eawag aquatic research

**Sandec**
Water and Sanitation in Developing Countries

# FaME: Innovative Solutions for Resource Recovery from Faecal Sludge

**Sewage sludge is already used as an alternative solid fuel in industries in Europe and the USA. In the capitals of Senegal, Ghana and Uganda, Eawag/Sandec and an international consortium of researchers, consultants and practitioners aim to provide a revenue stream for the faecal sludge value chain by transferring this knowledge to faecal sludge.**

## Context

In Sub-Saharan Africa the majority of urban residents rely on on-site sanitation systems. If properly managed, on-site sanitation technologies can provide appropriate and sustainable sanitation. However, the management of faecal sludge, the (semi-) liquid waste collected from on-site sanitation technologies, is currently characterized by poor collection services and frequent dumping of untreated faecal sludge directly into the environment. A major reason for this is the lack of economic incentives for stakeholders. The resource value of faecal sludge is widely recognized and designing faecal sludge service chains that effectively recover these resources can provide a financial driver to enhance service at each step in the chain.

## Goal

The overall goal of the FaME project is to demonstrate innovative and profitable resource recovery options for faecal sludge treatment products that will generate revenue to improve the service chain, and increase public and environmental health in urban centres of Sub-Saharan Africa.

## Activities

The FaME project consists of the following key activities:

- A market demand study in Kampala, Dakar and Accra to identify the market potential for innovative faecal sludge end-uses.
- Demonstration of the technical and financial viability of using dried faecal sludge as a solid biofuel in industrial kilns.
- Development and implementation of a tool to assess the financial viability of faecal sludge end-uses and presenting the corresponding business models in the project cities.
- Dissemination of the research findings.

## Outcomes

Market demand studies conducted in Dakar, Kampala and Accra identified possible markets for five faecal sludge end products: use as an industrial fuel, as a source to produce protein for animal feed, a source to produce biogas, a component in building materials, and a soil conditioner or fertilizer. While faecal sludge is already used to some extent as a soil conditioner, the other end-products represent potential revenue generating sources that have not yet been implemented. Analysis of the calorific value of faecal sludge from different on-site sanitation technologies has shown its potential as a fuel source. On average, the calorific value of faecal sludge was 17 MJ/kg dry solids, thus, highly competitive with local biofuels.

In Dakar, research is being done to increase drying rates. Given the low solids content of faecal sludge, providing cost-effective drying methods is a key challenge. Pilot-scale kilns in Dakar and Kampala are in use to research the use of faecal sludge as a fuel.

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Pilot kilns in Dakar, Senegal and in Kampala, Uganda

**Duration:**
April 2011 to March 2014

**Partners:**
› Waste Enterprisers Ltd, Ghana
› Makerere University, Uganda
› Université Cheikh Anta Diop, Senegal
› Office Nationale de l`Assainissement du Senegal, Senegal
› Hydrophil iC GmbH, Austria

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