Presentation

Presentation from the 2009 World Water Week in Stockholm

Financial and Economic Analysis of Ecological Sanitation in Sub-Saharan Africa

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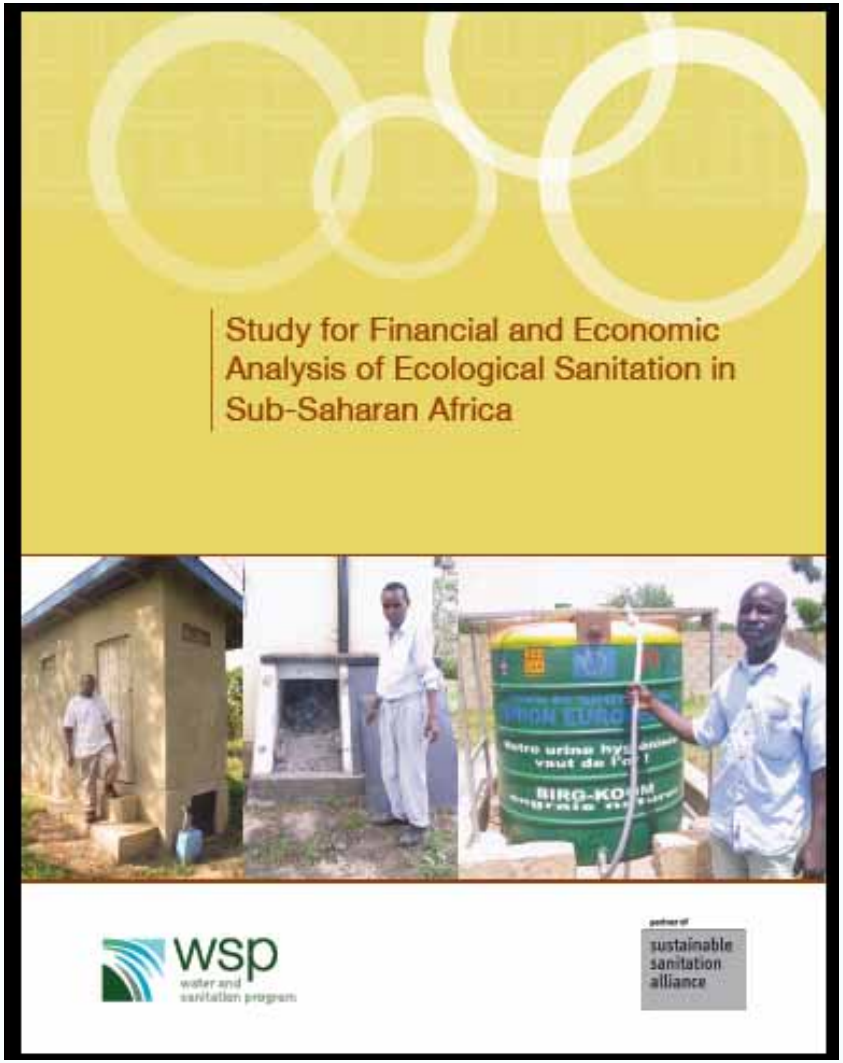
Outline

1. Aim and motivation of the study
2. Methodology and overview of the analytical model
3. Case studies
4. Findings
5. Way forward

Aim of the study

- To compare Ecological Sanitation (ecosan) with conventional sanitation systems in sub-Saharan Africa
- Comparison
  - in terms of economic and financial costs and benefits
  - between different sanitation technologies predominantly suitable for urban settlements
  - in/between countries



Motivation

1. **Increasing interest in the potential of ecosan**
   - **visible successes of small scale pilot projects**
   - **Convincing environmental reasons in support of ecosan approach**
2. **Increasing controversy about the viability of ecosan for the poor**
   - **Limited progress towards up-scaling ecosan pilots – reaching out to the unserved**
   - **Socio-cultural constraints relating to use of UDDTs, objections related to excreta reuse**
   - **High costs of ecosan (UDDTs)**

Methodology

- Formulation of analytical framework of financial and economic analysis
- Elaboration of a excel based model prototype
- Selection of case studies in South Africa, Uganda and Burkina Faso
- Data collection (stakeholder interviews and workshops), financial and economic analysis in 3 selected case study towns
- Fine tuning of working model based on further case study analysis
- Extensive peer review process during all stages

Study team

Economist and Team Leader: Richard Schuen

Sanitation Specialist: Jonathan Parkinson

Local Consultants:

- **for case study in Uganda: Victoria Abu Atukunda**
- **for case study in Burkina Faso: Linus Dagerskog**
- **for case study in South Africa: Melanie Wilkinson**

- **Valuable inputs from the World Bank sanitation team Guy Hutton, Eddy Perez, Pete Kolsky, Sam Mutono and Ousseynou Diop, Harriet Nattabi**

  from peer reviewers and SUSANA working group Arno Rosemarin, Martin Regelsberger , Elisabeth von Münch (GTZ, Germany), Barbara Evans, Cecilia Ruben, Elisabeth Kvarnström, Madeleine Fogde, Arne Panesar and Barry Jackson

Analyzed types of sanitation systems

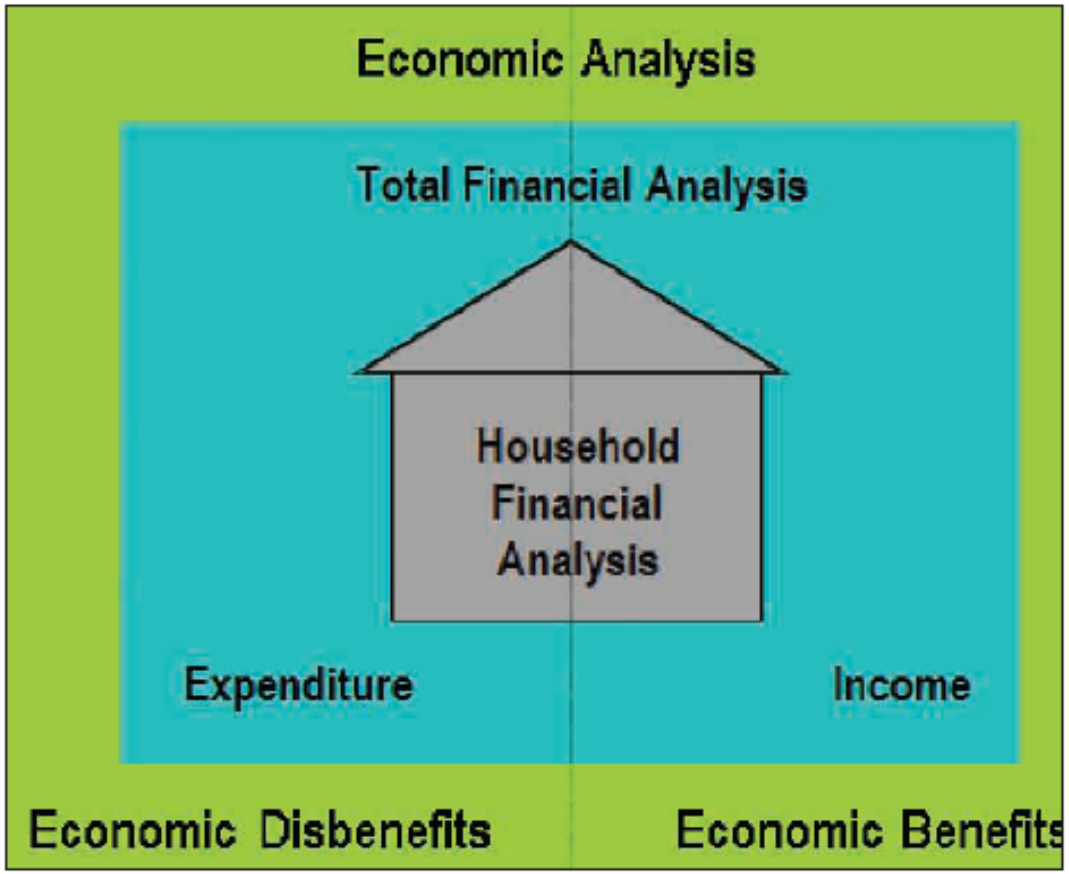
- **Conventional on-site sanitation: Traditional pit latrines & VIP**
  - **with/without desludging**
- **Conventional water born sanitation: Sewerage system**
  - **with/without wastewater treatment**
- **Ecosan household latrine (UDDTs in ALL cases)**
  - **with/without reuse**
- **Different design standards (low and high cost options):**
  - **Toilet designs ratified by government authorities ("high cost" options)**
  - **Additional low-cost alternatives (i.e. ecosan & traditional pit latrines)**

Overview of the model

The main parameter for comparison:

Net Present Value (NPV)

Levels of analysis:



Overview of the model

Characteristic	Financial analysis	Economic analysis
Capital and operating costs	Yes (financial transactions only, e.g. own labor is cost free)	Yes (all resource used, e.g. include opportunity cost of own labor)
Health benefits of improved sanitation	No	Yes; same for each of the three sanitation options (Hutton et al 2006)
Environment benefits, e.g. avoiding impact of discharge of untreated excreta into the environment	No	Yes; cost of remediation / treatment cost (Loetscher and Keller 1999)
Benefits associated with reuse	Yes, if produce sold or reduced expenditures (e.g. HH sells excreta to farmers, additional produce sold on the market)	Yes - monetized at market price (e.g. if produce is self-consumed to improve nutrition status)

Overview of the model

Characteristic	Financial analysis	Economic analysis
Costs of sewerage and wastewater / fecal sludge treatment	Yes HH perspective: e.g. sewerage charges Project perspective: full cost according to Loetscher and Keller (1999)	Yes (use cost of treating wastewater as proxy)
Subsidies	Yes	No (subsidies represent a 'transfer' rather than resource use).

Case study: eThekwini, Metropolitan area

- 74.000 UDDT installed
- 44.500 using conventional on site facilities
- Over 50,000 households connected to the sewerage network
- Reuse of excreta from UDDT is not promoted
- All sanitation options are heavily subsidized

Case study Ouagadougou, BF

- ECOSAN_UE operating in peri-urban areas of Ouagadougou; project start June 2006
- Approx. 800 ecosan toilets as of now (April 2009)
- Ca. 82,000 conventional on site facilities
- Ca. 200 connection to the sewerage network
- A mix of subsidies is applied in all sanitation options
- Communal ecosan service system promoted the ECOSAN_UE project

Case study
Kabale, Uganda

- Chief town of Kabale District in South-West Uganda, market town
- Estimated total inhabitants are 80,000
- Majority of the population is served by pit latrines
- Approximately 500 connections to the sewerage network in the centre
- Ca. 150 households using ecosan
- No subsidies applied

Study findings (1)

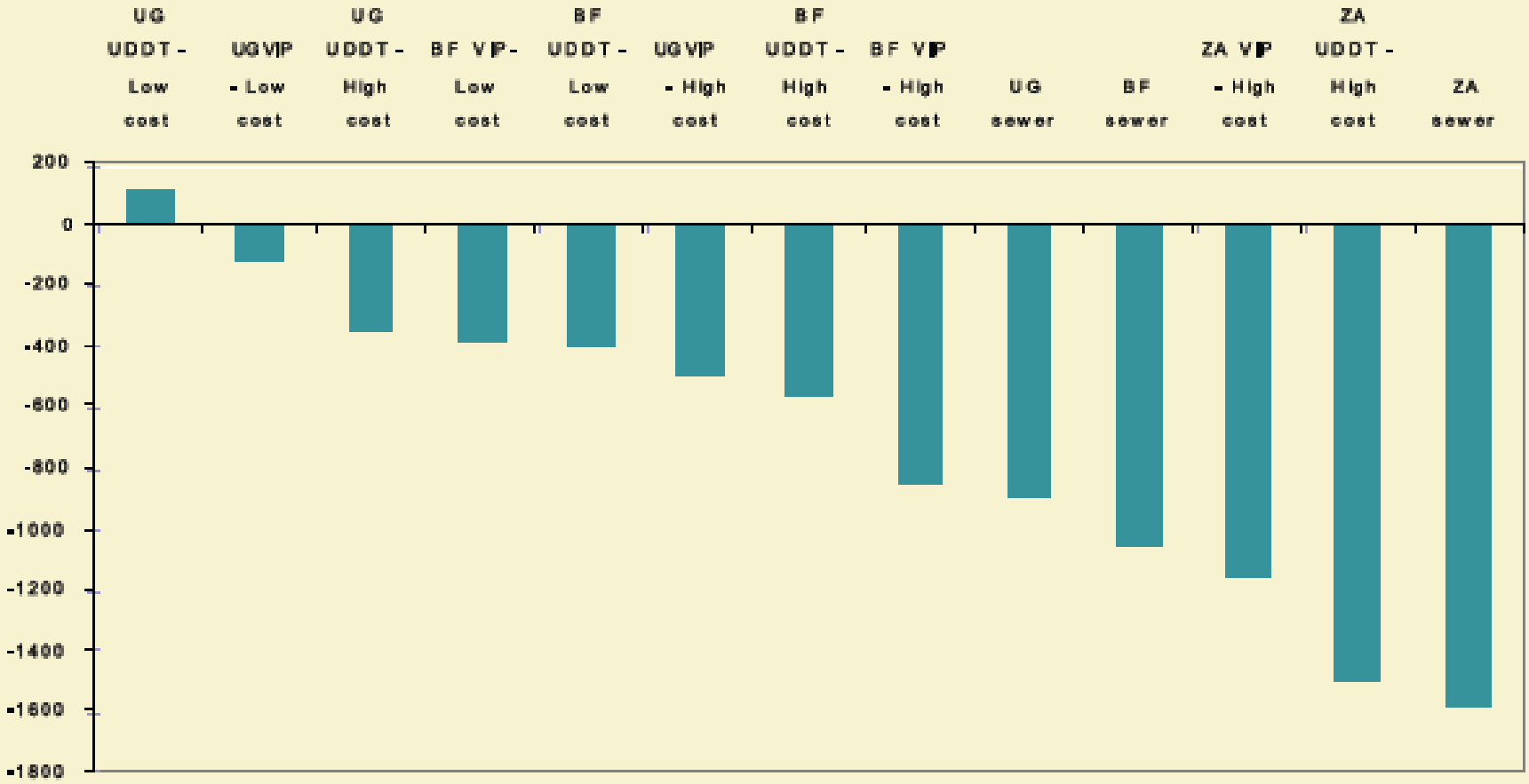
- Many examples of ecosan pilots and small-scale projects but very few urban projects at any scale.
- Even in towns that are well known for ecosan projects, coverage is by no means universal and only a fraction of households are involved in reuse.
- Ecosan toilets are only used by a relatively small number of the urban population
- eThekwini (South Africa) only larger scale case,, excreta reuse is not promoted and thus not an “ecosan” program as such

Study findings (2)

- **The results clearly indicate that UDDT and all other "ratified" and currently promoted may not be affordable for the poor without subsidies.**
  - **South Africa and Burkina Faso cases: Heavily subsidized household latrines and off-site excreta management.**
  - **Uganda: No subsidies but beneficiaries are middle and higher income households**
- **Subsidy levels can only be reduced if low cost latrines (i.e. CAPEX) are developed that are ratified and promoted by government agencies.**

Study findings (3)

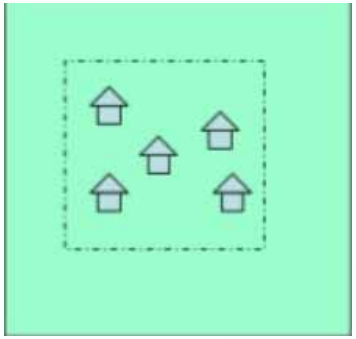
Figure 14: Cross – country comparison: Ranking of sanitation options – economic NPV

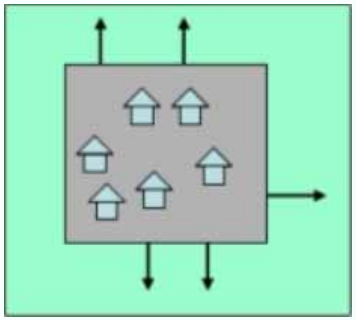


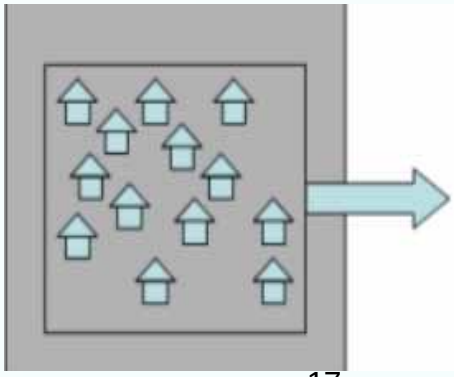
(UG – Uganda, BF – Burkina Faso, ZA – South Africa)

Study findings (4)

- **Reuse of excreta in the urban environment becomes increasingly less attractive as the housing density increases.**
- **Need to reuse excreta as close to the point of generation as possible**
- **Viable at scale models for communal collection without considerable external support (project, public) have not evolved yet.**







Way forward

This is just a beginning…..

- **Study provided first very valuable insights on issues of affordability in general**
- **Want to continue refining the model and cover more case studies incl. rural case studies (Ethiopia, Malawi)**
- **This work is part of WSP's ESI initiative in EA and Africa with 2 main work streams:**
  - **the "damage cost" of not doing sanitation**
  - **the "sanitation options study" - cost-benefit estimates of different types of interventions.**