Case Study:
Experimental Approach to Determine Dewaterability of Faecal Sludge in Dar es Salaam, Tanzania

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Getting from research question to pilot-scale

Focusing on:
- Specifying a research question
- Selecting the right parameters to measure
- Picking the right SOPs
- Preparing samples
- Interpreting lab results
Research question

Can we use locally-available materials to make conditioners to improve faecal sludge dewatering?

“Improved dewatering” = faster dewatering and drying on sand drying beds
Planning data collection

How to determine best dose for each conditioner?

Do a jar test!

Photo: optik-technik.com
Planning data collection

Next, select a metric for approximating “dewatering time” on drying beds

Capillary suction time (CST)
Planning data collection

Need to measure anything else?

Conditioner dosing reported as amount of conditioner/ mass TS in faecal sludge

CST reported as seconds
Planning sample handling

- 4 x 1L composite sample
  - homogenize by stirring
  - 1L composite sample
    - homogenize with blade
    - 200 mL for TS, TSS
    - 800 mL for jar tests and CST
Interpreting results

Which is the optimal dose of chitosan?

Average CST reduction

![Graph showing CST reduction vs dosage for different concentrations of chitosan.](image-url)
Interpreting results

### Optimal conditioner dose (kg/tonne TS)

<table>
<thead>
<tr>
<th></th>
<th>Chitosan</th>
<th><em>Moringa oleifera</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar</td>
<td>1.5 – 3.8</td>
<td>400 – 500</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>2.5 – 3.0</td>
<td>250 – 750</td>
</tr>
</tbody>
</table>
Scaling up
Scaling up
Scaling up

Cycle 1 (18.3 g/L TS)

Cycle 2 (30.3 g/L TS)

Cycle 3 (39.3 g/L TS)

Time (days)

TS content (%)
MEWS team: Management of Excreta, Wastewater and Sludge

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