

BUSINESS MODEL PROFILES: NUTRIENTS

SUMMARIZED FROM THE FORTHCOMING PUBLICATION
RESOURCE RECOVERY FROM WASTE



RESEARCH PROGRAM ON
Water, Land and
Ecosystems



Outsourcing Fecal Sludge Treatment to the Farm

Business characteristics

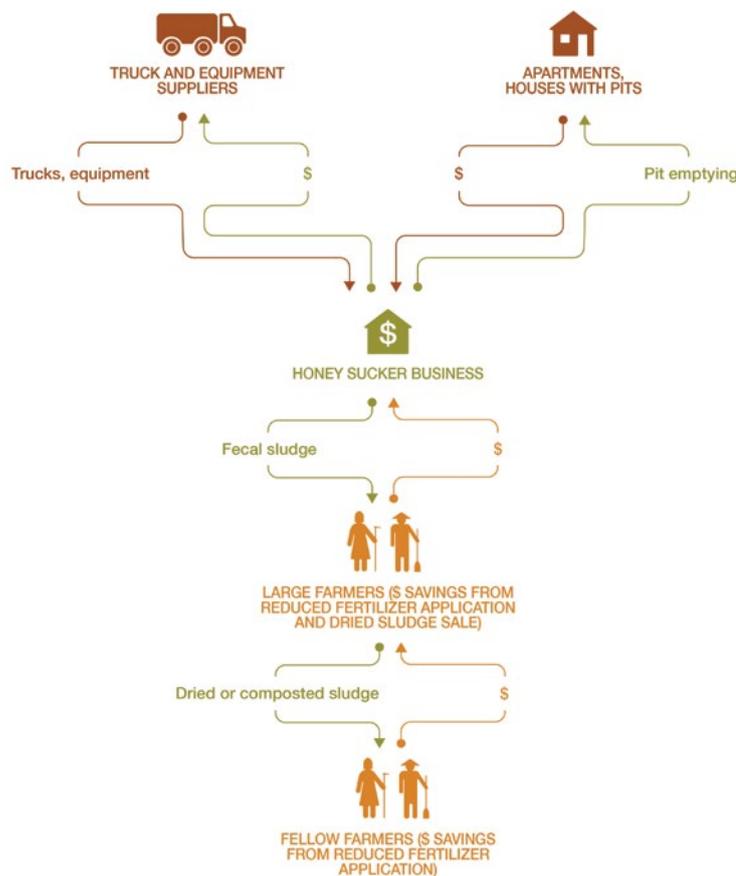
Geography	Urban population with no connection to a sewerage network and use of on-site containment such as latrines or septic tanks with off-site disposal. Dry climate over a 3-month period for on-farm sludge drying before application
Scale of production	20,000 people served per truck per year (single homes and apartment blocks)
Type of organization	Private (but also public possible)
Investment cost range	Variable but low; depending on fleet size, around USD 10,000 to 24,000 per truck (used or new)
Key costs	Truck purchase, maintenance and fuel, labor wages, and legal dumping fees (for sludge not absorbed by farmers)
Revenue stream	Pit latrine emptying fees and sludge sales on-farm

Business model

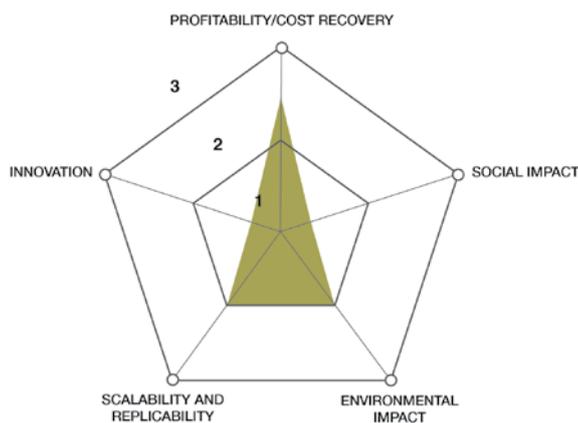
The business model fills a gap where fecal sludge treatment facilities are lacking and is based on the collection of fecal sludge from households for sale to peri-urban farms or plantations, where the material is treated on-site and used as manure. This provides households with on-site sanitary cleaning services, ensuring that septic tanks get emptied and thus a clean property, and farmers with a cheap but high-nutrient manure which can replace or supplement chemical fertilizer.

This business model can be used by private enterprises in smaller and larger towns and cities with a significant share of on-site sanitation facilities, such as septic tanks and cement pit latrines, at households or office/apartment blocks in need of servicing, i.e., desludging. These small transport businesses which collect fecal sludge for a fee where no official service is provided have been termed “honey suckers” in India. In the model, instead of disposing of the waste at approved dumpsites which charge money or illegally without paying, the truck drivers deliver the sludge to farmers for a fee, thereby reversing the cash flow. Farmers can then treat and process the sludge they buy to use on their fields or sell to fellow farmers.

BUSINESS MODEL VALUE CHAIN



Business performance



The business model has a high potential for being scaled up (e.g., by offering a maintenance service for latrines), and can generate profit under the right legal circumstances through the use of economies of scale, as well as have a significant positive environmental impact with the reduction of fecal sludge-based pollution in cities, especially where transport services dump illegally.

Main risks

Market risks: Risks can occur due to the seasonal variability in demand from farmers for fertilizer. Consumer acceptance of crops grown using fecal sludge can also create a barrier where farm practices are known.

Competition risks: Risks for small-scale businesses are high, with low new entry barriers to the market for other potential competitors.

Technological risk: There is a risk from the reliance on the availability of specialized trucks and equipment, as well as parts and repair expertise.

Political and regulatory risks: Regulatory risks exist for the businesses as long as they operate in an ex-legal manner (which is very common), as this forms a barrier to enterprise growth and maturation.

Safety, environmental and health risks: Health risks to consumers of farm products are possible where sludge is not well treated and crops or humans get in contact, i.e., where on-farm sludge handling practices do not follow safety standards.

Case study: Bangalore, India

Due to shortcomings in sewage treatment systems and the availability of a large number of cement pit latrines without sufficient servicing/emptying in the city of Bangalore, India, an informal sector of micro-business ventures named “honey suckers” has emerged to fulfil the market need for on-site sanitation services. These businesses, which now number about 300, collect fecal sludge from pit latrines for a fee. The sludge collected is disposed of either at an approved site (rarely) or more typically it is dumped illegally on open lands or into drains.

A secondary market has emerged in which the honey suckers deposit the sludge on farmlands to be

used as fertilizer. In this way, the honey suckers not only avoid the disposal fee, but they might also reduce transport costs and generate revenue if the farmer tips the truck driver delivering the waste. This informal business arrangement has generated some significant benefits, including reduced environmental pollution from illegal dumping, improved sanitation, and availability of manure for farmers. However, the illegal, unregulated aspect of the business creates potential problems, with non-standardized on-farm treatment procedures, and requires a supportive legal framework to regulate the market.

Key performance indicators (as of 2015)

Capital investment:	Variable, depending on the fleet size - cost per truck is USD 24,000 (new)		
Labor:	Variable, depending on the fleet size - three people per truck		
Operation and maintenance cost:	USD 7,500/year, excluding legal dumping fees		
Output:	20,000 people served per truck per year (single homes and apartment buildings); farms and consumers served are difficult to assess given the informality of the practice		
Social and environmental impact:	Possible reduction of open-dumping of fecal sludge, improved sanitation and availability of organic fertilizer for farmers		
Financial viability (for truck operation):	Payback period: ~9 years	Rate of return: 98%	Gross margin 81%

For more information on the business model and related cases, see Chapter 12 of **Otoo, M.; Drechsel, P. (Eds.). 2017. Resource recovery from waste: Business models for energy, nutrient and water reuse in low- and middle-income countries. London: Earthscan/Routledge. In press.** The book has been produced by the Resource Recovery and Reuse subprogram of the International Water Management Institute (IWMI), under the CGIAR Research Program on Water, Land and Ecosystems (WLE) and its Rural-Urban Linkages Research Theme. The support of the Swiss Agency for Development and Cooperation (SDC), the International Fund for Agricultural Development (IFAD), and CGIAR Fund Donors (www.cgiar.org/about-us/our-funders/) is gratefully acknowledged.