Waste Transformation, Not Waste Treatment:
Lessons learned from Sanivation’s Value-added Processing of Fecal Waste

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Traditional Sanitation is expensive

Designed to minimize risk of disposing feces into environment
Need for Fuel in Kenya

- 80% HH in Urban areas
- $1.8 Billion/year Market
- In 10 years
  - Price almost tripled
  - Demand almost doubled
Sanivation
Waste Reuse instead of disposal

Sanitation service
Waste treatment and transformation
Charcoal briquettes
## Choosing a Reuse Product

### Five Key Metrics

<table>
<thead>
<tr>
<th></th>
<th>Revenue</th>
<th>Profit</th>
<th>Safe Reuse</th>
<th>Market size*</th>
<th>Value of Feces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feces Pellets</strong></td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Carbonized feces fuel</strong></td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Dried feces</strong></td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Charcoal Briquettes</strong></td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

* Highly dependent on location
Feces Briquette Production Results

• $200/ ton
• 20 tons a month
• In 2016 sold over 30 tons
  • Local restaurants
  • Chicken Farms
Financial Insights

Gross Margin of Feces Briquette Production

- USD per month
- COGS Fuel
- Revenue / month
- Gross Revenue

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Financial Insights

Cost of feces briquette production at 20 Tons/Month.
Total: $2,810

- Production: $1,320.00 (47%)
- Treatment: $420.00 (15%)
- Biomass Acquisition: $1,070.00 (38%)
Challenges and Key Insights

• Value from feces can increase when combined with other waste streams

• Relying on waste streams is risky due to variability

• Waste characterization and quality control is key to scaling
Next Steps

1. Detailed characterization and classification for alternative waste streams
2. Cascade model to develop fuel portfolio
3. Expand to new waste sources and fuel products
4. Develop PPPs for future scaling and expansion
Concluding thoughts:

• Deliberate choice on reuse
• Gross margins positive - SCALE
• Waste Treatment can be much more efficient when DESIGNED for reuse

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