Faecal Sludge Management
Solar sludge drying in Bangladesh

Introduction
This document summarises an action research project currently nearing completion in Bangladesh. A novel solar drying approach to FSM has been developed and is being tested under different weather conditions, including the monsoon.

Situation
Efforts to improve access to sanitation have led to a significant increase in the use of (pit) latrines and septic tanks across Bangladesh. Unfortunately, they fill up, and as there is little safe emptying, transportation, treatment and disposal mechanism in the country, most of the contents of these latrines are ending up in open drains and water-bodies, undermining the gains made through increased sanitation coverage.

Challenges
We need to understand how best to manage this faecal sludge (FS) so that rather than being a detriment to the local environment, it can be a benefit.

In the absence of centralised wastewater systems, on-site or localised solutions are needed. These need to have a low electrical power demand, be simple to operate, easy to understand, scaleable, affordable, practical and safe.

Within these constraints, the main challenge of the project was to develop a design that could dry FS to a safe and handleable consistency in a reasonable period of time, so it could be used as an agricultural fertiliser.

Solution
Combining proven technologies (large open sludge drying beds, slow sand filters, greenhouses) we have developed roofed modular drying beds.

The drying beds currently made out of brickwork rendered in concrete, with a slow sand filter in the base, and are topped with a clear plastic roof. This roof not only increases heat gain (reducing drying times) but also prevents rain re-wetting the sludge.

Sludge is poured into the bed through a mesh/grill to capture inorganic solid waste and prevent it from entering the beds and resultant compost.

A reedbed is used to treat the wastewater effluent for safe discharge into the local environment.

Different design options have been tested; flat bases or sand filters, various types of roofing (plastic, metal, thatch and none), as well as ventilation and raking strategies.
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Input
Mixture of solid and liquid sludge with solid waste

Output
inorganic waste
Wastewater
Dried Sludge

Treatment
Landfill/ Other remediation
Reedbed
Co-composting for minimum 15 days

Final Disposal
Held in pond and used to maintain moisture content of compost
Discharged into local watercourse

Results
Tests have shown a 99% reduction in key indicator pathogens such as E.Coli after 10 days of drying, and the resultant material can be easily handled and co-composted for final treatment.

By following the drying process with composting further reductions can be achieved; initial results from composted sludge (five months after removal from the bed) show near null levels of E.Coli.

More Information
WaterAid is doing a lot of work globally on faecal sludge management and we are very interested to hear from others working in this area to share ideas and experiences.

Please contact: sanitation@wateraid.org
Or see the informal project blog at: http://fsmactionresearch.blogspot.com/

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