

Sustainable wastewater management – operation and maintenance management models

IWA World Water Congress Busan, Korea 2012



Founded in 1977 in
Bremen, Germany

Headquarters: Bremen

Regional Projects:

- Southeast Asia
- South Asia
- Southern Africa,
- Latin America

Main Donor: BMZ

Cooperation's: UNICEF, WSP,
GIZ, JICA, AusAID, IDRC, EU



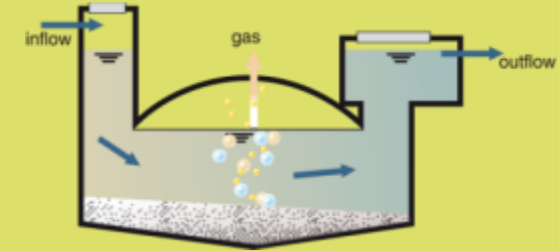
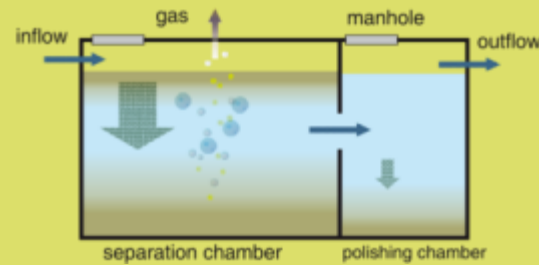
Improved Sanitation for All!

“The Mission of BORDA is to improve the living conditions of disadvantaged communities and to keep the environment intact through the expansion of Basic Needs Services in the areas of decentralised sanitation, water and energy supply as well as wastewater and solid waste disposal.”

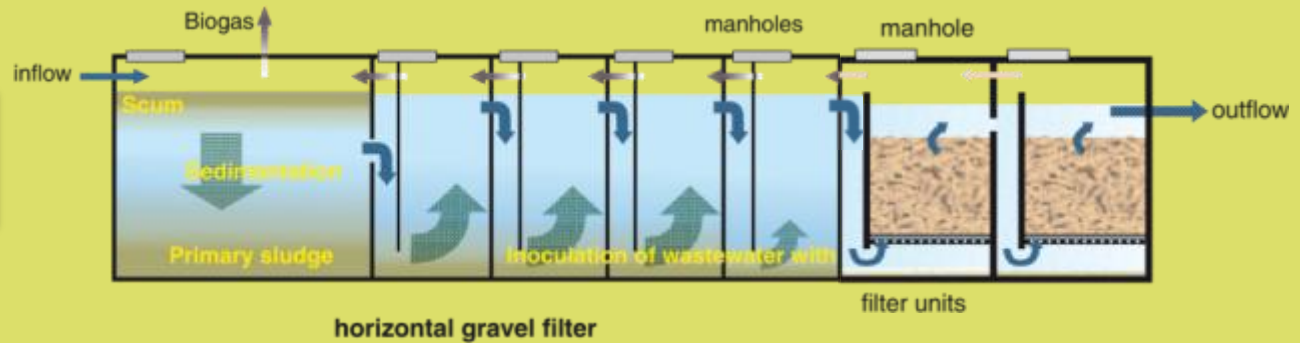


The DEWATS System

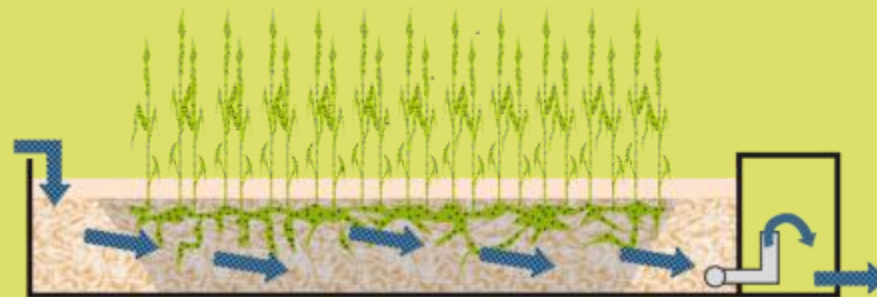
Sedimentation



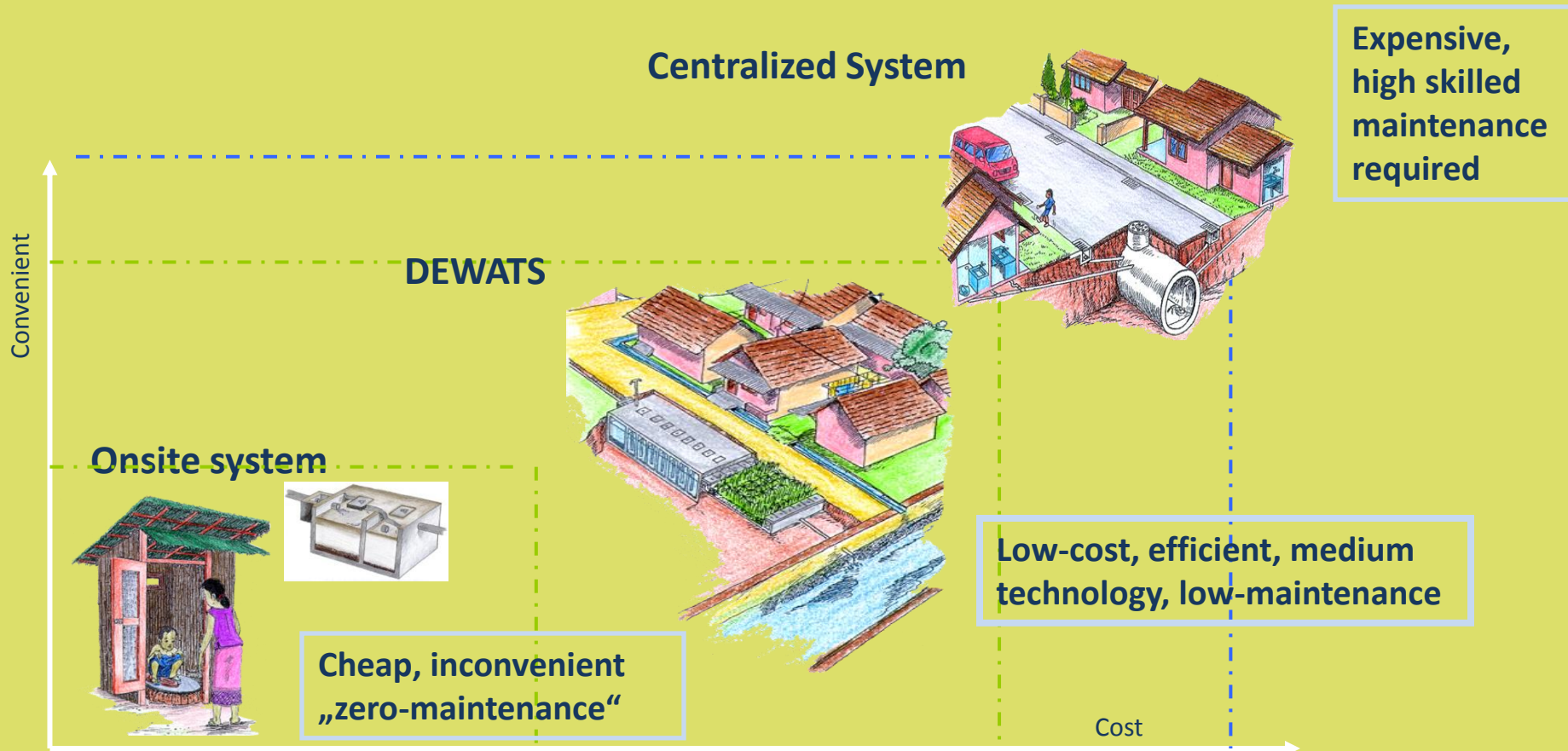
Anaerobic digestion



Aerobic and facultative decomposition



The 3rd option for Sanitation



Principles of DEWATS



Decentralized Waste Water Treatment Service Packages for non-toxic, organic wastewater are adapted especially for urban and peri-urban low-income areas where centralized sewer lines and WW-treatment works do not exist and where skilled personnel for operation & maintenance work is not available.

- ✓ *Keep it simple*
- ✓ *Quality Control*
- ✓ *Demand responsive approach*
- ✓ *Alignment with sector stakeholders*
- ✓ *Communities and clients become facility operators*
- ✓ *Franchise-like dissemination approach through expert network*



DEWATS O&M

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Practical Experiences



- **DEWATS is a *low maintenance* system:**
 1. No electricity needed
 2. No moving parts
 3. No skilled labour necessary
 4. Only basic O&M training needed
- **BUT: O&M is crucial!**



- **Periodical Maintenance**
 - Daily, Weekly or monthly Basis
 - Simple cleaning and scum removal
- **Annual Maintenance**
 - Desludging of Digester
 - Reparation of pipes and sewers
 - 2 – 3 year basis



O&M Experience

- **Complete O&M of 2 DEWATS in India**
 - Household Connection
 - Sewer systems
 - 64 × ABR compartments
 - 3 × Biogas Digester
 - 2 × Planted Gravel Filters
- O&M at *Beedi Workers Colony & Friends of Camphill*



Household connections

- **Possible O&M needs:**
 - Broken pipes
 - Tightness (use of glue)
 - Sufficient slope!



Sewer System





BORDA

Sewer System





Biogas Digester O&M





1. No underground sewer system
2. Limited access to open water bodies in Urban areas (Kabul)
3. Limited Masonry skills (30 yrs. of civil war)
4. Lower DEWATS efficiency during Winter!

- Danger of solids spill out
- Clogging of percolation bed
- Use of Effluent Filters



Vocational Training - AFG



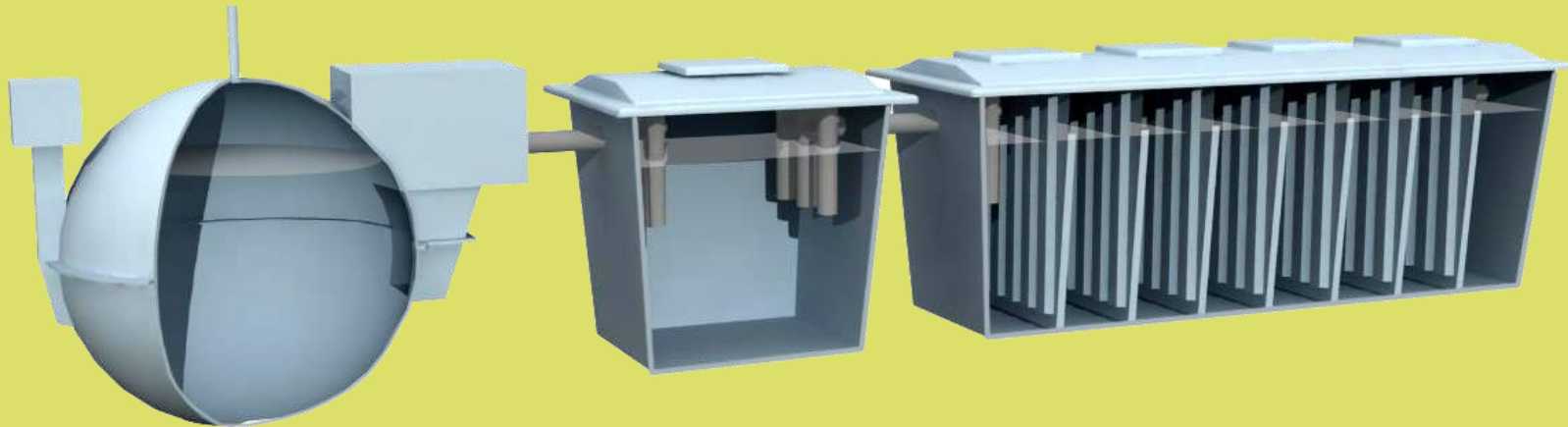
Prefab – O&M

- Prefabricated DEWATS
- Reinforced Fiber Plastic (RFP)



Prefab – O&M

- **Limited construction errors**
 - Prefabrication in factory
 - Easy & quick implementation on site (5 days)

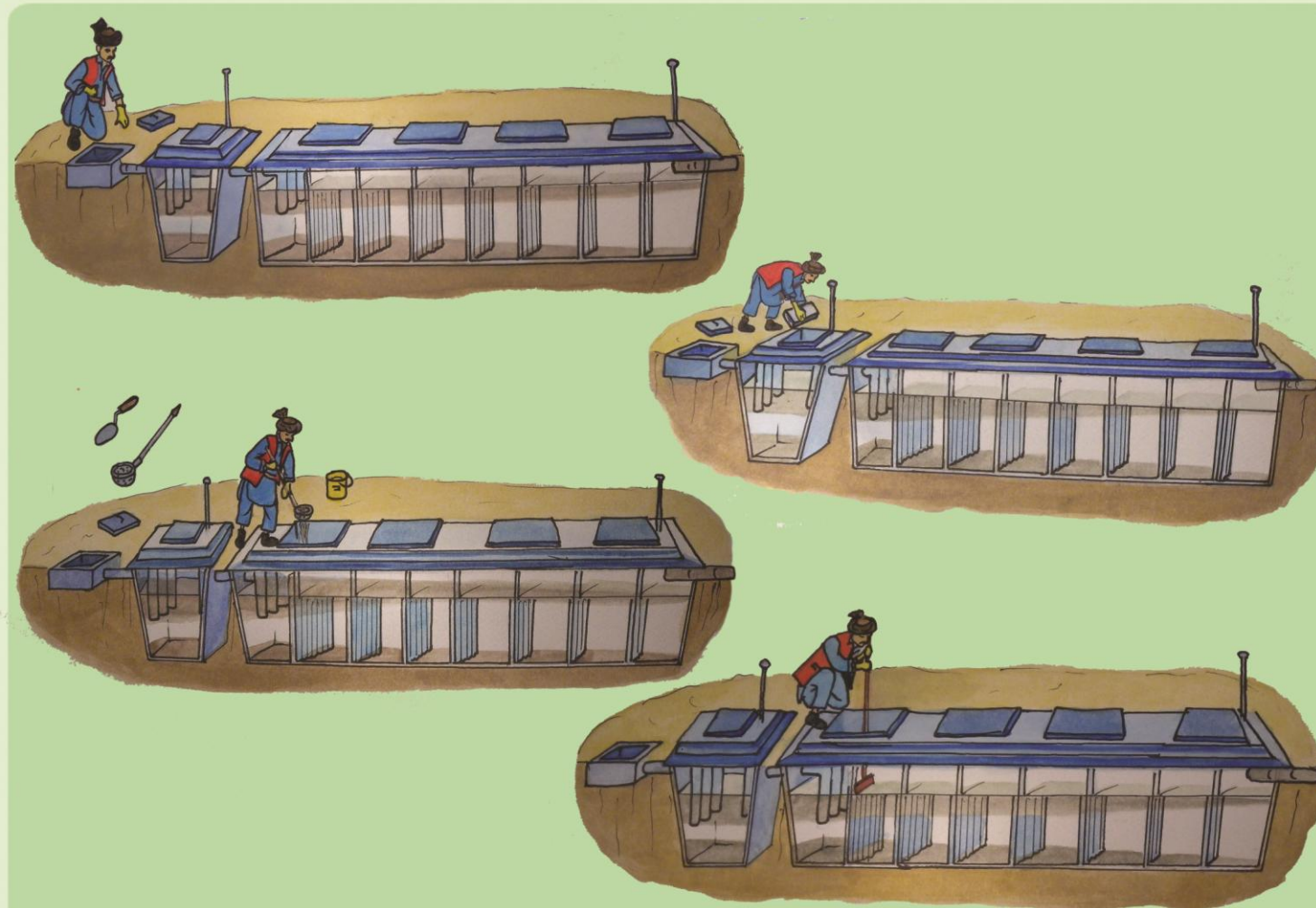




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Regular Prefab – O&M





Prefab – O&M



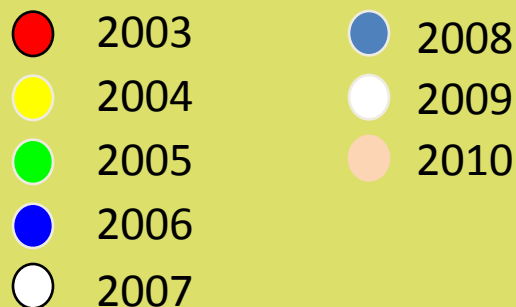
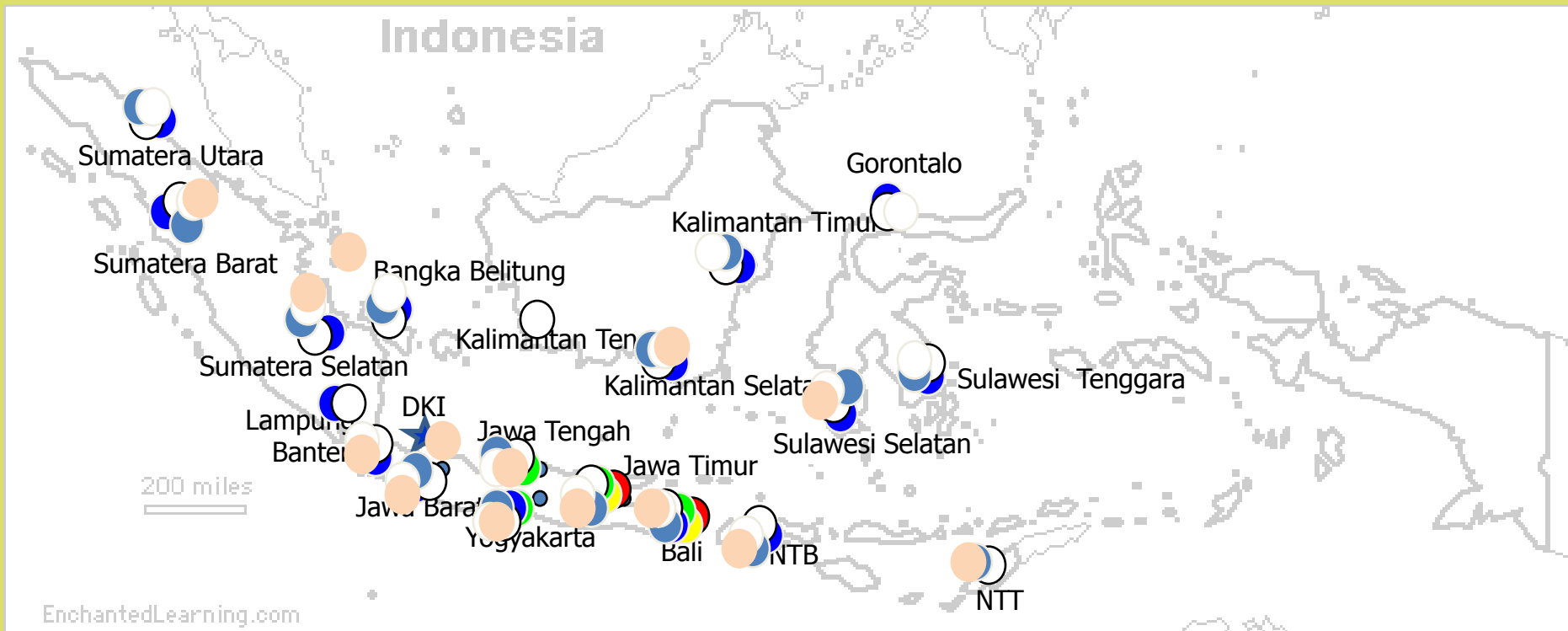
O&M Costs

Action	Remarks	USD / month
Desludging	50 USD per truck* 5 tracks in avg. / 2 years	10
Equipment	Buckets, shovels, plastic sheet 200 USD investment	8
Pipe reparation	Assumption 1: 10% of pinping length / 5 years 10 USD / m Assumption 2: Average of piping length = 500 m	4
O&M Operator	25 USD per maintenance * 4 time / month	100
	TOTAL COST	122

Upscaling DEWATS In Indonesia - Challenges and Options



SANIMAS Implementation in Indonesia



2003 – 2010:

- 25 Province

- 172 Cities/Municipalities

- 514 Locations

Sanitation Development Target Indonesia : “Open-defecation free by the end of 2014”

The government of Indonesia has been supporting and encouraging the acceleration of sanitation development through the ***Settlement Sanitation Development Acceleration Program (PPSP)*** with a high investment for 2010 - 2014 and the agenda to implement 1000 DEWATS projects per year in over 300 cities.

The figure of population served by DEWATS systems is already larger compared to population served by centralized systems in Indonesia and will increase exponentially until 2014.

Indonesia is one of the leading countries with such a high number of DEWATS – CBS

➤ A workable framework for long-term aftercare and financing for major maintenance is needed urgently to support the growing number of CBS and DEWATS.

How to ensure that CBO's have a network to:

- Exchange DEWATS CBS related issues
- Have access to DEWATS-CBS service providers
- Trouble shooting
- Monitor
- Lobby towards local governments in conducting major O&M issues jointly
- Develop ***regulatory framework*** jointly with governmental stakeholders



The first cars did not need traffic rules and a network of service stations...

How are decentralized systems managed after installation?

The Indonesian Association of Community Based Organizations on DEWATS (AKSANSI)



- ✓ Established by members of the first 120 CBO's operating DEWATS in Indonesia and since 2006 supported by BORDA
- ✓ Safeguarding the sustainable operation of 8000 upcoming DEWATS units in Indonesia

AKSANSI - supporting the sustainability of CBO's

Idea of AKSANSI: serving the networking of Community Based Organizations who are operating DEWATS systems

Objective of AKSANSI: To support the sustainability of community based decentralized sanitation:

- Activities which improve the performance and the lifetime of the DEWATS
- Extending towards projects on CBS not only from SANIMAS but also for well operating CBS systems from the other programs
- AKSANSI should become an interface between the CBO, the DEWATS CBS service providers and local governments as an “After-Sales-Service Provider”.



AKSANSI provides Services for CBO's and Local Governments in the fields of:

- Lobbying CBO towards stakeholders and policy makers
- Knowledge center (experts, documentations)
- Consultancy for CBO's technical/non technical
- Monitoring & Evaluation
- Communication of best practices to CBOs
- Communicating with CBO's and bridging CBO needs with local governments in case of further need for assistance
- ...



Outlook – Management Framework for DEWATS Projects



National and Provincial Government Level



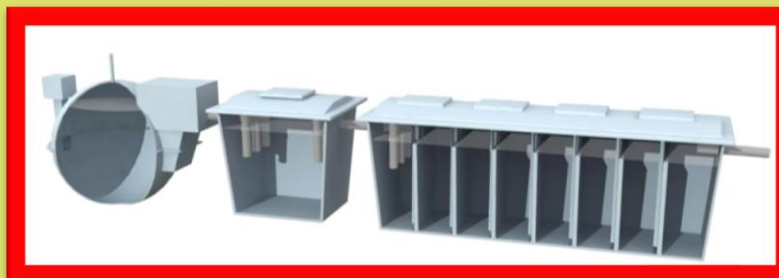
Municipality



Private Sector



Community/Institution/SME



Thank you very much!

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Discussion

- 1) What have been the main problems with O&M for decentralized systems in the past?
- 1) What are possible options for O&M management in areas with a large number of decentralized systems?
 - Would private sector involvement be a solution?
 - How feasible is a multi-stakeholder management approach in the context of up scaling?

Discussion

**How can the international community
contribute to up scaling and
sustainable O&M services
in developing countries?**