler



## Control box

## Anaerobic baffled reactor - ABR



Large vessel

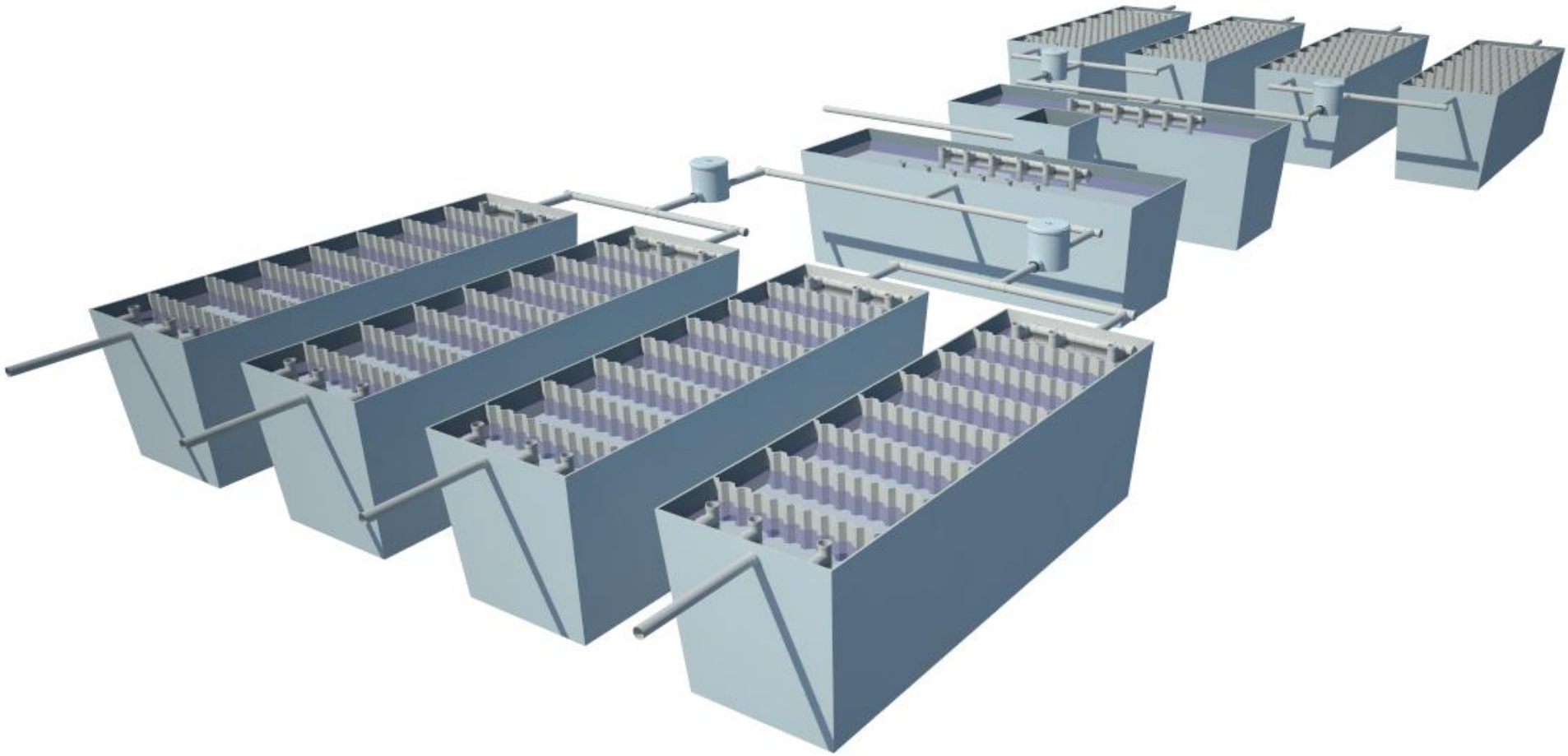
Small vessel

Medium vessel

# 5. *prefab-DEWATS* configurations

| | Conditions | | >> | Modular Solutions | | | |
|---|---|---|---|---|---|---|---|
| | Sanitation Type and Wastewater Volume | Wastewater inflow/day ($m^3$) | >> | Biogas Settler | Small Vessel | Medium Vessel | Large Vessel |
| 50 persons | Shallow sewer system (SSS) 100L/person/day | 5 | >> | | 1 | 1 | |
| | Public sanitation facilities 60L/person/day | 3 | >> | 1 | | 1 | |
| | Sanitation blocks (emergency sanitation) 15L/person/day | 0,75 | >> | | | 1 | |
| 100 persons | Shallow sewer system (SSS) 100L/person/day | 10 | >> | | 1 | | 1 |
| | Public sanitation facilities 60L/person/day | 6 | >> | 1 | | | 1 |
| | Sanitation blocks (emergency sanitation) 15L/person/day | 1,5 | >> | 1 | | 1 | |
| 150 persons | Shallow sewer system (SSS) 100L/person/day | 15 | >> | | 2 | | 1 |
| | Public sanitation facilities 60L/person/day | 9 | >> | 1 | 1 | | 1 |
| | Sanitation blocks (emergency sanitation) 15L/person/day | 2,3 | >> | | | | 1 |
| 200 persons | Shallow sewer system (SSS) 100L/person/day | 20 | >> | | | | 2 |
| | Public sanitation facilities 60L/person/day | 12 | >> | 1 | | | 2 |
| | Sanitation blocks (emergency sanitation) 15L/day/person | 3 | >> | 1 | | | 1 |
| 500 persons | Shallow sewer system (SSS) 100L/person/day | 50 | >> | | | | 6 |
| | Public sanitation facilities 60L/person/day | 30 | >> | 4 | | | 5 |
| | Sanitation blocks (emergency sanitation) 15L/person/day | 7,5 | >> | 2 | | 1 | 2 |
| 1000 persons | Shallow sewer system (SSS) 100L/person/day | 100 | >> | | | 6 | 8 |
| | Public sanitation facilities 60L/person/day | 60 | >> | 6 | | 1 | 8 |
| | Sanitation blocks (emergency sanitation) 15L/person/day | 15 | >> | 3 | | 2 | 4 |

# 6. Modular applications



# Planning

- Evaluation of site conditions and assessment of applicability
- Estimation of required number and types of modules
- Cost estimation including costs for transportation and installation
- Detailed design, BoQ
- Implementation task lists

# Installation

- Organisation of transport of materials
- Provision of experts for on-site installation
- Commissioning

# Post-implementation services

- Operation and maintenance training for user and operator
- Facilitation of community health and hygiene training

# 8. Conclusion for the future product solution

- Prefab-DEWATS characteristics comply with most EmSan requirements
- Quick installation, mobility, easy collection, treatment efficiency and safe discharge of wastewater.
- It can easily be connected with latrine systems
- It can be easily modified to serve as a sludge treatment system
- Function above ground is possible

# Thank you for your attention!

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