Market Demand Study for end-products of Faecal sludge Treatment in Kampala, Accra and Dakar

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INTRODUCTION

• Sanitation systems in SSA are characterized by:
  ➢ poorly maintained on-site sanitation systems
  ➢ dysfunctional FS collection and transport, and
  ➢ disposal of untreated FS directly into the environment.

• The situation needs to be improved through treatment and valorization of FS.

• For valorization of FS to work, there is need to know existing and potential markets of FS end-products.
OBJECTIVES

• To Identify existing end-uses and end-users of FS products in Kampala, Accra and Dakar.

• To identify innovative enduses, and potential endusers for FS products

• To develop a comprehensive understanding of the market demand for FS in the three cities.
<table>
<thead>
<tr>
<th>CITY</th>
<th>FS MANAGEMENT STATUS</th>
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</thead>
</table>
| Dakar, the capital of Senegal | • 2.5 million residents  
• ~25% connected to sewers  
• 1 million m\(^3\) of FS per year, ~20% collected and treated |
| Accra, the capital of Ghana  | • 3.91 million residents  
• ~15% connected to sewers  
• No FS treatment  
• ~273,750 m\(^3\) FS collected and discharged officially per year |
| Kampala, the capital of Uganda | • 1.72 million residents  
• ~7% connected to sewers  
• ~73,000 m\(^3\) of FS per year is collected and treated |
<table>
<thead>
<tr>
<th>Designated use of FS</th>
<th>Products to be replaced by FS</th>
<th>Stakeholders</th>
<th>Interviews conducted</th>
</tr>
</thead>
</table>
| Dried FS as fuel in Industries | • Solid fuel (wood, coal, etc.)  
  • Liquid fuel  
  • Electricity | • Clay/ Brick industries.  
  • Cement plants  
  • Blacksmiths  
  • Industrial boilers | Dakar: 34  
  Accra: 6  
  Kampala: 16 |
| Dried FS as fertilizer      | • Chemical fertilizer  
  • Organic manure  
  • Sewage sludge | • Urban farmers  
  • Horticulturists  
  • Landscapers | Dakar: 34  
  Accra: 82  
  Kampala: 50 |
| FS as feedstock in biogas plants | • Firewood  
  • Electricity  
  • LPG | • Households  
  • Schools  
  • Public markets | Dakar: 5  
  Accra: -  
  Kampala: 3 |
| FS as a constituent in clay bricks | • Clay | • Clay industries | Dakar: -  
  Accra: -  
  Kampala: 3 |
| FS as protein source in animal feeds | • Fish meal  
  • Small dried fish | • Poultry farmers  
  • Fish farmers  
  • Animal feed industry | Dakar: 2  
  Accra: -  
  Kampala: 7 |
METHODOLOGY

• Open-ended, semi-structured interviews
• Spontaneous enquiries and visits to relevant enterprises.

Interviewing a farmer in Accra
1. Dried FS as Industrial Fuel

Type of industrial fuel usage by city

This is specific to industries sampled. In Kampala, sampling was purposive where industries using electricity were excluded.
Industrial fuel - Kampala

There is an existing market in Kampala for alternative types of solid fuels

Firewood, charcoal, saw dust, husks, old paper money.
Industrial fuel – Kampala

Examples of industrial boilers and kilns

- Burner
- Burner
- Drought Kiln
- Blacksmith
- Hoffman kiln
- Diesel burner
Market should be easily adaptable to FS

FS can be used without changing heating and feeding mechanism of boilers.

Most promising were blacksmiths and clay industries.

Blacksmiths and clay industries prefer briquette and crumbly form
Industrial fuel – Dakar and Accra

Changing liquid fuel or electrical powered kilns or boilers to solid fuel such as FS, may require complete change of heating mechanism

Will be important to demonstrate feasibility

Plans for a pilot implementation currently underway in Dakar

Other concerns of stakeholders included risk of bad odors when burning, or disease transmission when handled
## 2. Biogas

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar</td>
<td>FS from septic tanks, not as much gas potential</td>
</tr>
<tr>
<td>Accra</td>
<td>FS from latrines and public toilets, higher gas potential, Some existing implementations</td>
</tr>
<tr>
<td>Kampala</td>
<td>FS from public toilets, higher gas potential, Biogas commonly used at community level.</td>
</tr>
</tbody>
</table>

There is a need to investigate into a reasonable consumer pattern for produced gas.
3. Production of Protein for Animal Feed

Use of FS as feed source for fly larvae.

These could replace fishmeal, small fish in poultry feeds.
Prepared poultry feed costs 0.5 USD / kg, with fish meal as protein source.

Use of BSF larvae could reduce the cost to USD 0.4/kg.

In Dakar feed is purchased commercially, in Kampala it is frequently prepared by farmers.

In Kampala, 25% of farmers were willing to directly switch over to FS if the price was competitive.

Transition would require outreach / education.
4. Building materials

• It is not currently used for this purpose in any of the 3 cities.

• Interviews were carried out in Kampala, where brick manufacturing is pervasive.

Representatives from the factories had a negative perception based on quality standards, abundance of natural resources, and health risks

=> in brick manufacturing in Kampala, higher demand for use of FS as fuel, than building material component
5. Soil conditioner

Fertilizers currently being used

**Chemical**

- [Image of DAP fertilizer]

**Sewage sludge/FS**

- [Image of a truck with sewage sludge]

**Animal manure**

- [Image of animal manure]

**Crop remains**

- [Image of crop remains]

**Household waste**

- [Image of household waste]
Soil conditioner

<table>
<thead>
<tr>
<th>Location</th>
<th>Practices and Costs</th>
<th>Use Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar</td>
<td>• Use FS mixed with animal manure and leaves.</td>
<td>• Dried FS cost USD 4 per tonne</td>
</tr>
<tr>
<td>Accra</td>
<td>• FS is commonly used by farmers.</td>
<td>• FS is commonly used by farmers.</td>
</tr>
<tr>
<td></td>
<td>• Most farmers use organic wastes at no cost.</td>
<td>• Most farmers use organic wastes at no cost.</td>
</tr>
<tr>
<td></td>
<td>• Farmers are open to using FS.</td>
<td>• Farmers are open to using FS.</td>
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<tr>
<td>Kampala</td>
<td>• Use sewage sludge, USD 10 per tonne</td>
<td>• Use sewage sludge, USD 10 per tonne.</td>
</tr>
<tr>
<td></td>
<td>• Farmers use urine and dry solids from UDDT.</td>
<td>• Farmers use urine and dry solids from UDDT.</td>
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<tr>
<td></td>
<td>• Use of FS is not new.</td>
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</table>
Soil Conditioner

Preference form of dried FS

Most farmers would prefer FS sold in form of fine powder.

In Dakar and Kampala, FS is currently sold in a crumby form but farmers have to crush it further during application.
Summary of existing strong market potential, based on current situation

<table>
<thead>
<tr>
<th></th>
<th>Dakar</th>
<th>Accra</th>
<th>Kampala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Biogas</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Protein source</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil conditioner</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>
CONCLUSIONS

Many of our conclusions are based on the current situation, but if FS had a value, then would increase the supply.

For new markets to develop, need to demonstrate first – e.g. converting from liquid to solid fuels

FS market is by far not exploited yet
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THANK YOU FOR YOUR ATTENTION

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