

Presentation from the

# Workshop on Innovations for Scaling up to Citywide Sanitation

October 16-17, 2012, Ahmedabad



Organised by PAS Project, CEPT University

# Decentralised Wastewater Management - Experience sharing -



**BORDA** Bremen Overseas Research  
and Development Association

[www.borda-net.org](http://www.borda-net.org)



Consortium for  
DEWATS  
Dissemination  
Society

[www.cddindia.org](http://www.cddindia.org)

Ahmedabad, 16.10.2012

## Content

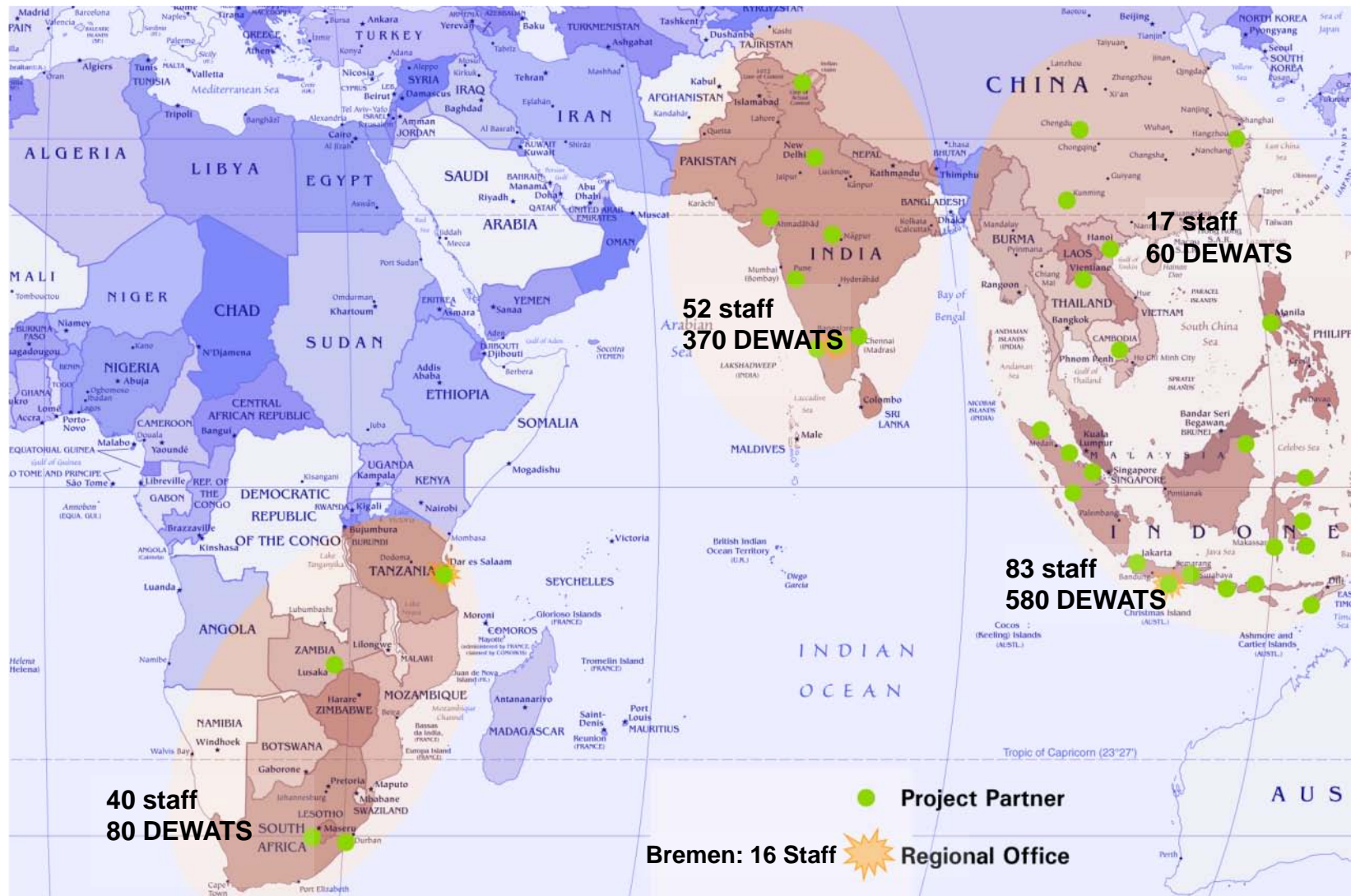
1. Who are we?
2. Thoughts
3. How did we get there?
4. Up scaling
5. Challenges and learnings

# 1. Who are we?

# BORDA – BNS Partner Network: 25 organisations from 3 continents



# BORDA – BNS Partner Network: 25 organisations from 3 continents



**Thoughts**

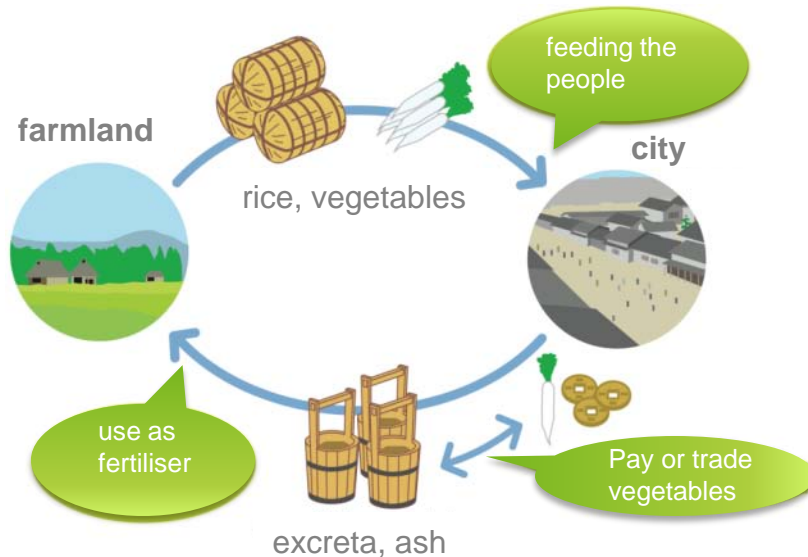
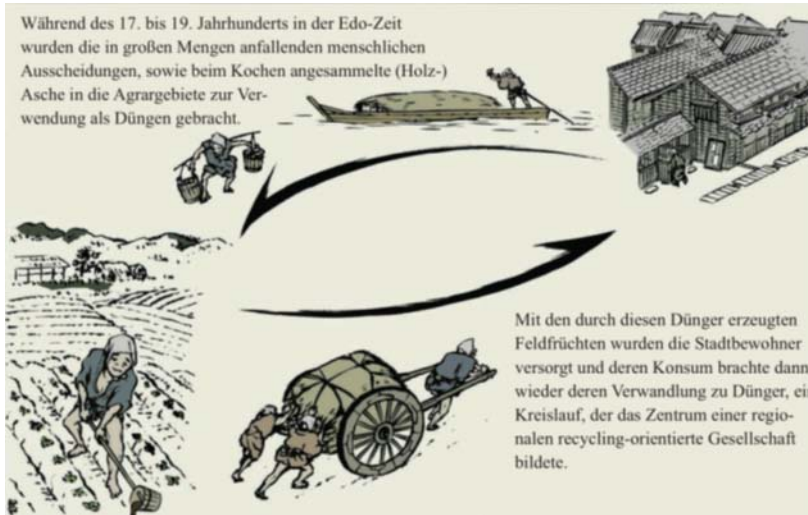
# The story from Edo and Rome

Anil Agarwal, CSE 2001



# Edo

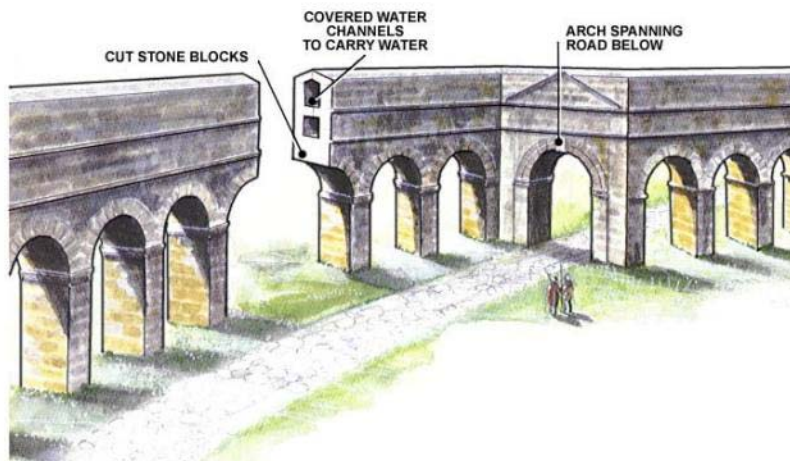
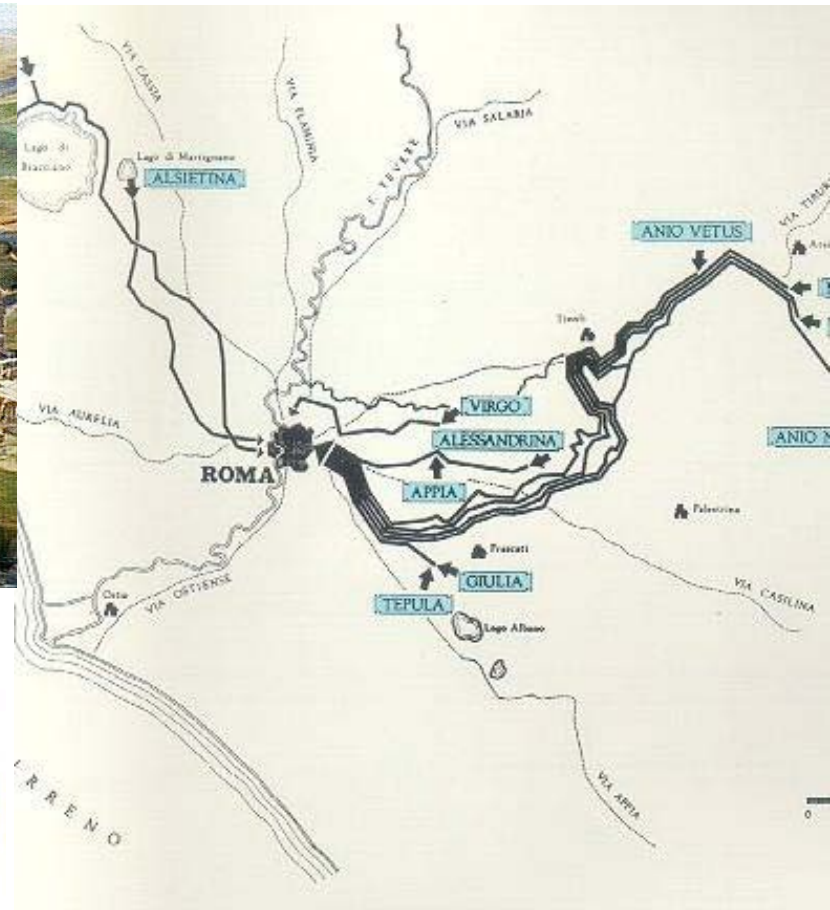
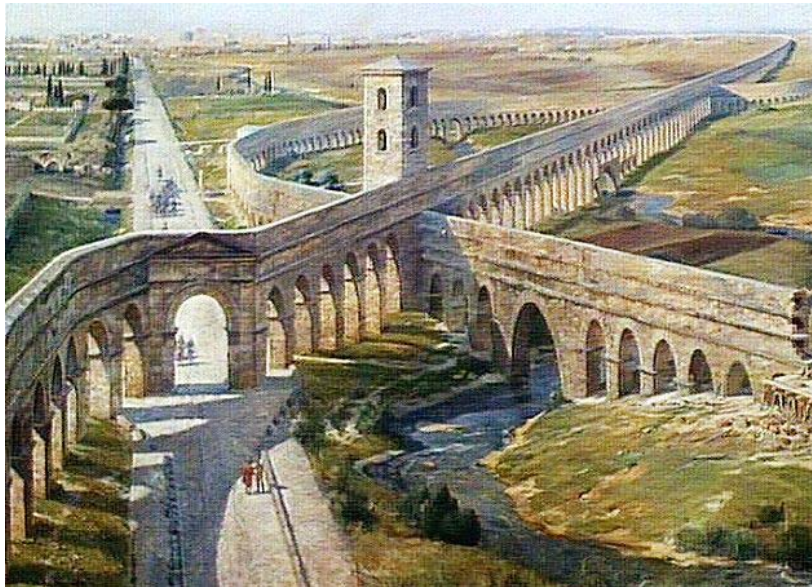
- Clean water supplied from the river and waste sold to farmers –
- Circular flow concept: for nutrients and water



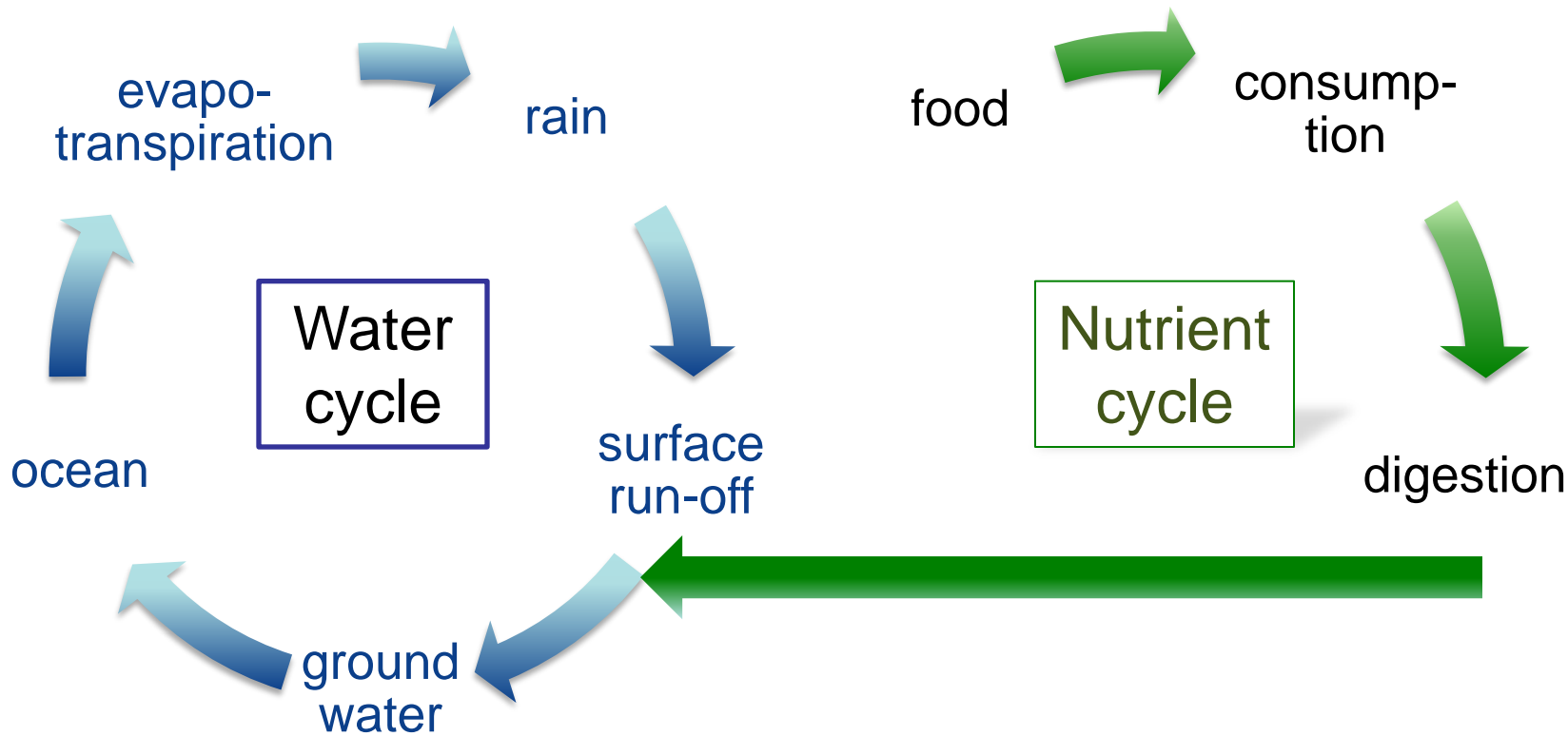


# Rome

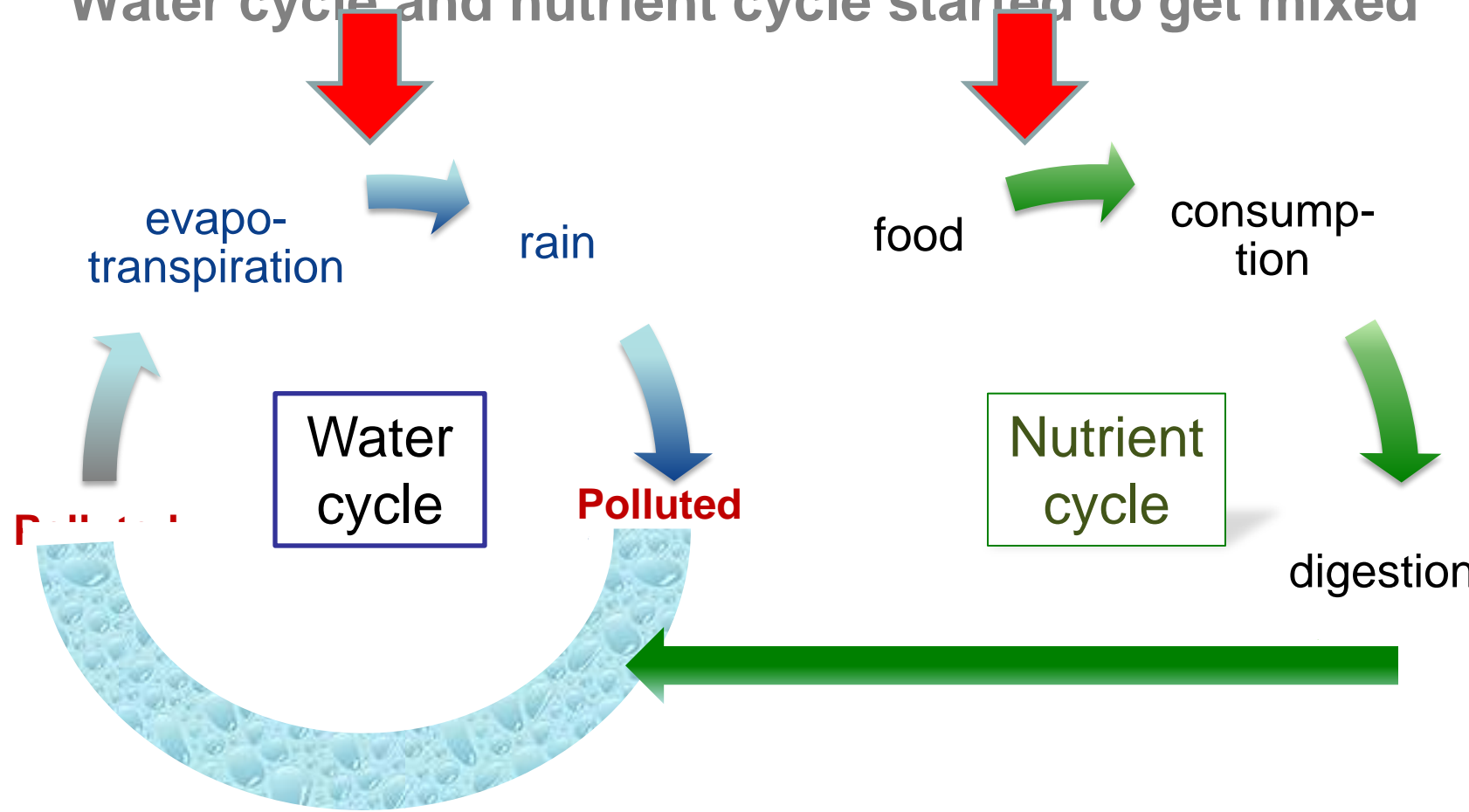
- *Excellent aqueducts, a symbol of stupidity?*  
*Introducing linear flow concept: clean input / use / waste output*



## Water cycle and nutrient cycle started to get mixed



**Water/Wastewater Treatment**  
**External Fertilizer**  
Water cycle and nutrient cycle started to get mixed



# Thoughts



**Poverty** leads to deterioration of environment and human health, when access to basic needs services is denied

# Thought



When central services fail to deliver, start at household level

There are solutions, but those in need don't have access to them



# Mission



## Facilitate

piloting & dissemination of  
**basic needs services**  
water, sanitation & energy  
in poor urban and peri-  
urban areas that can be  
**self-sustained**

## **3. How did we get there?**

A track record of 35 years





The Sino-Indo-German Biogas Knowledge Team 1978 in China





**Capacity Building**



**Expertise**



**Energy -Health**



**Sanitation-Fertiliser-Energy**

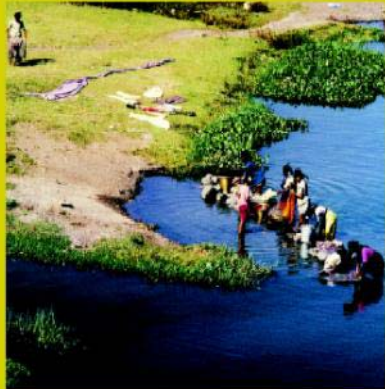



Community toilet solutions in the early 80s








# DEWATS


## Decentralised Wastewater Treatment in Developing Countries

Ludwig Sasse  
1998






1999/I/II No. 76/77
1994/I No. 56



# BIOGAS FORUM

- Pequeñas Plantas de Tratamiento de Aguas Residuales Domesticas (Aplicacion en Paisas Andinos)
- Possibilities of Increasing Biogas Production by using Different Mixtures of Animal Wastes
- Decentralised Waste Water Treatment Systems (DEWATS)
- The Readers Survey
- Evaluation of Biomethanation Potential of Selected Industrial Organic Effluents in India
- Biogas Users Survey 1998/99 in Nepal
- Remarks on Control Parameters for Decentralised Wastewater Treatment Plants (DEWATS)
- Community vs the Engineer

# BIOGAS FORUM

- Desired Future Structure of the Biogas Sector in Nepal
- Extension of Biogas in Nepal
- Electric Lighting through Biogas in Tribal Areas of India
- Purification Biogas Digester Treat Excrement and Sewage Hospital of Infectious Diseases
- Filtration Pit for Dewatering Biogas Plant Slurry in Hills
- Biogas Pressure Regulator



From Anaerobic Technology to DEWATS





Deteriorating water bodies in urban areas...Non functioning conventional STPs



Commission of the European Union  
 State Office for Development Co-operation - Bremen

# Status Report

on

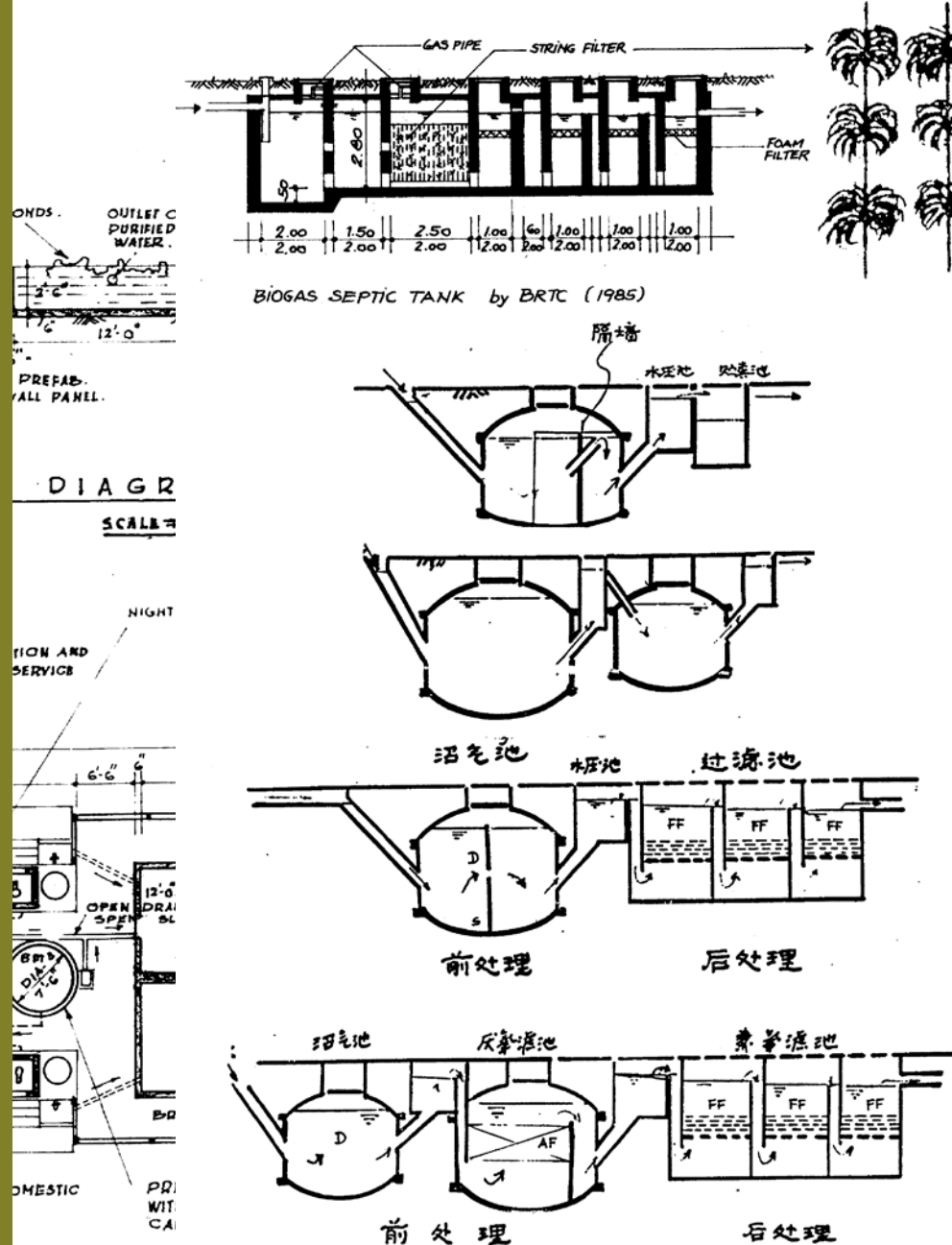
Decentralised  
 Low Maintenance Wastewater Treatment Systems

(LOMWATS)

Ludwig Sasse  
 Ralf Otterpohl  
 Bremen 1996



in Co-operation with  
 AFPRO, New Delhi; CEEIC, Chengdu; GERES, Marseilles;  
 HRIIEE, Hangzhou; SHTRAT, New Delhi



...leading to development of technical options based on existing designs...



...through applied research at lab-scale and real scale...

# Decentralised Wastewater Treatment Systems

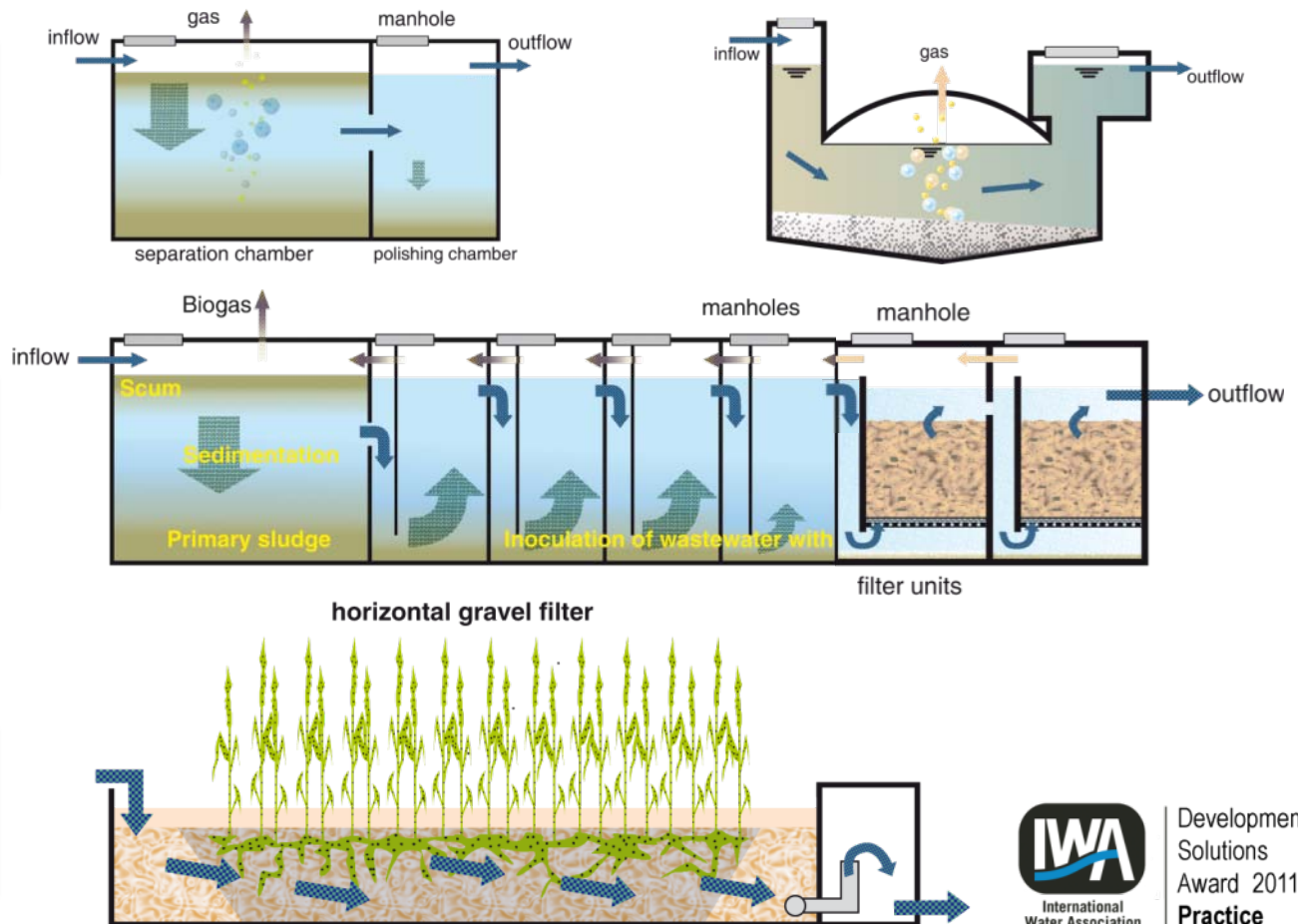
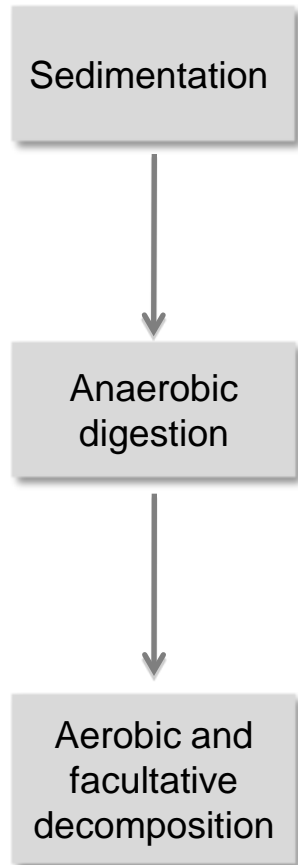
Concentration on decentralised application  
where qualified O&M cannot be expected

What will not be maintained,  
...does not need to be build



# Decentralised Wastewater Treatment Systems

*modular and standardized!*

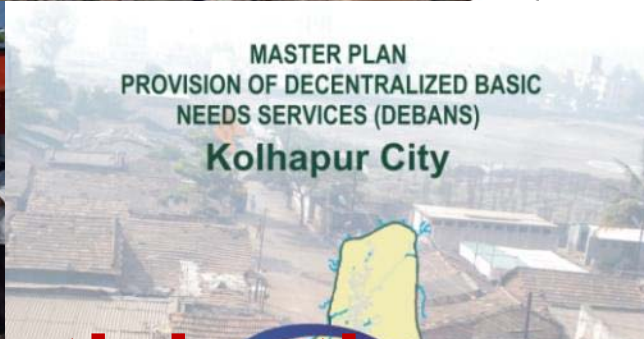




**CSP**  
**City wide DBNS**




**Community participation**



**MASTER PLAN  
PROVISION OF DECENTRALIZED BASIC  
NEEDS SERVICES (DEBANS)  
Kolhapur City**

**Sanitation  
from the Toilet  
to the River**

Prepared for  
KOLHAPUR MUNICIPAL CORPORATION (KMC)

Supported by  
BREMEN OVERSEAS RESEARCH & DEVELOPMENT ASSOCIATION (BORDA)

Prepared by  
CONSORTIUM FOR DEWATS DISSEMINATION (CDD) SOCIETY

In collaboration with  
CDD Network Partner  
ALCHEMY URBAN SYSTEMS PVT. L







**Toilets**



**Simplified sewer**



**Reuse of treatment products**



**Wastewater treatment**



**Sanitation  
from the Toilet  
to the River**

## Centralized system

- **Planning**
  - wastewater is collected from large parts of the city and
  - conveyed to a single location for treatment
- **Design**
  - Design for large areas and complex
  - System expansion requires lumpy investments
- **Construction**
  - Huge upfront investment (sewer lines, pumping stations, STP)
  - Large scale construction
- **O & M**
  - System failure affects the whole system
  - High operation and maintenance cost
  - Requires skilled manpower

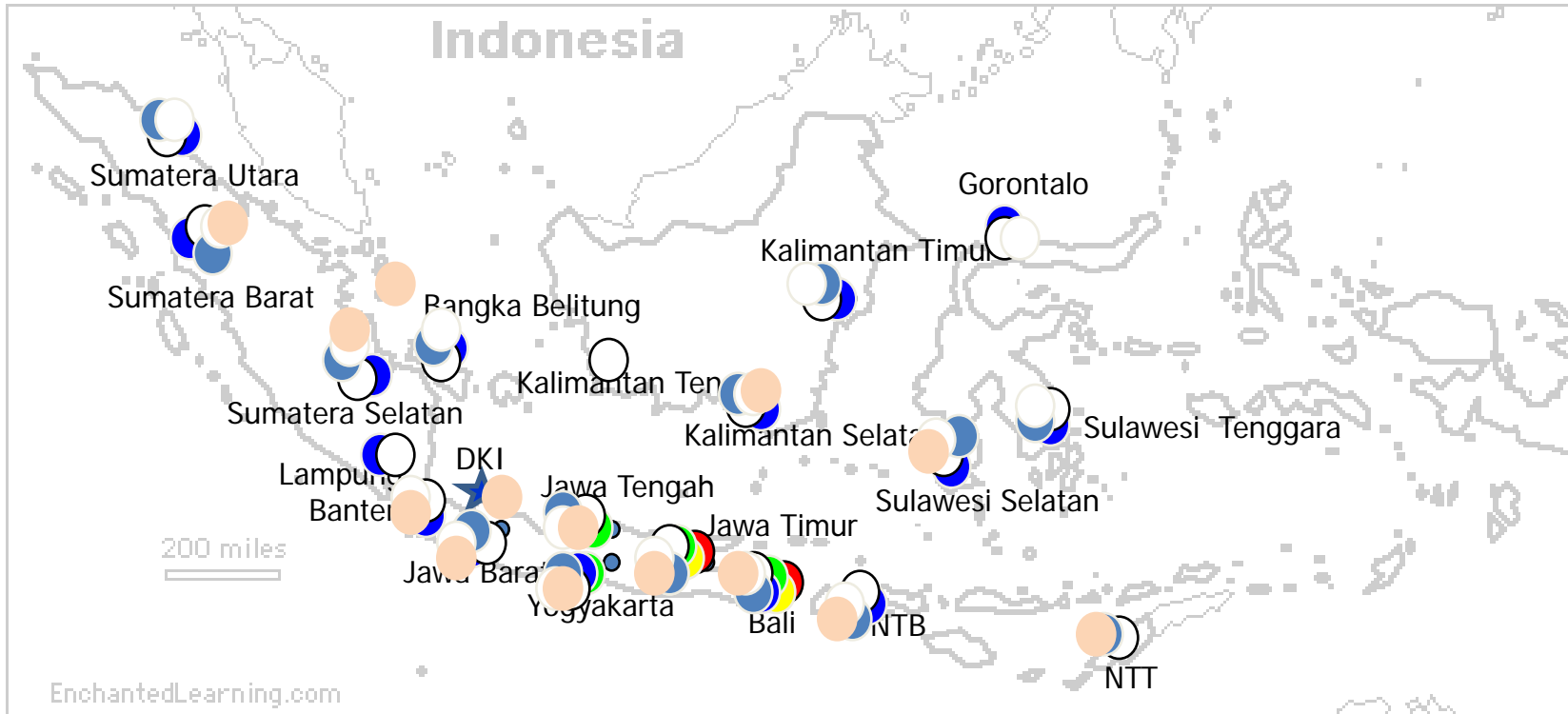
## Decentralized system

- **Planning**
  - wastewater is collected from a cluster
  - wastewater treated and disposed/reused near the source.
- **Design**
  - Design is for small area and simple.
  - Incremental modular expansion of system with small investment
- **Construction**
  - Initial investment flexible.
  - Total investment 50%.
- **O & M**
  - System failure affects only cluster
  - Low operation and maintenance cost
  - Doesn't require skilled manpower

## **4. Scope for DEWATS and upscaling**

# Example: upscaling in Indonesia

approach devel. with WSP/AusAid – upscaling with National + Local Government



- |        |                    |
|--------|--------------------|
| ● 2003 | ● 2008             |
| ● 2004 | ● 2009             |
| ● 2005 | ● 2010             |
| ● 2006 | 2011:              |
| ○ 2007 | training of        |
|        | 1,500 facilitators |

**2003 – 2010:**  
 - 25 Province  
 - 172 Cities/Municipalities  
 - 514 Locations

## **5. Challenges and learnings**

## Community Based Sanitation

### **(Survey of CBS DEWATS in Indonesia):**

- People like DEWATS
- Community manage daily operation
  - > above ground: yes
  - > below ground: difficult
- Shared responsibility with government is needed
- Effluent of DEWATS is good
  - > But desludging often not done in time
- Community Sanitation Center: fewer users than planed
  - > Bridge solution until Individual toilets arrive



## Community Based Sanitation

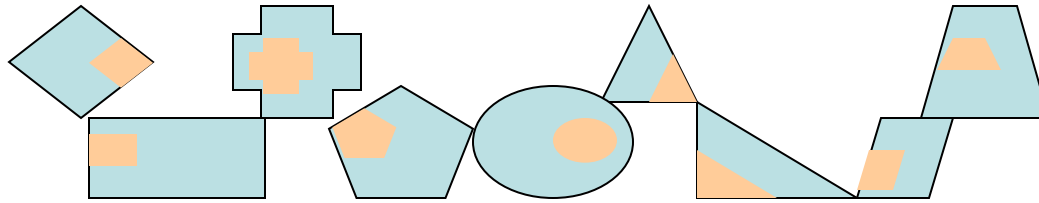
- Community managed structures need technical and non-technical support.
- SSS's cost efficiency is better (stable user numbers)
- Size matters -> cost and readiness for maintenance
  
- In India Government is not ready to pay for software
- Expectation that Gov will provide sanitation reduces self-help initiative.

## DEWATS - Part of City wide plans – Up-scaling

- DEWATS is the 3<sup>rd</sup> way, the option between pit latrines and Centralized systems.
- CBS DEWATS requires to be planned for as needed service.
- SME DEWATS is established; incentives to speed up.
- Differentiate between:
  - areas that will stay decentralized and
  - areas that will connect soon to central sewer

## Capacity Building

- The whole implementation chain requires to be trained



- Shift from Implementers to Knowledge Providers

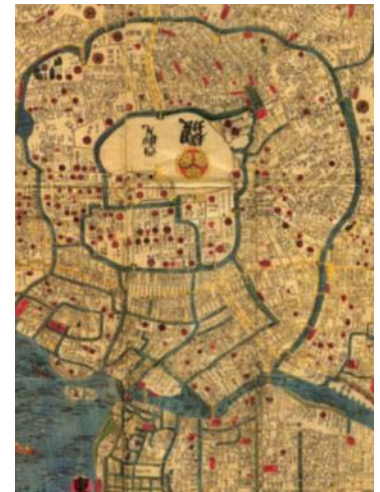
# Capacity Building

## *Centre for Advanced Sanitation Solutions (CASS)*





**Can/should we migrate from Rome to Edo?**  
**Can the nutrient cycle be closed again?**



# Thank you!

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