

**Making integrated platform for fecal sludge management in Maputo work**

<b>Country and location</b>	Maputo, Mozambique
<b>Involved partners</b>	TU Delft, Universidade Eduardo Mondlane, Erasmus University
<b>Potential partners</b>	Municipality of Maputo
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<b>Budget indication</b>	TBD

**Background/Context**

- In Maputo (Mozambique) the capacity to deal with fecal sludge (FS) collected in on-site systems (e.g. septic tanks and latrines) is very low. Inappropriate fecal sludge management (FSM) has serious consequences, leading to decreased life expectancy and environmental pollution<sup>1</sup>.
- Only 5-10% of the population is connected a sewage network in Maputo. The rest of the population uses mainly septic tanks (37%) and latrines (53%)<sup>2</sup>. These systems fill-up and need emptying, this task is performed by around 25 de-sludging operators who empty them mechanically. The FS is then brought by truck to the wastewater treatment plant in the Infulene valley. Part of the systems are also emptied by informal operators that do the work manually (e.g. buckets), and another percentage are abandoned when full. Through a survey to 1,200 households in the city, in cooperation with the World Bank, we are in the process of quantifying these proportions for Maputo.
- The sanitation sector in Maputo is caught in a vicious cycle. The wastewater treatment (WWTP) plant is not working due to lack of maintenance and is not equipped to treat FS. Since there is no discharge fee for desludging operators or user fee there are no funds to rehabilitate the WWTP, let alone expand it, to treat FS. The institutional capacity in Maputo is low, with the Municipality controlling the access to the plant only during daytime on weekdays, which is insufficient to prevent illegal discharge. These factors have led to the extensive pollution of the rivers and sea in the region of Maputo and to the contamination (Nitrate) of the groundwater<sup>3</sup> used by many of the city's inhabitants as drinking water.

**The main idea**

We aim to break the vicious cycle through introducing a fecal sludge management platform linked to a future fecal sludge treatment plant (FSTP). The platform is the mediator between the person who needs his/her on-site system emptied and the desludging operators. It generates discharge and user fees necessary for the operation of the treatment plant and the enforcement of regulation to prevent illegal discharge. In addition, it drives up the competition between de-sludging companies through competitive bidding, which is expected to lead to a reduction in de-sludging costs. The platform will operate in the following way:

1. De-sludging operators emptying septic tanks are added to the managing institution's database; for this the operators must be certified by the regulator CRA,
2. Whenever a inhabitant of neighborhood need to have their septic tanks he/she contacts the managing institution (e.g. call-center or sms) providing address, type of system, volume to be emptied and content (e.g. solid, solid and liquid, only liquid),
3. The call-center contacts all operators providing information about the job,
4. The operators interested bid and the lowest bid is selected,

<sup>1</sup> Strande, L. (2014, June). Faecal waste: the next sanitation challenge. *Water* 21, (June), 16–18.

<sup>2</sup> WSP. (2014). *Caracterização do Saneamento em Maputo* (in Portuguese). Washington (DC, USA).

<sup>3</sup> Bhatt, J. (2014). Comparison of small-scale providers' and utility performance in urban water supply: the case of Maputo, Mozambique. *Water Policy*, 16(1), 102–123. doi:10.2166/wp.2013.083

5. Once the job is done the user pays the managing institution for the job. This can be done for example one of the available mobile money services such as Mkesh or Mpesa, and
6. The managing institution retains part of the money (treatment fee), the rest is transferred to the operator. The treatment fee is regulated by CRA and it is a function of the type of job done (type of system emptied, volume, distance to the FS/WWTP, etc).

It is important to refer that only de-sludging operators added to the platform will have the right to enter the premises of the FSTP. This creates a driving force for the adoption of the platform on both sides (offer and demand), with the households wanting to use the platform because eventually they will pay less and de-sludging companies wanting to use the platform because that is the only legal way to operate.

The FSTP will be designed and built according to local conditions (volume, quality and type of influent) and aiming at revenue generation (e.g. biogas production), using low-cost and robust technologies, whenever possible sourced locally.

### **Why is this new?**

A similar platform has been implemented in Dakar, Senegal<sup>4</sup>, with increases in treated FS and a reduction in de-sludging prices being reported. This would be new for the Mozambican context that is lagging behind the innovation in the sanitation sector, in particular that of FS management and treatment. Also, for our platform we propose payments via mobile phone (Mkesh/Mpesa) which, we believe, would minimize corruption.

### **A plan on how to implement the idea**

#### Year 1

- A pilot neighborhood for the project will be selected in cooperation with our local partners.
- The platform will be developed by a local IT company with the support of TU Delft, Erasmus University and our local partners.
- The FSTP will be designed by TU Delft and built by our local partners; also the access to the plant will also be improved.
- The municipality will be trained to detect and punish illegal discharge and to adequately manage the access to the plant, including guaranteeing control over the access 7 days/week on extended daily schedule.
- The division of responsibilities will be studied and tested during the pilot. Several models are possible, including the public (e.g. Municipality) or private exploitation of the platform.

#### Year 2

- Marketing the platform and organizing education workshops for the local populations, this is expected to lead to an expansion in business volume.

#### Year 3

- Evaluation of the project and clarification of roles.

### **Why this opportunity cannot be missed**

This project solves a series of interrelated problems that cannot be solved through technology alone but require changes in policy and public awareness. The combination of a FSTP and a management platform, together with capacitation of local institutions and education of the populations will help breaking a vicious cycle in Maputo in which no fees for treatment are paid by the user and operator leaving a treatment plant in a detrimental state.

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<sup>4</sup> <http://www.susana.org/en/resources/library/details/1817>