Improving water supply and sanitation for the peri-urban poor in Africa

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Research on water and sanitation

During the year 2005-2006, students carried out research on water and sanitation in different countries.

- Phosphorus flow in slum area of Kibera, Nairobi Kenya (Koech)
- Water supply coverage in urban poor in Addis Ababa, Ethiopia (Bereket)
- Sustainable sanitation options in Lusaka, Zambia (Mayumbelo)
- Performance of water utilities in Mwanza, Tanzania (Maganga)
Peri-urban settlements

Informal settlements commonly referred to as squatter settlements or urban slums.

Characteristics of these settlements

- Un-planned housing structures
- Houses built using mud & corrugated iron sheets
- Low income
- Lack of, or minimal infrastructure
- Low water and sanitation coverage

They tend to be ignored in municipal planning.
Crowded settlements

Kibera slum in Nairobi- Kenya
Solid waste accumulation

Kibera - Kenya
Poor drainage

Lusaka- Zambia
Pit latrine

Kibera - Kenya
Long queues in search for water

Mwanza- Tanzania
Why the low coverage in water and sanitation?

Research has shown that low coverage is due to two main issues:

1. **Institutional issue**
   - Urban poor not given priority
   - Cost recovery imperative leads to their neglect
   - Inadequate budget allocation
   - Settlements are not formally recognised
2. Affordability

- Low income (less than 1 dollar per day)
- Daily water consumption is constrained
  - 20 l/cd (Addis Ababa)
  - 25 l/cd (Kibera, Nairobi)
- Water is mainly provided by
  - water vendors (using tanks & kiosks)

- Cost of water is not affordable
  - About US$ 1/ m³ (Addis Ababa)
  - About US $ 1.5/ m³ (Kibera)
Who are the service providers?

Small scale private providers

- Water kiosks owners
- Water tankers
- Latrine diggers and builders
- Waste disposal private providers
Small scale service providers

- Usually they are not recognized, have no access to loans, yet they provide essential services
- Private providers should be recognized as a resource rather than a problem
- But local authorities should regulate their actions
Sanitation

In order to address the sanitation problems in these areas, a number of factors needs to be considered:

- Appropriate and sustainable sanitation options should be explored
- Options should not be based on cost of hardware only
- Users should be involved in selection of the options
Waste reuse activities in Kibera

- Waste water is diverted to gardens
- Composting of organic materials
- Paper & bottle re-cycling
- Grey water used for washing of cars

Organic Compost in Nairobi - Kenya
Problems caused by poor sanitation

- Water borne diseases such as dysentery, cholera
- Environmental deterioration such as ground water pollution, eutrophication of rivers leading to water hyacinth invasion

Water hyacinth in Nairobi dam (Kenya)
Phosphorus mass balance in Kibera slum-Kenya (tons/capita yr)

IN 

Household 

OUT 

- Detergents = 5
- Food & Beverages = 81

Total = 86

- Urine = 49
- Faeces = 16
- Grey water = 5
- Solid waste = 6

Total = 76
76 tons/year P

200,000 people

Closing The loop

Feed 80,000 people

8000 tons/year

Road to MDG GOAL 1
Benefits of waste reuse

- Prevent environmental disasters
- Reduce waterborne diseases
- Improve hygiene standards
- Improve on soil nutrients
- Improve on yields
Fourth world is growing! Investing in peri-urban development with holistic problem analysis can bring multiple benefits!

THANK YOU