Resource Recovery and Reuse for sustainable sanitation service delivery: The need for Business Models

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The Challenge we face

• POOR SANITATION COST THE WORLD US$222.9 BILLION IN 2015

= 0.9% global GDP or more than 50 times the cost of the Rio Olympics

LIXIL, WaterAid, Oxford Economics, 2016
• Across the developing world, around 10% of wastewater gets treated.

• In India, 80% of all water pollution has been associated with poor fecal sludge management.

• There are hardly any treatment plants for the more than **100 million** septic tanks and pit latrines in the country.

• Incentives are needed to get private sector interest in investing in the sanitation service chain.
Wastewater and faecal sludge treatment plants in Ghana

Operational Status

How many of them work?

Recovering water, energy and nutrients from solid and liquid waste streams for reuse offers a triple value proposition:

1. Opportunities for a circular economy, e.g. nutrient reuse in agriculture;
2. Revenue or cost savings to attract private sector participation or support other parts of the sanitation service chain;
3. Less environmental pollution.
Challenges for business development in RRR sector

• Most RRR initiatives in low-income countries characterized by:
  - High dependence on **subsidies**;
  - **Limited up-scaling** potential.

• Challenges:
  - **Access to financing** – lack of local capital markets, liquidity concerns, low credit worthiness, external factors introduce lending risk;
  - Gaps in **business thinking/ models** and market-driven mechanisms that represent:
    a. sources of revenue generation, social benefits
    b. incentives for private sector participation.
Our approach

- Implementation recommendations and capacity development
- Feasibility studies and model verification
- Business model analysis
- Business data collection
From analysis to implementation (2012-2020)

- 180 RRR cases screened
- 60+ cases had in-depth analysis
- 24 business models extracted/developed (+18 models only for FSM)
- Model feasibility tested in 15 cities/towns
- 4 models are under implementation as PPP with our facilitation
Partially subsidized composting at district level

- **Scale:** 10 – 75 T of MSW/day;
- High environmental and social impact;
- Strong govt support via waste segregation/tax;
- Potential to transition into full-cost recovery and even profit-making under PPP agreements, CDM.
Fecal sludge-based fertilizer for revenue generation

- Scale: 60–100T MSW/day, 50-60 m³ FS/day;
- High profitability due to multiple-revenue stream approach;
- Operational cost breakeven in 3-5 years;
- Success drivers: economies of scale, strategic partnerships, product innovation, potential for market segmentation;
- Employment generation for urban poor, including women.
**FSM Business Models**

- 18 FSM Business Models developed
Social enterprises in waste-based energy production

- **Scale**: Small (<300T/ year) and medium (300–1,500 T/year);
- **Organization type**: Private or cooperative, PPP;
- **High replication potential**: no sophisticated financing and technology requirements;
- **Strategic partnership** with municipality for waste collection and management;
- **Beneficial to women and children** using fuel with less indoor air pollution than firewood; time savings for girls in fuel collection.
Recent publications:

Resource Recovery & Reuse series:

www.iwmi.cgiar.org/publications/resource-recovery-reuse/
IWMI’s on-going work

RESOURCE RECOVERY FROM WASTE
Business Models for Energy, Nutrient and Water Reuse in Low- and Middle-income Countries
Edited by Miriam Otoo and Pay Drechsler
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BUSINESS CURRICULA
for business and engineering schools

for investors and practitioners
Current & Planned Geographical Focus Areas

**West Africa:**
- Technology development
- Out-scaling RRR implementation

**East Africa/MENA:**
- RRR innovation in refugee settlements;
- Financing mechanisms for RRR uptake;
- Investment climate analysis
- Development and pilot of DSS tool for investors.

**South/SE Asia:**
- Feasibility assessments of RRR models;
- Implementation support, advisory services;
- Capacity development – business incubators;
- Food waste management across scales