FSM of semi-centralised sanitation projects in Zambia

Jackson Mulenga (DTF)* & Steffen Blume (GIZ)**

* Devolution Trust Fund, Plot 164, Mulombwa Close, Fairview, P.O. Box 34358, 10101, Lusaka, Zambia Tel: +260 211 230619; Fax: +260 211 233032; email: jmulenga@dtf.org.zm
**GIZ, Water Reform Programme; Plot No. 6469 Kariba Road, Kalundu, Private Bag RW 37X, Lusaka, Zambia Tel: +260 974 775055; Fax:+260 211 233032; email: steffen.blume@giz.de
• 57% of urban Zambians have sanitation (sewer or septic tanks)
• 90% of people in peri-urban areas (1,27 mio) use pit latrines
• Pro-poor basket funding instrument
• DTF assists CUs to provide sustainable WSS service provision to the urban poor
Sanitation principles

Concept

- Demand Responsive
- Household level sanitation
- Ownership by Commercial Utilities
General sanitation concept

Sanitation fee (40% of water bill)

Household wastewater

Biogas digester

Gas outlet

ABR

Planted Gravel Filter

Storage for irrigation water or intake into river

Drying bed

Reuse Banana plantation, in Kandundu flower gardening in Libuyu

Revenue from sell of human manure

Commercial Utility

Source: adopted from Chris Kellner
Project sites

Solwezi, Kandundu project

Mufulira, Kansuswa project

Ndola, Kariba project

Livingstone, Libuyu project

Source map: CIA factbook
# Project overview

<table>
<thead>
<tr>
<th>Project</th>
<th>Town</th>
<th>CU</th>
<th>No of users</th>
<th>Annual FS (m³)</th>
<th>WW Treatment system</th>
<th>FSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kandundu</td>
<td>Solwezi</td>
<td>NWW SC</td>
<td>1,000</td>
<td>60</td>
<td>2 Biogas Digesters (BgD), ABR and PGF</td>
<td>Emptying BgD (1-2 years), sludge drying, reuse locally</td>
</tr>
<tr>
<td>Kansuswa</td>
<td>Mufulira</td>
<td>MWSC</td>
<td>10,500</td>
<td>630</td>
<td>Stabilization pond system</td>
<td>Pond desludging</td>
</tr>
<tr>
<td>Kariba</td>
<td>Ndola</td>
<td>KWSC</td>
<td>2,000</td>
<td>120</td>
<td>2 biogas digesters, conventional system (trickling filter)</td>
<td>Emptying BgD (1-2 years), sludge drying</td>
</tr>
<tr>
<td>Libuyu</td>
<td>Livingston e</td>
<td>SWSC</td>
<td>2,800</td>
<td>170</td>
<td>9 biogas digesters, pond system</td>
<td>Emptying BgD (1-2 years), sludge drying, reuse locally</td>
</tr>
</tbody>
</table>
Libuyu project, Livingstone
Kandundu project, Solwezi
Project impressions

Pre-fabs in Ndola

Pre-fabs in Livingstone

Biogas construction training 2009
## Project costs

### DTF sanitation costs (per cap in USD)

<table>
<thead>
<tr>
<th></th>
<th>Libuyu</th>
<th>Kariba</th>
<th>Kandundu</th>
<th>Kansuswa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative budget</td>
<td>13</td>
<td>21</td>
<td>42</td>
<td>7</td>
</tr>
<tr>
<td>Total cost for pumphouse and/or treatment facility</td>
<td>72</td>
<td>6</td>
<td>216</td>
<td>17</td>
</tr>
<tr>
<td>Total costs for network (p.p)</td>
<td>72</td>
<td>98</td>
<td>77</td>
<td>76</td>
</tr>
<tr>
<td>Total cost for toilets</td>
<td>174</td>
<td>239</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graph:

- **Libuyu**
  - Administrative budget: 13 USD
  - Total cost for pumphouse and/or treatment facility: 72 USD
  - Total costs for network (p.p): 72 USD
  - Total cost for toilets: 174 USD

- **Kariba**
  - Administrative budget: 21 USD
  - Total cost for pumphouse and/or treatment facility: 6 USD
  - Total costs for network (p.p): 98 USD
  - Total cost for toilets: 239 USD

- **Kandundu**
  - Administrative budget: 42 USD
  - Total cost for pumphouse and/or treatment facility: 216 USD
  - Total costs for network (p.p): 77 USD
  - Total cost for toilets: 239 USD

- **Kansuswa**
  - Administrative budget: 7 USD
  - Total cost for pumphouse and/or treatment facility: 17 USD
  - Total costs for network (p.p): 76 USD
  - Total cost for toilets: 76 USD
# Estimated OPEX

## Annual OPEX per person in ZMK

<table>
<thead>
<tr>
<th>Annual OPEX in ZMK</th>
<th>Total</th>
<th>Per household</th>
<th>per person</th>
<th>per m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kandundu</td>
<td>30,707,358</td>
<td>289,692</td>
<td>48,000</td>
<td>805</td>
</tr>
<tr>
<td>Kansuswa</td>
<td>160,987,241</td>
<td>94,698</td>
<td>15,869</td>
<td>395</td>
</tr>
<tr>
<td>Kariba</td>
<td>61,126,409</td>
<td>174,647</td>
<td>29,000</td>
<td>416</td>
</tr>
<tr>
<td>Libuyu</td>
<td>99,900,377</td>
<td>256,155</td>
<td>42,000</td>
<td>1,525</td>
</tr>
</tbody>
</table>

1USD = 5300 ZMK
Challenges

• Little commercial orientation to Sanitation
• Old mindset of peri-urban areas as not commercially viable
• Management of FS handling by the community vs. CU
• Addressing full sanitation chain costs money!
Thank you!
ANNEX
Zambian sector

Source: NWASCO strategic plan 2010-2012
Stakeholders

- **DTF** – Devolution Trust Fund: To assist and to finance the CUs to improve service delivery particularly in low income population in peri urban and low cost areas of Zambia

- **CU** – Commercial Utility: To provide and implement WSS to the community

- **WASAZA BORDA** – NGO working in sanitation: To provide capacity and technical expertise for implementation of the project

- **ComSamCom** – Community based organisation: represent the community in the decision making process and collect community contribution
Implementation Mechanism

**CU**
- Financing Agreement & Contract
- Intermittent Monitoring
- Verification of Data in Proposal
- Verification of Works/Supplies

**Contractor**
- Supervision of Works

**Technical Consultant & Project Team**
- Assistance in Training, Health & Hygiene Promotion
- Setting up Facility Management System
- Training and Capacity Building Assistance in Implementation

**Social Consultant & Project Team**

**Mutual Cooperation**

WASAZA, BORDA
Devolution Trust Fund

- Pro-poor basket funding instrument
- DTF assists CUs to provide sustainable service provision to the urban poor

NWASCO Council

DTF Committee

- Director Nwasco
- Secretary
- DTF Manager
- WSS Engineer
- Socio-Economist
- Accountant