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FAECAL SLUDGE BRIQUETTES-CAN IT BE A VIABLE BUSINESS IN KAMPALA? A CASESTUDY OF PARTNERSHIP BETWEEN NWSC AND WATER FOR PEOPLE

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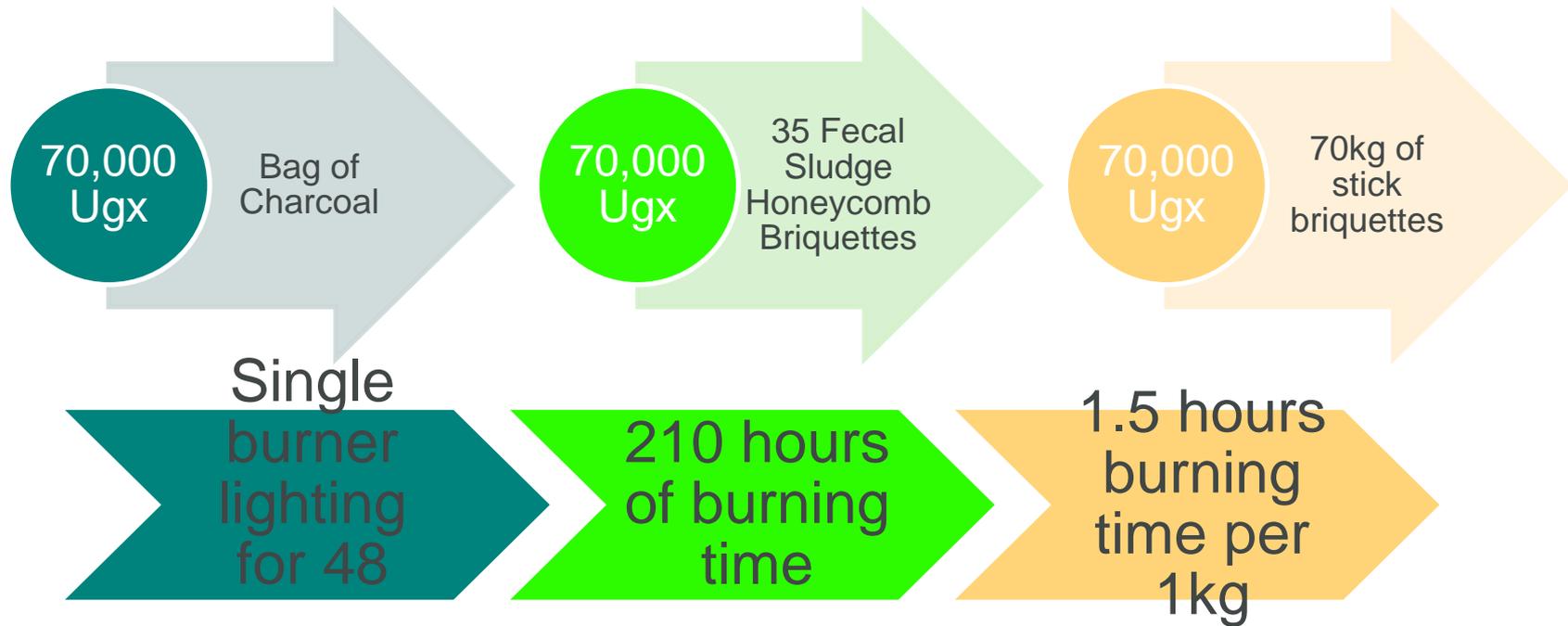


THE CHALLENGE



- FS has been regarded as a hazardous material, given little attention about energy recovery from the bio solids
- The most common reuse option has concentrated on direct application of bio solids onto garden- risk of pathogens especially for vegetables eaten raw
- One product of FS that is most likely to be free of pathogens is the briquettes
- The pathogens are killed during the carbonization or pyrolysis process that requires high temperatures
- FS briquettes can be used to replace the wooden charcoal briquettes hence reducing pressure onto the forests in search for charcoal
- FS products are normally challenged by community attitudes due to various beliefs and taboos around faeces handling

Why Fecal Sludge Briquettes?



The briquettes are 4.4 times more cost effective than the normal charcoal

WHY KAMPALA?



- Water For People piloted FS briquettes in Kole with a viable business running under SAWA

According to National Charcoal survey of 2015

- About 837 Metric Tonnes of charcoal are supplied to Kampala per day in dry season and 1,017 Metric Tonnes of charcoal in the rainy season
- Furthermore, central region is the main source of charcoal supplied to Kampala (63.4%), followed by northern region (21.8%)
- On average, a household spends more (UGX 2,015/=) on the main cooking fuel per day during the wet season than in the dry season (UGX 1,942/=)
- Households in Kampala purchase a bag of charcoal at an average price of UGX. 120,000/=
- Overall, about 4,961 metric tonnes of charcoal is used by households in Uganda per day

CURRENT RESEARCH



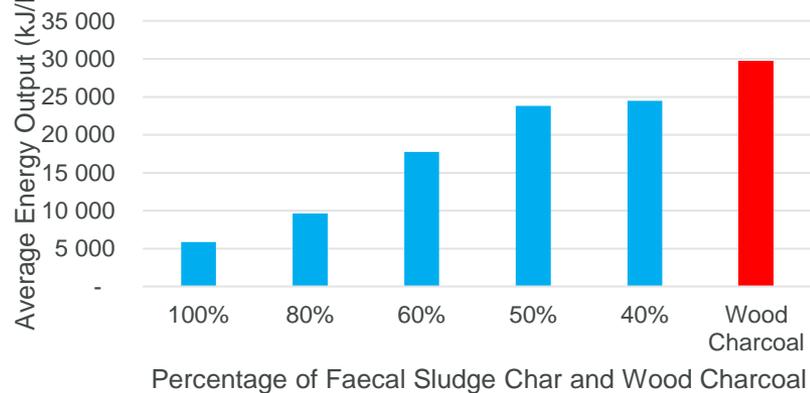
- Tested two types of sludge; Bottom Settled and Top Scum
- Tested different combinations with varying amounts of FS and charcoal dust; 100%FS, 80%FS, 60%FS, 50%FS, 40%FS
- Partnered with CAPIDA/SEACO to produce test briquettes
- Carried out tests at CREEC (fuel properties), Central Government Lab (Emissions), Microbiology lab at COVAB-Makerere University (Pathogenic occurrence) and our own mini lab (MC, Ash Content, burning properties and boiling tests)

Results so far

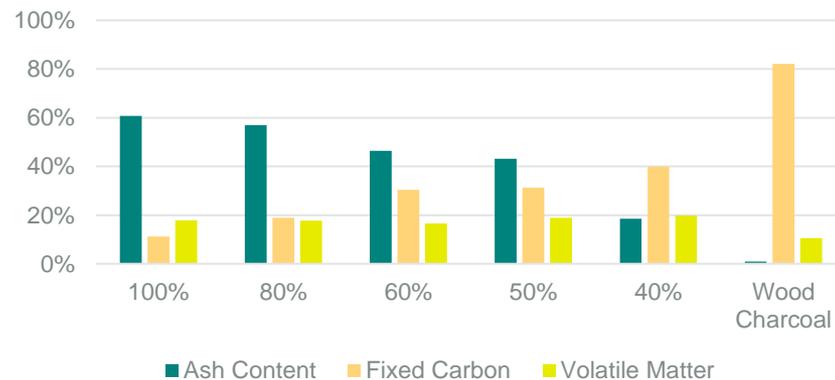
- Top scum briquettes overall perform better than bottom sludge briquettes (less sand)
- Organic emissions such as PCBs, Furans and Dioxins were at non-detectable levels
- SO₂, SO₃ levels detected at below 5% and this reduced with reduction in FS
- NO₂ levels at below 1% reducing with decreasing FS content
- P₂O₅ levels at below 10% reducing with decreasing FS Content
- Safety: Briquettes tested negative for Faecal Coliforms, E.Coli and Ascaris (carbonization process at temperatures of above 100 degrees)



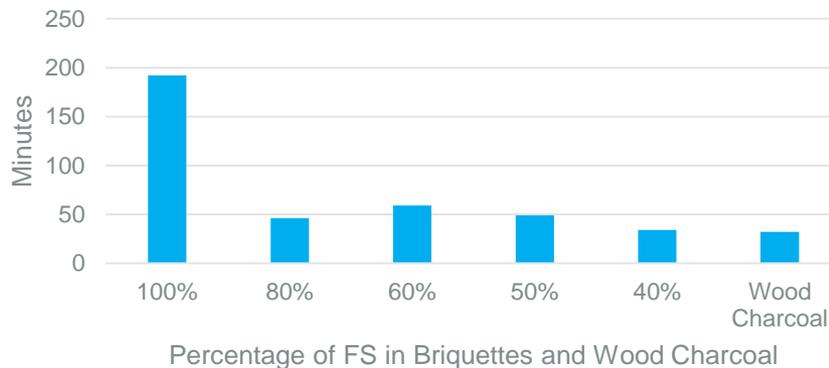
Average Energy Output against Percentage of Faecal Sludge (Top Scum) in Briquettes and Wood Charcoal



Comparison of Wood Charcoal and FS (Top Scum) Briquettes



Time to Boil 5 litres (cold start)



Overview of Current Operation –2 Tonne per Week



Sludge Sourcing & Drying



Dedicated sludge drying bed at Lubigi modified by WFP. Additional bays required for expansion

Carbonization



Major emphasis on commissioning of new unit at Lubigi and evaluation of two new alternatives for expanded operation

Briquette Production



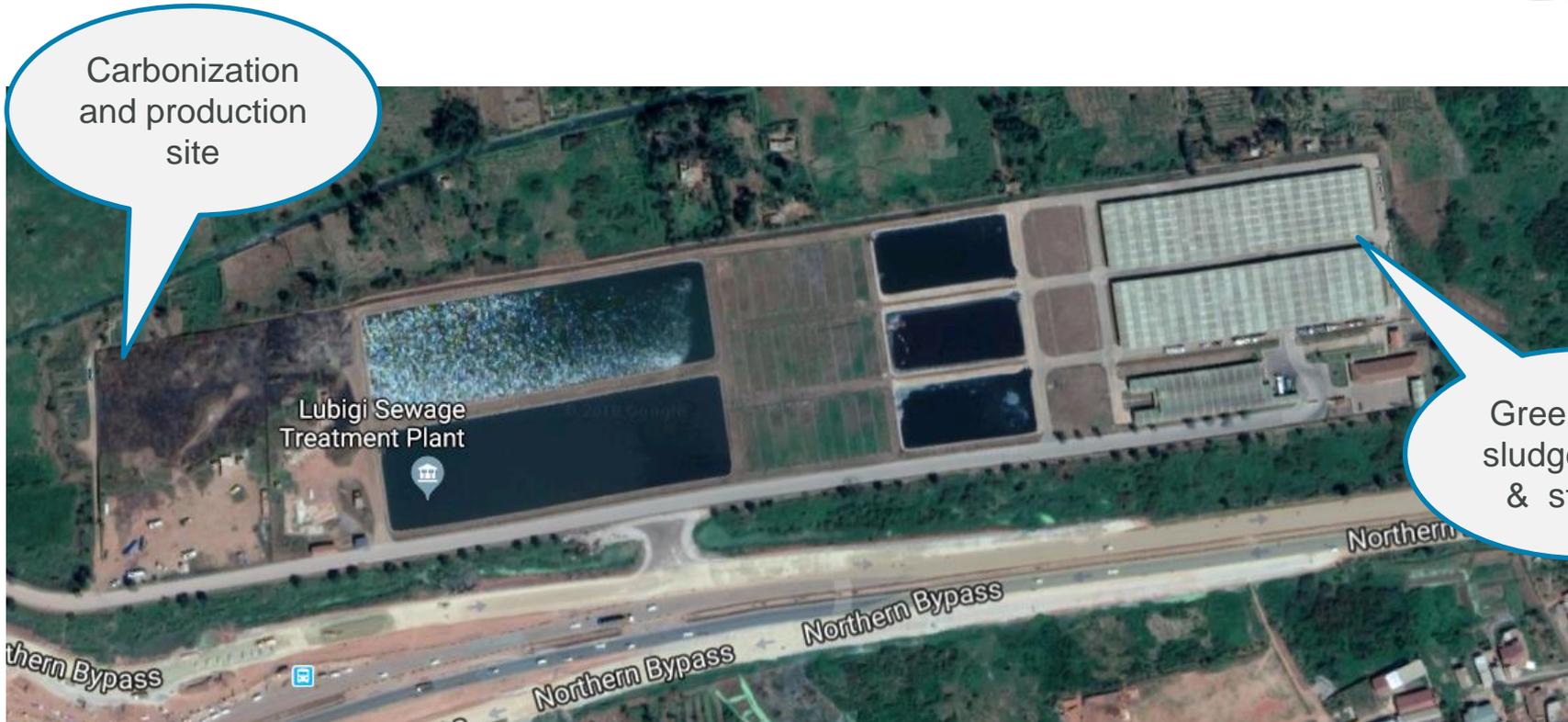
Honeycomb and stick production currently at Nyanama. More efficient, expanded facility planned for next phase at Lubigi

Marketing & Sales



Experimenting with new wholesale arrangement for sale of stick & honeycomb briquettes. Target markets are supermarkets and chicken farmers

CURRENT OPERATIONS AT LUBIGI TREATMENT PLANT



Carbonization and production site

Greenhouse sludge drying & storage

Water for People currently operating sludge drying/storage ,carbonization and production facilities at National Water & Sewerage Corporation (NWSC) Lubigi Wastewater Plant

PRODUCTION AND SALES STATISTICS



- Operations started in October 2018 at Nyanama with two products; sticks and honeycombs
- Production to Date: More than 10 tonnes of briquettes produce
- Sales to Date: More than 3 tonnes of briquettes sold
- Customers: Chicken farmers, households, Restaurants
- Trained 3 smaller businesses on incorporating of FS into their briquette process under RRR project with GIZ
- Worked with distributor Sheercare to expand market

KEY DECISIONS AND CHALLENGES



1. Process Engineering and Technology Development
 - Raw sludge sourcing & handling
 - Carbonization – selecting and implementing new alternative
 - Briquette production
2. Defining business model, Water for People role and NWSC role
 - Consolidating space and sludge availability issues
3. Marketing & sales – defining target markets and establishing arrangements
4. Staffing – when to bring people on
5. Product design & quality assurance

