#### EXCRETA AND WASTEWATER MANAGEMENT

# SEEK (Sludge to Energy Enterprises in Kampala): Innovative resource recovery from faecal sludge

In Kampala, Sandec and its partners research the viability of co-processing of faecal sludge and other urban waste streams to produce fuel pellets and with these electricity through gasification. The SEEK project will establish a pilot-scale research facility at NWSC Lubgi Wastewater and Faecal Sludge Treatment Plant and will conduct market research to provide reliable data, working towards market implementation of technologies and endproducts.

### Context

In urban Sub-Saharan Africa, the sanitation needs of the majority of the urban population are met by onsite sanitation technologies. In Kampala, Uganda, these technologies provide for the sanitation needs of 95% of the population, approximately 1.8 million people. The management of accumulated faecal sludge poses a huge challenge for the city. Currently, inadequate or unaffordable faecal sludge collection, transport and treatment are the reality for a large fraction of the population, resulting in the dumping of untreated faecal sludge into the environment, jeopardizing environmental and public health. This problem is intensified by the lack of appropriate management solutions for other urban waste streams, such as market waste and waste sludge from water and wastewater treatment. Instead of only being a disposal problem, resource recovery from faecal sludge can provide resources (energy and nutrients) for urban development and revenue to offset treatment costs and increase access to sustainable sanitation. Currently, technologies and business models to maximize benefits from resource recovery based on market demands for endproducts is missing. As part of the FaME project (www.sandec.ch/ fame) Sandec and its research partners showed that dried faecal sludge has a an energy content competetive to other solid biomass fuels and FS combustion in industries is technically feasible. In Uganda, electricity demand outstrips the electricity generation capacity and industries are in demand of solid fuels. Building on the FaME research, to meet these demands, SEEK will study co-processing of faecal sludge with other urban waste stream into fuel pellets and electricity through gasification.

Dried faecal sludge can be used as a solid fuel in industries. SEEK studies processing it into fuel pellets and electricity.

#### Goal

The goal of SEEK is to work towards making resource-recovery based solutions to waste management a reality, thereby providing new business opportunities, and increasing access to renewable energy and electricity while improving public and environmental health in urban areas through the provision of sustainable sanitation service chains.

### Activities

The SEEK project consists of the following key activities:

- Identify suitable waste streams for pelletizing and gasification based on criteria such as accessible waste quantities, logistics and quality (energy content, moisture, heavy metals). Next to faecal sludge this analysis will also include other waste streams such as sludge from water and wastewater treatment.
- Investigate innovations for cost-effective drying of faecal sludge such as turning of sludge on the surface of drying beds.
- Contextualize innovative pelletizing and gasification technologies. This will include operation of a 50 kg/h pelletizer and 10kW gasifier at NWSC Lubigi Wastewater and Faecal Sludge Treatment Plant.
- Assess the environmental impact of pelletizing, gasification and the value chain.
- Identify business models, value and supply chains with potential implementers of technologies and users of endproducts.
  Workshops will be conducted to work towards full-scale implementation and replication of the SEEK pilot.

## Duration:

September 2014 to August 2016

#### Partners:

- > Makerere University, Uganda
- > Centre for Research in Energy
- and Energy Conservation
- (CREEC), Uganda> Bioburn AG, Switzerland
- National Water & Sewerage
- Corporation (NWSC), Uganda

#### Funding:

- > Symphasis Foundation
- > REPIC: Renewable Energy &

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#### Further information: www.sandec.ch/seek

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Symphesis REPIC Renewable Energy & Energy Efficiency

Schweizerische Eidgenossensch Confédération suisse Confederazione Svizzera Confederazium svizra Swiss State Secretariat for Economic Affal Swiss Agency for Development and Coope Swiss Federal Office of Energy SFOE



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