Low cost technologies for faecal sludge management: Modular latrine, Semi mechanised pit Emptying, treatment and reuse

KAMPALA, Uganda

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Year Founded: 2013
Organization type: for profit
Project Stage: Scaling
Budget: $10,000 - $50,000
Website: http://sanihub.blogspot.com/

- Conservation
- Employment
- Environment
- Pollution
- Sanitation
- Technology
- Waste

Project Summary

Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.

The project addresses the entire faecal sludge management chain. We have developed a new modular latrine called DuraSan, (made up of durable, interlocking, precast concrete blocks), a low-cost pit emptying pump called a Rammer, primary transportation devices & Decentralized Treatment Plant.

WHAT IF - Inspiration: Write one sentence that describes a way that your project dares to ask, "WHAT IF?"

What if the next generation billionaire is a poo entrepreneur?

About Project

Problem: What problem is this project trying to address?

Over 95% of Ugandan population heavily use on site sanitation facilities with 12 waste water treatment plants of which only 3 are conventional and are overloaded. On average during rainy season, 60% of pits are always full in Kampala City. Also in Kampala about 1000m3 of faecal sludge is collectible yet approximately 200m3 is collected. Vacuum tankers don't access some areas, can't completely de-sludge and not affordable to some communities.

Solution: What is the proposed solution? Please be specific!

The DuraSan toilet provides quality sanitation. It is long-lasting, it can be deployed using a sanitation loan obtained from microfinance institutions (MFIs) (since it can readily be disassembled and removed if a client fails to pay), and it avoids the common problems of other latrines arising poor workmanship, delays by masons and over-charging. The Rammer makes it possible for full pits (both lined and unlined) in
informal settlements to be emptied in an acceptable sanitary manner. The Decentralized Faecal Sludge Treatment System (DFSTS) for treatment of faecal sludge in areas lacking treatment plants & solves the problem of long distances. The Rammer and transportation can be carried down through a narrow alley.

Impact: How does it Work

Example: Walk us through a specific example(s) of how this solution makes a difference; include its primary activities.

The DuraSan toilets is a modular structure made out of precast concrete blocks. It is cost effective, easy to install, eliminates poor workmanship of mansions and provides a good platform for customers to get it through loans. The Emptying device is locally fabricated and affordable, capable of pumping viscous sludge, easy to operate, cleaner, goes deeper into the pit and minimizes spillage of sludge. The primary transportation devices are meant to aid the movement of sludge barrels in the narrow paths of slums to a collection area for further transportation to disposal sites. Our treatment plant has all the anaerobic units made out of plastic tanks, this makes it cheap, allows recovery of energy and the biosolids for agricultural use.

Impact: What is the impact of the work to date? Also describe the projected future impact for the coming years.

The project has benefited people in different categories ranging from fabricators, contractors, entrepreneurs to Research and development engineers. The project is also contributing significantly to the public health of the area e.g the current pit entrepreneurs currently account for 4% of all sludge emptied in Kampala. The communities are now able to reuse their pits instead of previously abandoning and digging new pits. Since October 2014, we have constructed 162 DuraSan toilets in communities which has improved access to desirable sanitation facilities. DuraSan is durable and encourages emptying and reuse. We have sold the rammers to Kenya, Zambia, Mozambique, Malawi and locally. In Kitgum, Mbarara, and recently Kamwenge people have formed pit emptying businesses. During Kampala Sanitation week March 2015, we extracted 250 barrels of 250L capacity using rammer from slums.

Spread Strategies: Moving forward, what are the main strategies for scaling impact?

All rural growth centers and towns in Uganda should access these sanitation technologies i.e. the DuraSan modular latrine, pit emptying business, and low cost treatment and reuse. At full potential, we want to improve faecal sludge collection in Kampala by pit entrepreneurs to 30%. We plan to set up franchise in every region of Uganda where people can access our services. We expect over 100 people to be employed in this business, with the biggest fraction being entrepreneurs whose wages will come from the profit they make. Target is to attain full nationwide business coverage by 2020.

Sustainability

Financial Sustainability Plan: What is this solution’s plan to ensure financial sustainability?

The sale of DuraSan generates 25% profit margin. The sales of rammer also bring revenue to the business. In pit emptying, we have Pick up hiring model & Leasing model of tricyles with emptying equipment. The entrepreneurs are charged $48 per day for pick Up hire model, $1200 for tricycle lease of 6 months. DFSTS is sustained by charging a dumping fee and selling its products.

Marketplace: Who else is addressing the problem outlined here? How does the proposed project differ from these approaches?

Private cesspool emptiers and KCCA are mainly using vacuum tankers for emptying which are faced with inaccessibility and unable to desludge in-situ pit sludge. This project is unique in that it addresses challenges of latrine structures, more viscous pit latrine sludge and inaccessibility, lack of decentralised treatment systems. The demand for pit emptying services is clear, there is also an untapped market for bio fuels. Industries such as Uganda Clays currently import biofuel from Tanzania to heat their clay brick kilns. Locally captured and dried pit sludge could provide a cheaper option.

Team

Founding Story

Our upbringing in the slums in Kampala made us see the sanitation challenges many individuals face when their pit latrines got full with no space for digging new pit latrines. There are limited solutions for emptying these pits and yet households continue to use them in that state exposing them to sanitation-related disease. Given our engineering background, we came together to research and develop technologies to help our communities to improve their sanitation. Training some community members to use these technologies has created employment for them as they get paid for emptying pits making them usable again hence better sanitation. Thus people are now regarding poo as a resource and we are also exploring options for treatment and reuse.

Team

The team comprises three engineers with a passion for sanitation. We have successfully managed to combine our capabilities to solve one of the most pressing needs of our society, namely full pits in unplanned settlements. We develop technologies that are people centered and design business models for each. We construct, supervise and train fabricators of the DuraSan latrine and new entrepreneurs on operation and maintenance of the rammer.
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About Your Project
Organization Name
Water For People
How long has your organization been operating?

Supplemental

Please list your date of birth (YYYY/MM/DD)
1989/01/26

Please tell us how leadership training would help you to make an even greater impact on the social innovation field.

This training will equip me with advanced skills of introducing new technologies to the market. I expect to gain knowledge of managing and expanding these sanitation technologies to other parts of the country.

The training will instill in me a deeper understanding of how to influence behavior and change, assess project progress and success, and manage the process of identifying new young innovators / entrepreneurs to work with.

I will also learn from the experience of Ashoka fellows and possibly network with some of them who are solving the same problem as I do. All these skills will be useful when creating impact on the social innovation field.

Please enclose a short personal biography.

I was born in 1989 at Naguru Go-Down Kampala district but attended primary studies at Mukongoro Rock, Kumi district. I served as a time keeper, head monitor, discipline prefect.

In 2002 to 2007, I attended high school at Kololo Secondary School. I served in many leadership positions and in May 2007, I was selected to go to Øvrebyen Videregående Skole, Norway to discuss how to incorporate 'Entrepreneurship Education' into Secondary Academic Curriculum.

I enrolled for BSc. Agricultural Engineering at Makerere University in August 2008. I was a president for Makerere University Agricultural and BioSystems Engineering Association (MUABESA). During this time (2011/12), we rejuvenated the association by ensuring regular and timely communication, accountability as well as involving all students in key decision making. I helped MUABESA to develop a database for all Alumni containing names, contact details, place of work and a year of graduation. This has kept the department in close contact with Alumni and some have helped to give career guidance to going students.

I helped MUABESA to develop a database for all Alumni containing names, contact details, place of work and a year of graduation. This has kept the department in close contact with Alumni and some have helped to give career guidance to going students. Being a program with the least number of students, it was also hard to win any university elections but during my time in office, I managed to unite the students to work together and we eventually succeeded in getting two University hall speakers, President for College of Agricultural and Environmental Sciences (www.caes.mak.ac.ug) and President for School of Food Technology, Nutrition and BioEngineering. Similar achievements were also realized when I served as a General Secretary for Teso Students’ Development Association (TESDA). I have created networking groups on social media to keep students and alumni in close contact, and sometimes it is the best way to pass out information.

I have developed sanitation technologies that tackle most pressing issues in the community i.e., full pits and this has made me to interact with many people during design and implementation. Some of my work has made me appear on national media like television and newspapers (http://www.monitor.co.ug/Business/Prosper/Engineers-earn-by-investing-in-...). Furthermore, I have interacted with some organisations like World Vision Uganda, UMANDE trust and Practical Action in Kenya that provide sanitation services to communities and they bought the desludging pump. I’m among the twelve young engineers shortlisted for Africa Prize for Engineering Innovation http://www.raeng.org.uk/news/news-releases/2014/october/meet-twelve-of-the-hopefuls/ I have attended and made presentations on sanitation technologies like in the recent Faecal Sludge Management 3 (FSM3) Conference in Hanoi, Vietnam http://www.fsm3.org/program-at-a-glance/, Menstrual Hygiene Management, Resource Recovery and Safe Reuse at Forest Cottages Kampala (November 2014), Unicef WASH workshop at Makerere University Art Gallery (November 2014), Civil Society Organisation Conference at Hotel Africana Kampala (Celebrating East African Citizenship, June 2014), Unclogging the Blockages in Sanitation at Serena Hotel Kampala (March 2014).

I was inspired to do this research by challenges people particularly in slums faced when their pits got full. I saw a need to development of a better desludging pump that goes deeper, cleaner, minimizes contact of Sludge with operator, and requires less energy to operate with high flow rate and can be used in informal settlements. I grew up in Naguru slums and people were challenged with faecal sludge management.
I'm working so hard to see a community where no one dies or suffers from faecal sludge related disease by providing quality sanitation services at low cost.

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