Monday 19 January 2015 – CONFERENCE DAY 1 – Program

Room 2

14.30 – 16.00 FSM as a Business – session 2

Moderator: Jay Bhagwan, Water Research Commission, South-Africa

FSM business models for developing countries  - Chaitanya Krishna Rao, International Water Management Institute, Colombo, Sri Lanka

FSM by a Water Trust in Zambia: The case of Kanyama - Martin Mulenga, Environmental Engineering and Water Technology Department, UNESCO-IHE Institute for Water Education, Delft, The Netherlands

Social franchising principles developing micro-businesses and improving FSM quality and reliability  - Oliver Ive, Amanzabantu Services Ltd, East London, South Africa

Four “Control-Cards System” for FSM improvement In Indonesia  
Bob Sinarko Wibowo, PT Haskoning Indonesia, part of Royal HaskoningDHV, Jakarta, Indonesia

The “Earth Auger”, testing and introducing in Latin America’s market a new technology on decentralized sanitation -  Marcos Fioravanti, Fundación in Terris, Sustainable Rural Development, Guayaquil, Ecuador
Fecal Sludge Management Business Models for Developing Countries

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Theme: FSM as an enterprise
Key Words: Fecal sludge management, septage, resource recovery and reuse, market-driven mechanisms, business models

Background

On-site sanitation systems such as septic tanks and pit latrines are the predominant solution for access to toilets in both urban and rural areas in developing countries. Despite significant efforts to increase access to improved sanitation, investments in safe collection, disposal and treatment of fecal sludge from on-site sanitation systems remains a challenge (Kumar, 2003; Kone, 2010; Drechsel and Murray, 2011;). Often, lack of emptying and treatment services results in unsafe disposal of sludge, which fallouts into health and environmental hazards that may undermine the achievements made by improvements in drinking water supply, toilet and health services provision. In fact, the lack of appropriate emptying and treatment services results in a postponed open defecation for people subject to the unsafe fecal sludge handling.

Improved access to sanitation is one of the major policy goals throughout developing countries. Main emphasis so far has been on the eradication of open defecation, hygiene, and improved toilet facilities, ideally connected to sewer systems where urban centers are exploding. However, with limited public funding to expand piped sewerage network in many low-income countries, on-site sanitation systems and fecal sludge management represent a comparatively lower cost solution (Chowdhry and Koné, 2012; Dodane et al., 2012) with the additional advantage of lower water and energy requirements for pumping and flushing increasingly larger sewage networks. While water and sanitation are mostly managed by government agencies which also, in the best of cases, provide and maintain the sewer network systems, build wastewater treatment plants, and establish policies on sanitation and environmental guidelines (Chowdhry and Koné, 2012), on-site sanitation systems are mostly handled by the informal and private sector and in many regions it falls outside the utility jurisdiction. Fecal sludge management is increasingly gaining business-oriented thinking from private, public and public-private actors. Furthermore, private players' stake (both formal and informal) in the sanitation sector, usually dominated by the public, is gradually increasing.

Another aspect of fecal sludge management, aside from safe collection, treatment and disposal, is resource recovery which is led by market based principles that looks at waste as an asset, could offer incentives for business development and cost recovery (Murray and Buckley, 2010). Thus, instead of degrading the environment, resource recovery and reuse seeks to shift the focus away from waste that needs disposal toward creating a valuable resource that can benefit farmers, create jobs and generate funds to improve sanitation, a timely incentive for scaling up private sector involvement. Resource recovery and reuse of urban septage as peri-urban fertilizer has so far been largely an informal sector activity (Kvarnström et. al., 2012). But with the increasing interest in a green economy, and new technical innovations for energy and fertilizer generation there is scope for resource recovery to play an increasingly significant role (EAI, 2011). Indeed, an emerging set of entrepreneurs are recognizing the opportunities in human waste and gradually playing an important role in leveraging private capital to help realize commercial value in waste, shifting the focus from
treatment for waste disposal to treatment of waste as a resource for reuse for the
ultimate benefit of poor farmers and households (Murray and Buckley, 2010; Murray
et al., 2011, EAI, 2011). This necessitates the development and promotion of market-
driven mechanisms – innovative business models to incentivize private sector
participation in the sub-sector of collection, transportation as well as valorization of
fecal sludge that can help improve cost recovery of the entire sanitation value chain.

Fecal Sludge Management Business Models
The aim of the presentation is to derive and analyze business models for fecal sludge
management from existing business cases across Asia, Africa and Latin America. The
study is based on field study, literature review, and structured interviews. The field
study is part of a program of the CGIAR on Water, Land and Ecosystems called
Resource Recovery & Reuse (RRR). The RRR program is addressing the challenge by
identifying innovative enterprises that reuse agro-industrial and domestic waste
including fecal sludge, in low income countries and gather pertinent data on how their
businesses operate. The analysis of the business cases forms the basis to develop
conceptual business models for fecal sludge management. The presentation adopts
Ostwerwalder Business Canvas framework to describe the business model and their
management, financial and economic aspects (Osterwalder and Pigneur, 2010).
Typology of the business model is developed based on factors that influence fecal
sludge management such as accessibility of on-site sanitation system, organization
structure (public, private includes informal, and public-private partnership), technology
(manual and mechanized), institutional framework and valorization of human waste.
The business models are analyzed and explained through the lens of actual business
case from developing countries. Examples of business cases involved in fecal sludge
management are used to extract the business models are described in the
presentation.

Significance and Impact of Presentation
It is an expensive undertaking to provide appropriate service delivery for sanitation
systems from collection, through treatment and reuse. A business approach to certain
steps of the service delivery chain is therefore of great importance and it is the focus of
this presentation. The target audience for this paper is municipalities, governments,
donors, policy makers, entrepreneurs and non-governmental organizations from
developing countries, who all can benefit from a deepened understanding of existing
experiences in service delivery for on-site sanitation systems, which is improving both
profitability within the service delivery chain as well as its environmental performance
by applying resource recovery. The presented business models can be further adopted
in the context of the target audience’s operational environment and region.

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Faecal Sludge Management by a Water Trust in Zambia - The Case of Kanyama, Lusaka

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Key words: Faecal Sludge Management, Water Trust, Community Managed Sanitation

Background

One of the major development challenges that the majority of African and Asian countries face is that of providing safe sanitation services in both urban and rural areas. While efforts have been made by some governments to provide a basic level of these services to the population, the coverage levels have remained insufficient and 2.5 billion people still do not have access to improved sanitation services (WHO/UNICEF, 2014). Access to improved sanitation is generally a problem in most low-income urban communities in Africa and Asia due to inadequate service provision by sanitation agencies, dense population and limited availability of land (Mulenga, et al. 2004).

Although Zambia has just recently been re-classified as a lower-middle income country by the World Bank, still very few people have access to improved sanitation. The latest WHO/UNICEF (2014) statistics show that only 43% of the national population and 56% of the urban population have access to improved sanitation facilities. The majority of people in urban centres in the country live in informal settlements and in Lusaka, for example, up to 65% are estimated to be living in these informal settlements. These settlements are however, poorly serviced with sanitation services and the majority of people depend on on-site sanitation systems.

The problem with most of the on-site sanitation systems however, is that they need to be desludged at some point but however, there is little or no faecal sludge management services in place in most situations. For those residents with limited space around their yards, which is the case in most places, there is no option of building a new pit once their old fills up. In some cases, pit latrines are normally emptied using either manual or mechanical methods. Thicker sludge is usually dug out by hand while the more fluid waste is removed with buckets. The safest way, and most convenient way of removing fluid sludge, however, revolves around the use of vacuum trucks where atmospheric pressure forces the pit contents along a hosepipe into a vacuum tank. Because of exorbitant costs involved with mechanical forms of desludging and the limited space around houses in most urban poor communities, use of conventional vacuum trucks is not a feasible or viable option. Although the people who desludge the pits and other toilet systems play an important role in the informal settlements, the public health benefit may be minimal because the sludge is normally discharged of inappropriately in open drains within or just on the
According to the Lancet (2008), as much as 200 million tonnes of human waste go untreated globally every year.

Way Forward
What to do with the waste once the toilets fill up is therefore a major constraint that many communities have to contend with in low-income urban settlements in Lusaka. This presentation, which is based on a literature review, interviews with a range of key stakeholders and surveys carried out in June 2014, is about a community based Water Trust in an informal settlement of Lusaka called Kanyama and how it is responding to the challenges of faecal sludge management in the settlement. The settlement, located just a short distance from the Lusaka Commercial Business District has a population of 250,000 people. The Kanyama Water Trust has been in existence for several years and has successfully managed and provided water services to at least 167,800 people in the old part of the settlement via water kiosks and household connections (Kateya, 2014). In the recent past, and due to the non existence of pit-emptying services in the vast settlement, where the majority depend on on-site sanitation systems, the Water Trust has started running a faecal sludge management service. The service is run with the support of the Lusaka Water and Sewerage Company and the Water and Sanitation for the Urban Poor (WSUP). The Water Trust owns two transfer stations consisting of a digester and an underground holding tank and the pit emptying services are run by a trained team of pit emptiers. The findings show that although the operations cannot presently meet the demand due to a range of challenges which include, transportation, dumping of solid waste in the latrines, frequent damage of tools, sub-standard latrines, accumulation of sand in the digester, long drying periods of the sludge (Kateya, 2014), the model has the potential to be viable and scalable.

Significance of Presentation
The significance of this presentation is that this model in Kanyama could act as an example and an inspiration to other settings within and beyond Lusaka facing similar faecal sludge management issues. Despite the dependence of residents on on-site sanitation systems in the country, there are are currently no successful faecal sludge management models. In many parts of the country water supply services are provided by community based entities with the support of commercial utilities and it is therefore possible to transfer and adapt the knowledge and experiences of the Kanyama Water Trust faecal sludge management services to these other settings. The presentation will provide more detailed information about the history of the initiative as well as information on the conditions necessary for the successful implementation of the Kanyama Water Trust faecal sludge management model as a business.

References


Social Franchising Principles Developing Microbusinesses and Improving FSM Quality and Reliability
Keywords: social franchising; faecal sludge; maintenance.

The progressive conceptual evolution of the innovative social franchising partnership approach to the routine maintenance of sanitation and water infrastructure was reported on at the FSM 2 conference in 2012. This new paper describes how the franchise partners are now implementing the approach, addressing low-technology operational issues on a significant scale. Most notably, several thousand unusable school and household toilets have already been restored to a usable condition, part of programmes now in place to ensure that these, and thousands more, will remain usable.

The approach

Social franchising is the application of commercial franchising concepts to achieve socially beneficial ends and has been identified in the health sector as an approach which can, among other things, assist in driving up the quality of service and driving down the cost.

These social partnerships are especially suitable for communities with a large poor population needing infrastructure services, but who are also looking for employment and an opportunity to develop their entrepreneurial and technical skills. Water services social franchising partnerships can broadly be described as business-to-business partnerships, whereby small locally based enterprises enter a business partnership with a larger established enterprise for the purpose of replicating an already “tried and tested” approach for undertaking selected activities. The purpose of these activities is to ensure sanitation and water facilities and systems are operating in a reliable manner and in accordance with suitable availability, hygiene and environmental standards.

As reported at FSM 2, in the pilot conducted in the Eastern Cape province of South Africa, trainee franchisees, all local people, with few exceptions first-time entrepreneurs, were helped to set up microbusinesses. Under the guidance of the franchisor, these microbusinesses, mostly employing women from nearby rural villages, undertook the initial cleaning and thereafter routine maintenance of the water and sanitation facilities at 400 schools.

This approach provides appropriate training, a quality management system and procedures, and the backup of the off-site skills held by the franchisor. The franchisor identifies people with the skills appropriate to franchisee microenterprise, who are resident in the target area and who, once they have been exposed to training, are willing to enter into a franchise agreement. Key to the success of this approach is the willingness of the public sector authority owning the infrastructure to outsource its responsibility for routine servicing, and the ability of this authority to procure, appoint and direct microbusinesses to undertake the work under the guidance of the franchisor.

Whereas other approaches have built capacity and developed skills in attempts to improve service delivery, many of these approaches have had limited success because they have not enjoyed sufficiently strong incentive structures and support systems. In contrast, the innovative and practical social franchising partnership approach to
maintenance of sanitation infrastructure is built on a robust foundation of mutual support and incentives.

The approach addresses key national goals of South Africa, particularly:

- **local level job creation**, especially at the lowest economic levels, where unemployment is highest and possession of workplace skills lowest;
- **transfer of workplace skills**;
- **building local capacity through microbusiness creation and nurturing**; and
- **service delivery**, through operation and/or maintenance activities which increase the availability and utility of infrastructure, and the quality and reliability of services.

Implementation since FSM 2

A significant element of the work thus far has been the safe on-site handling of faecal sludge. Options, using improved techniques, tools and methodologies, and for its safe disposal at approved locations and/or its beneficial utilisation are being further developed.

Within existing infrastructure types and technologies (the majority of the toilets serviced so far have been Ventilated Improved Pit Latrines (VIPs)), the footprint of the concept is already expanding, in that the Eastern Cape Department of Education has awarded a three-year contract for the routine servicing of sanitation facilities at more than 1300 schools. In addition, two of the municipalities in the area have awarded contracts for several thousand household sanitation facilities, and the first venture in another province is already under way.

The franchise started with 10 trainee franchisees. Four years later, the best of these are capable of working with minimal support from the franchisor, and are in the process of establishing their own companies, giving their businesses a more robust structure with greater credibility. The new contracts have required the recruitment and initial training of two dozen candidate franchisees.

The social franchising concept has proven very successful in incentivising a professional approach. On the one hand, restructuring the relationship between the user, client and service provider transforms an often-neglected essential service into a contracted service. On the other hand, the contract between franchisor and franchisee offers a stable relationship, as opposed to the larger entity hiring or partnering with people who simply leave if alternative employment is offered. Professionalising these services not only creates job opportunities and encourages small entrepreneurs to move into this sector, but also gives individuals a reason to take pride in having a career in sanitation that may otherwise carry the stigma of being undignified and unrewarded.

The driving force behind success is the franchisees' incentive to achieve set standards, get paid when they achieve these standards, and grow their own businesses. Reinforcing this arrangement are management systems which ensure quality control over the operations, sustainability through economically viable pricing systems, and responsible health and safety and environmental management systems. Being a successful franchisor operating at the bottom of the economic pyramid requires patience and benevolence, whilst at the same time insistence on compliance with predetermined standards. Unlike working with contractors, where there are contracts with clearcut conditions and penalties for non-performance, working with franchisees requires the franchisor to nurture and guide, and exercise patience, in
order to ensure that an environment conducive to stimulating learning and the growth of the franchisees is maintained.

Apart from providing essential operation and maintenance services to public sector authorities which are short of skills, the partnerships create jobs, provide training, and nurture microentrepreneurs. Projects must be structured so that when they come to an end, the franchisees employed on them will have been developed into sustainable microbusiness entities, with the necessary skills and sufficient workload and income streams to continue as viable and profitable businesses.

Two dozen types of infrastructure in the sanitation and water value chain requiring routine servicing which could suitably be done by microbusiness franchisees have been identified. Among them are: types of household and institutional water and sanitation facilities other than VIPs and rainwater harvesting; meters (maintenance, but also meter reading); sites (properties), e.g. municipal depots; pumps and pump stations; and water and wastewater treatment works (up to of the order of 2-4 Megalitres per day).

“Four Cards Control System” For FSM Improvement In Indonesia

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Key words: regular desludging; illegal discharging; private sector participation

In its national Mid-Term Planning, Government of Indonesia (GOI) has re-emphasized its commitment towards Universal Access for water and sanitation services by 2019. This target poses many challenges, especially in sanitation services, where its development outputs will have tremendous influence on the quality of water supply services.

One of the biggest challenges in sanitation services is to ensure safe sludge treatment, as this will become one of the main indicators of Sustainable Development Goals (50% of sludge managed safely). Access to improved wastewater facilities in 2010 were reported as 56%. With on-going improvements, intermediate values show a steady increase of these values. By the middle of 2013 access had increased beyond 58%. It is assumed that overall access will have increased to 60% by the end of 2014, predominantly septic tanks, and the challenge to ensure safe sludge management is imminent. As urgent as it can be, not all cities have the means to sludge treatment services. Some of the cities rely on the neighbouring cities for such services, thus, this is a priority issue to be dealt with.

On-site system got more attention because this is the common system applied in Indonesia, and will still be used for a long time in the future. Common issues with on-site system are:

- Septic tank is not watertight. Though there is regulation from the Central Government regarding technical standard of septic tank. It has not been followed by Local Governments (LGs). Different local agencies involved in the overall FSM management and weak coordination amongst them has created this problem;
• No regular desludging; it depends on the initiative of the customer, usually if blockage happened. The responsible local agency should take the initiative for regular desludging to realize an improved FSM;

• Illegal discharging. The common excuse is the distance of the septage treatment plant (STP) from down-town, and without proper surveillance the truck driver will be tempted to discharge it in a nearby water body.

This working paper proposes practical policies and tools addressing the safe sludge treatment issue. The methodology to develop the policy is based on the delivery system approach leading to practical policies for local government. The methodology also will enable the central and provincial government to develop umbrella regulations and standards for local governments. This working paper on safe sludge management proposes two tools:

• Tools for collecting information on septic tank quality and for database purpose; and

• Tools to safeguard the implementation of desludging and safe sludge treatment services called “the four cards control system”.

The census tool basically consists of questionnaire, guidelines for enumerators and guidelines for analysis. The local government, based on the census tool, can decide: (i) to develop a project to improve conditions of existing septic tanks and on regular desludging mechanism; (ii) to formulate supporting regulations for ensuring the implementation of regular desludging; and (iii) to develop sanitation services information system to monitor sanitation access and services improvement.

The “four cards control system” tool consists of several stages where cards will help that each stage is implement according to the standard. The most important last stage is ensuring that the sludge is being disposed in the sludge treatment plant. There are four stages on applying it as follows:

• On regular basis, the private company providing regular desludging visits the customer to empty the sludge. The truck driver receives three cards all signed by the customer while the customer keep one card signed by the truck driver for further random checking by the local government. No direct payment to the truck driver;

• The driver brings the sludge to the STP where he has to get signed on the other three cards. One card is left at the STP;

• One card will be used as an attachment of the invoice of the private company to the local agency. The company keeps one card for its records.

Other modification is by applying barcode for customer card where it contains information of the customer, and one card for the truck driver. In this case the truck driver should be equipped with barcode reader to read the barcode of the customer. When he arrives at the STP, his card will be read by the barcode reader at the STP. By this, the travel time can be measured and monitored for further improvement.

By applying this method, illegal dumping that previously often happened can be avoided. Surveillance by local agency to avoid illegal dumping is now can be transferred to the manager of the private company. The manager will need to ensure the truck driver dump the sludge at the STP; otherwise the company will receive no payment. Moreover, the private company will have to develop database of customer to be proactive visiting the customer at the set time.

The responsible institution at local government level has first to develop the program, improve customer database, prepare card for customer with barcode in it, improve its
hardware (computer, internet), and at the same time launch a program to improve septic tanks condition in accordance to the technical standard.

The use of web-based system for FSM is based on our experience in developing Reading and Billing program for Water Company. It improves customer administration where activity of the meter readers can be monitored and the data is directly stored at the local agency office. Our lesson learned is that it improves transparency but at the same time it needs the improvement of corporate culture of the local agency staffs where they should see the customer as the source of income.

The “Earth Auger”, Testing and Introducing in Latin America’s Market a New Technology on Decentralized Sanitation

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Theme: FSM as a business

Keywords: decentralized sanitation; road-to-market; scaling up

Fundación In Terris (Ecuador) and Critical Practices (USA) are developing, assessing and marketing a new ecological and decentralized sanitation technology in Latin America, the "Earth Auger", which is a urine-diverter dry toilet (UDDT), foot actuated that promote waste composting through a dry-flushing mechanism. The technology is water-less, energy-free and produces plant fertilizer.

Understanding that there are 2.5 billion people without proper sanitation (120 millions in Latin America and almost 3 million in Ecuador), less than 20% of waste water are treated before disposed in rivers and oceans, and that we are facing a water deficit of 40% for 2030, the Earth Auger could be an effective solution for rural and peri-urban areas where no water or sewage systems exist.

Currently there have been installed more than 50 units and the goal is to install 300 during 2014, for assessing acceptability, functionality and pathogen die-off. Parallel, the researching team is identifying, quantifying and characterizing the market; as well as designing and testing a competitive value chain, with the goal of launching into the market an effective and sustainable solution, which creates jobs and other environmental and social positive impacts.

The current project's phase has a 2-years schedule, from July 2013 to July 2015; then the expectation is to have a progress status of 70 - 80 % for Jan 2015 (when the FSM3 happens). It is a multidisciplinary project that plans to contribute to the event with results regarding to technology's functionality and acceptability, as well as market analysis and strategy.
Figure 1 Project strategy on the road-to-market includes not only common business work axis, but also key stakeholders approach for promoting a better legal and political framework for a novel technology.

Figure 2 Holistic approach for behavioral changes. The project demands several approaches for superstructure including installing manuals.