Resource recovery workshop – FSM3 conference

Faecal sludge to solid industrial fuel

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Eawag: Swiss Federal Institute of Aquatic Science and Technology

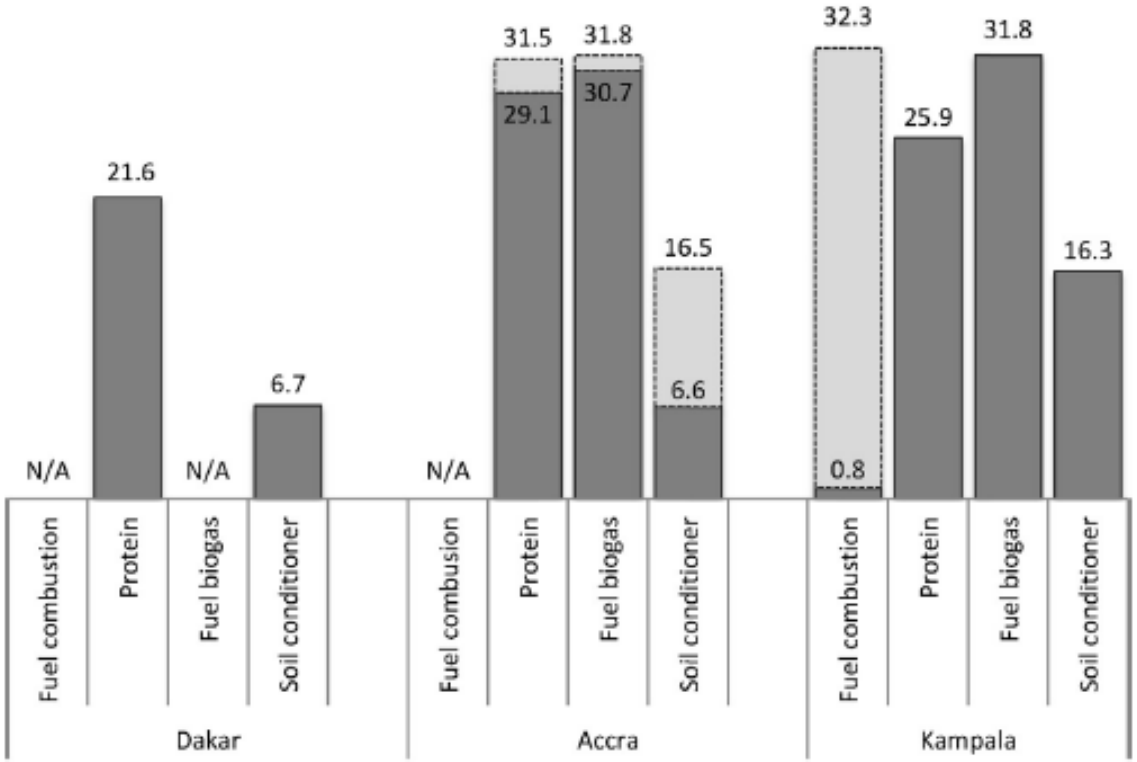
Faecal sludge to fuel

Presentation outline

1. Faecal sludge fuel production (Dr. Seydou Niang).
2. Faecal sludge combustion (Dr. Seydou Niang).
3. Environmental and operational considerations (Mr. Moritz Gold).

Why use faecal sludge as a solid fuel?

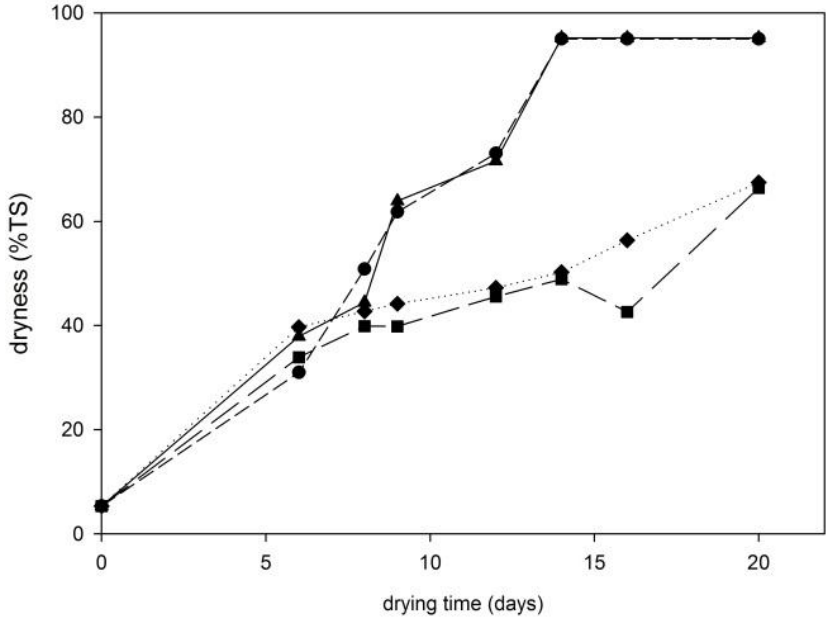
High revenue potential in urban Sub-Saharan Africa



Diener et al. (2014): Resources, Conservation and Recycling 88, 32–38.

Transforming faecal sludge into fuel

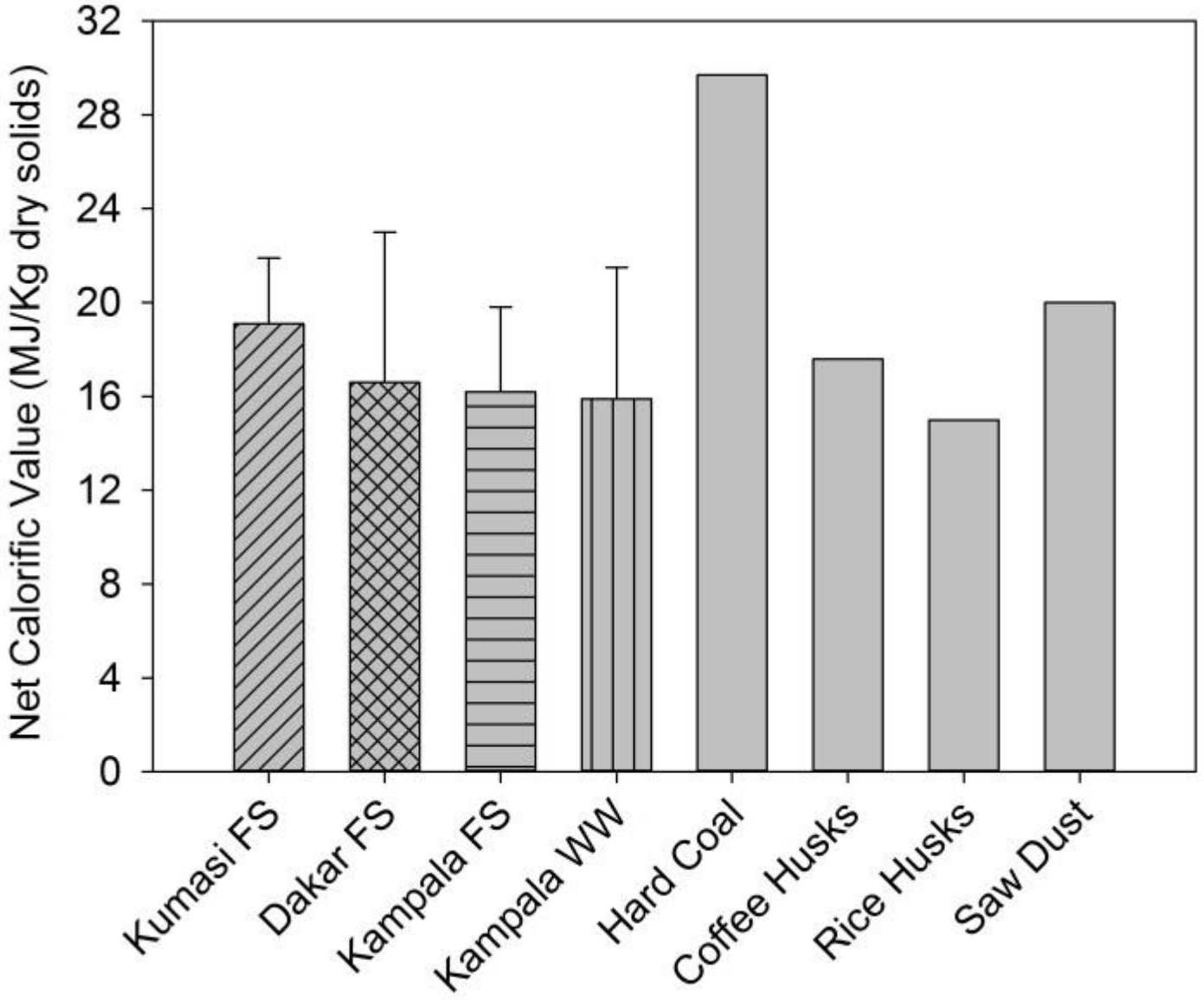
Pilot-scale research in Dakar



- 90% dryness required by industries.
- Turning increased drying rate by 20%.
- Operation of ventilated greenhouses needs to be developed for the local climatic conditions.
- Helminth eggs in final fuel detectable → additional advantage of energy recovery.

Dried faecal sludge

Energy value comparable to other solid biofuels



Muspratt et al. (2014): WASHDev

Product development with industries

Pilot-scale kiln research in Dakar

Product development with industries

Pilot-scale kiln research in Kampala

Faecal sludge to energy

Opportunities & challenges

- Important to select resource recovery technology based on local market demand.
- Vicinity to urban market reduces transport costs.
- Energy recovery reduces need for pathogen removal.
- High ash content and low fuel quantities for industry-scale markets.
- Concentration of phosphorus and heavy metals in the ash.
- Solid fuel has higher revenues compared to using it as a soil conditioner in agriculture.

Ongoing & future research

Faecal sludge to energy

- SEEK project (www.sandec.ch/seek): Pelletizing and gasification of faecal sludge and other urban biowaste to produce fuel pellets and electricity.
- Technology development of drying beds to increase product quality (e.g. geotextile).
- Potential of slow-pyrolysis/carbonization and hydrothermal carbonization (HTC) to produce char from faecal sludge.

Thank you for your attention

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