



Appendix — Project Descriptions

SATO Toilet Products to keep odors in and insects out

LIXIL | Bangladesh, Ethiopia, India, Kenya, Nigeria, Rwanda, and Uganda | \$1,000,000

An innovative line of affordable plastic toilets equipped with a simple, gravity-powered self-closing trapdoor that makes pit latrine outhouses safer, more sanitary and less unpleasant will be scaled-up with new support from Grand Challenges Canada.

The products, marketed under the SATO brand of Japan's LIXIL Group Corporation, are now being used in 14 countries, with more than 1.2 million toilets installed, improving the lives of 6 million people.

With new funding, production will be scaled up to reach 15 million additional users. Across its global sanitation and hygiene activities, LIXIL aims to provide safe sanitation for 100 million additional people worldwide by the end of 2020 — a 4 percent reduction in the 2.3 billion worldwide who lack access to basic sanitation. That would represent a significant acceleration of the world's pace towards a key United Nations Sustainable Development Goal for 2030: ensure availability and sustainable management of water and sanitation for all.

Each year millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation, and hygiene. In 2015, 2.3 billion people still lacked even a basic sanitation service, and 892 million people still practiced open defecation.

First developed by LIXIL's American Standard brand, the SATO series features a weighted flap under the seat that seals itself after use. Priced from \$2 to \$10, depending on model and country, they use as little as 200 ml (less than a cup) of water - 80 percent less water than a flush toilet, put a barrier between fecal waste and people, block odors, flies and other disease vectors, and offer an effective, affordable way to mitigate the dangers and unpleasantness of typical pit latrines.

Having to defecate in the open or in a common pit latrine exposes millions of people to odors and disease. To combat this problem, LIXIL developed the SATO series of products and launched them in Bangladesh in 2013.

Now available also in Uganda, Kenya, and India, LIXIL is establishing new manufacturing sites and distribution in Nigeria, Tanzania, Ethiopia, Rwanda, South Africa, Vietnam, Indonesia, Haiti, Ghana, Malawi, and the Philippines.

“Smart partners” in the scale up effort include the Toilet Board Coalition and local non-governmental organizations.

The SATO brand products include a variety of models tailored to meet local needs and preferences. The toilets are produced locally to keep costs down and facilitate broader distribution, and are sold through local partners to create employment and entrench local operations.

A significant new addition to the SATO product line is the “V-TRAP” Toilet System, designed to improve the performance and reliability of twin pit latrines. The new products include a diverter

that enables users to alternate pits every two years. Left for two years, the waste in the closed pit decomposes into a safe fertilizer and is removed. The pit is then reopened and the other pit closed. The twin pit approach is championed by the government of India to achieve the goal of an open defecation-free India by 2019.

“SATO seeks to scale its operations and to develop the means to reach the millions of rural consumers currently living without access to safe and proper sanitation. Funding from Grand Challenges Canada will have a significant impact on our ability to achieve these goals. That funding represents a much appreciated vote of confidence in the SATO team’s innovative and technology-focused approach to sanitation solutions,” said Jin Song Montesano, Executive Officer and Senior Managing Director, LIXIL Group.

For more information, see www.SATO.LIXIL.com.

Bundled water and sanitation services for Laguna’s informal settlements

Laguna Water | Laguna, Philippines | \$873,000

With new support from Grand Challenges Canada, Laguna Water will test a sanitation business model for the Philippines’ most impoverished people using two innovative container-toilet prototypes, with aspirations to scale its sanitation services in the province of Laguna by 2018.

An estimated 25 percent of the world’s population live in informal settlements, a number expected to double by 2030. Many water and sewerage utilities around the world have difficulty serving households in these communities, such that sanitation services are rarely extended to these communities.

Laguna Water, a pioneering public-private partnership between the Provincial Government of Laguna and Manila Water Philippine Ventures, has been addressing the urgent need for sanitation services in Laguna’s informal urban communities since the expansion of their mandate in 2015. Laguna Water is the largest water service provider in the province with more than 130,000 water service connections and about 75 percent service coverage.

Laguna Water will bundle water and sanitation services, which will be financially sustained through a cross-subsidy model. The company will simultaneously test two innovative container-toilet prototypes with the goal of meeting the needs of informal communities while also working within the operating and cost parameters of the utility.

With the new funding, Laguna Water will pilot its approach with 30 households, reaching 150 people with improved sanitation, and demonstrating a sustainable model that could be replicated by other utilities around the world. If the pilot is successful, Laguna Water plans to expand the project with the aim of reaching 30,000 households.

Partnering to provide support to Laguna Water are Grand Challenges Canada, Toilet Board Coalition, LIXIL, Loowatt and Laguna’s Provincial Government led by its Governor, Hon. Ramil L. Hernandez.

Bringing reliable, safe, and sustainable sanitation to low-income urban households without toilets in Peru

X-runner | Peru | \$660,000

Thanks to new support delivered by Grand Challenges Canada, X-runner will expand its subscription sanitation services in new communities in Peru, improving the lives of 3,500 users and removing 62 tonnes of feces per month.

Preventing human contact with fecal-born contamination is a cross cutting health priority. Poorly managed toilets and toilet waste causes acute disease outbreaks like cholera, periodic illnesses like diarrhea and intestinal worms, and chronic health damages like stunting.

X-runner, the first certified Peruvian B Corporation, delivers hygienic in-home sanitation by combining a portable dry toilet, a subscription-based weekly pick-up system and high quality customer care.

X-runner's partners include Hilti Foundation, Swiss Re Foundation, and Avina Foundation.

Improving dignity, health, and the environment through clean, safe, and efficient sanitation services

Sanivation | Kenya | \$290,000

New funding from Grand Challenges Canada will enable Sanivation, a social enterprise, to scale-up its sanitation services in Naivasha, Kenya, reaching 2,500 users with its affordable, serviceable toilets.

Some 842,000 people in low- and middle-income countries die as a result of inadequate water, sanitation and hygiene each year. Better water, sanitation and hygiene could prevent the deaths of 361,000 children aged under 5 each year.

Sanivation improves sanitation by installing modern, hygienic container-based toilets in people's homes for free and charging a small monthly fee to service them. Instead of dumping the waste, Sanivation safely disposes of it by transforming it into high-performing fuel briquettes.

Sanivation's fuel briquettes are then sold to businesses like restaurants, and have earned a reputation for burning longer and with less smoke than traditional charcoal. Sanivation has sold 100 percent of the fuel briquette that has been produced, and demand outstrips supply.

With new support, Sanivation will also begin working the municipal government to build partnerships to reach even more residents.

Sanivation's partners include Toilet Board Coalition, Naivasha Municipality, the Centers for Disease Control and Prevention, and USAID.

Pivot Works: Converting the human waste of Rwanda's capital city into renewable fuel

Pivot Works | Kigali, Rwanda | \$1,000,000

Funding from Grand Challenges Canada will enable Pivot Works, a social enterprise based in Kigali, Rwanda, to prepare to scale-up its sanitation services to serve 700,000 low-income residents. Pivot Works will refine its fecal sludge conversion process and extend operations of its pit latrine emptying service city-wide, reaching a capacity to empty 12,000 pits annually.

Pivot Works factories convert human waste into renewable fuel using a three-step process. First, Pivot uses mechanical dewatering to extract solids from human waste. Pivot then dries the solid content using greenhouses and thermal dryers. The final product, Pivot Fuel, is sold to industries as a replacement for coal or other biomass.

By selling the fuel to industrial customers, Pivot Works factories generate a revenue stream that significantly offsets the cost of fecal sludge treatment for cash-strapped governments and citizens. Pivot's pit latrine emptying arm, *Pit Vidura*, offers Kigali's only safe, hygienic, and legal emptying service for low-income households. *Pit Vidura* has developed a suite of hardware and software that to make pit emptying clean, efficient and affordable.

With earlier support from Grand Challenges Canada, Pivot Works demonstrated the feasibility of its model and improved its greenhouse technology for rapidly desiccating fecal sludge in Kenya.

Pivot's smart partners include the City of Kigali, the Water and Sanitation Corporation, the Rwanda Ministry of Infrastructure, and the Bill & Melinda Gates Foundation.