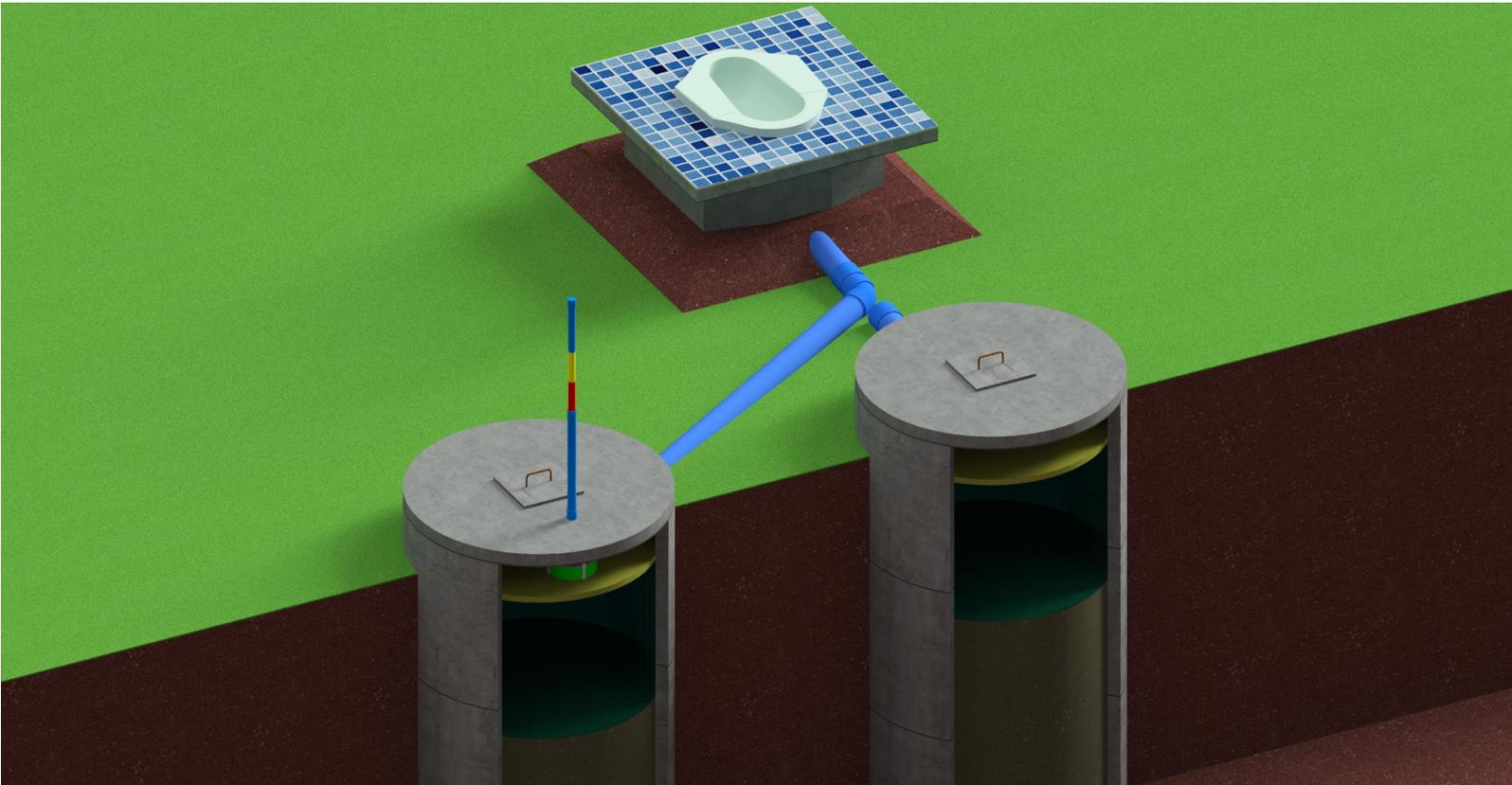


TACTIC REPORT

Addressing Fecal Sludge Management in Rural Locations



Pit latrines have become the solution for rural sanitation in many of the world's poorest, remote, and difficult to access locations. At some point in time, the pit fills. What can households in these areas do to safely manage their sanitation needs?

Context

As sanitation coverage increases across the globe, fecal sludge management (FSM) is becoming increasingly important as the next sanitation issue that needs to be addressed. Most FSM solutions are designed for urban environments and involve collection (by vacuum truck or manual emptying) and mass treatment (e.g., ponds, aerobic digesters). For rural communities and households in Cambodia, these solutions present both economic and logistical challenges. Households in some areas have been able to manage their pit emptying issues with the service of pump trucks that come directly to the household. However, these solutions are still relatively expensive, are sometimes unable to navigate rural roads, and many hand-made varieties of these trucks lack the ability to hygienically remove and transport waste. As motor-powered pumps are becoming cheaper, households are increasingly opting to use these over manual emptying with buckets. Yet despite increasing availability of pumps and trucks, waste disposal is rarely handled safely. In rural areas, the cost of constructing and maintaining a safe, hygienic treatment collection

plant is prohibitive. The economies of scale that enable mass waste treatment plants to operate sustainably in urban areas are simply not available in rural villages. Additionally, regulation and enforcement of standards that would ensure health and safety in treatment plants are currently lacking in the Cambodian context. However, rural latrine users do typically have at least one advantage over their urban counterparts: adequate space to build a second pit.



"My son is going to marry next month at my house. I need to have a new pit, as you know many people will come to my house for the wedding party. That is why I bought a new pit from the sales agent."

Mr. Mol (about 50 years old)

Background

In 2009, iDE set out to improve national sanitation coverage in Cambodia, which stood at 23% after sluggish growth of less than one percent annually for the preceding 20 years. More than ten years later, the Sanitation Marketing Scale-Up (SMSU) program is the largest of its kind globally and sanitation coverage nationwide has surpassed 70%.¹ To support and facilitate the growth of the sanitation market, iDE trained entrepreneurs to become latrine business owners (LBOs), providing them the design for the Easy Latrine, a simple affordable, attractive, pour flush pit latrine. iDE supports these entrepreneurs with demand generation by managing a team of professional sales agents. To date, iDE Cambodia's SMSU program has facilitated the sale and delivery of over 343,300 Easy Latrines to rural households, enabling over 1.6 million individuals to gain access to sanitation. As the sanitation market in Cambodia has matured, iDE has developed additional products beyond the Easy Latrine. Currently, the program is facilitating the sale, delivery, and installation of four different latrine shelter models and an alternating latrine pit upgrade.

Intervention

For an average household in Cambodia, a single pit latrine will take between two and five years to fill.² Once filled, the solution in urban areas is to vacuum pump out the fecal sludge, but this option is not always feasible for rural communities based on cost and accessibility. If the pit is emptied, in

¹ Cambodia Socio-Economic Survey. Phnom Penh: NIS; 2018

² National Fecal Sludge Management Guidelines for Rural Households. Phnom Penh: MRD; 2020

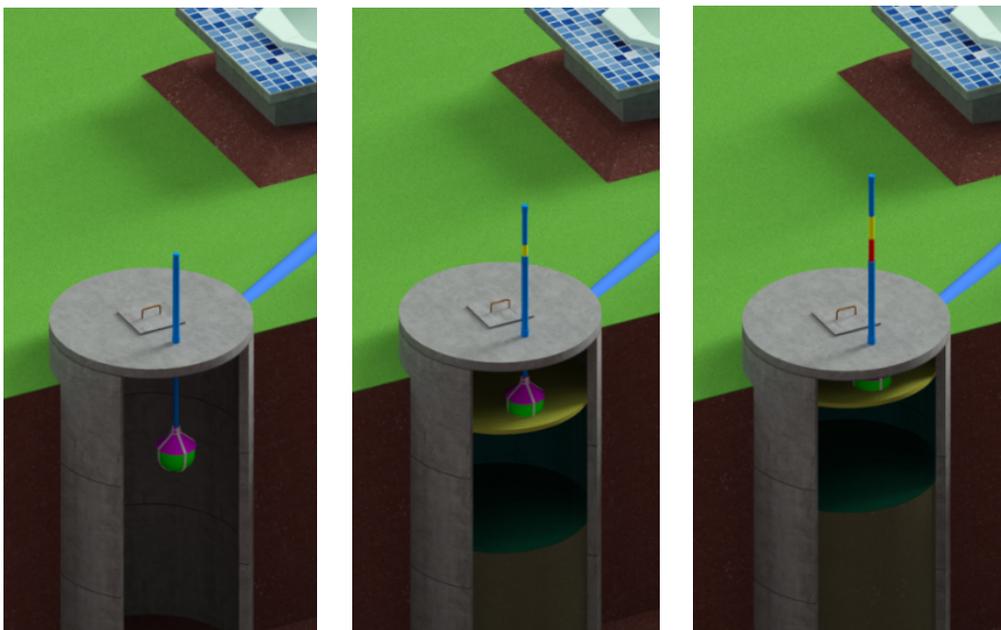
virtually all cases, the waste is handled and disposed of unsafely.³ To address this issue, in 2017 iDE began piloting sales of its Alternating Dual Pit (ADP) product, which is essentially an extra pit to which the pan can be diverted. The second pit increases the household's capacity to deal with waste, effectively doubling their sanitary waste storage. Switching to the new pit allows the fecal sludge in the old pit to decompose, drying over time and reducing exposure to fresh excreta. Dried sludge that has been left in an undisturbed pit for two years should be relatively safe to handle (although care should still be taken to minimize contact).⁴ This dried sludge is not hazardous to the environment, and can safely be used for agricultural purposes to add humus and fiber to the soil, promoting plant growth.

Some variations of similar, twin-pit latrines in the rural sanitation sector have included a junction box with a valve switch to enable households to manually switch connections back and forth between pits every time one fills. However, in iDE's experience across its portfolio, this type of junction box, which is typically left unused for years, is often jammed and unmovable by the time that households need to switch their connection. With this in mind, iDE made the decision to de-engineer the product to its most basic level. Rather than install a junction box, the installer will simply cut the PVC pipe connection between the latrine pan and original pit, then fit a connection to the new pit. This modification significantly reduces the price compared to the junction box design.

Considering the need for reconnection is limited to once every three to five years on estimate, iDE believes that customers will be willing to absorb the extra occasional labor cost of contracting out this service. With an ADP, customers can theoretically alternate pits back and forth and safely empty stabilized waste sustainably well into the future.

Key Innovations

The Pit Gauge: A nudge towards FSM behavior change



³ Household Pit Emptying and Sludge Reuse Practices in Rural Cambodia. Phnom Penh: Long D; PSI/World Bank; 2018.

⁴ Guidelines on sanitation and health. Geneva: World Health Organization; 2018. License: CC BY-NC-SA 3.0 IGO.

During the ADP pilot iDE developed and tested the Pit Gauge product to attempt to trigger households to buy an ADP. The research yielded qualitative indications that the Pit Gauge helped to increase ADP sales but the quantitative assessment was inconclusive. The Pit Gauge functions like a visual alarm clock, signaling to households when their pit level is approaching its capacity. The blue section rises when the pit contents have reached the topmost ring. When the ring is about half full, the yellow section, designed to catch the household's attention, becomes visible. By the time the top ring has reached its last quarter of capacity, the red color, signaling urgency or danger, becomes visible.

By drawing the household's attention to its latrine pit contents in a conspicuous way, iDE's intention is for the Pit Gauge to nudge the household to start considering FSM options before it's an emergency. Additionally, a visible red band on a household's Pit Gauge could serve as a signal for sales agents to more effectively identify households in need of FSM solutions. To date, over 9,100 Pit Gauges have been sold and delivered with the ADP product.

Hydrated Lime: On-site pit treatment to reduce emptying risk

When iDE-affiliated business owners install an ADP, they first treat the old pit by mixing in hydrated lime. Research iDE and others have conducted on hydrated lime in 2015 indicated that, if effectively mixed into sludge, this can significantly reduce pathogens and improve the agricultural benefit of human waste.⁵ To ensure that this mixing is taking place, iDE requires each affiliated business owner who installs an ADP to own a motorized, handheld digging machine with a rotating auger blade. This machine can be used to make the initial digging process easier then is used to mix the hydrated lime into the old latrine pit. After the old pit is treated, the blade is cleaned and sanitized, the pit lid is sealed, and the new pit is connected to the latrine pan.



Transitioning construction businesses to sanitation businesses

When iDE began its sanitation marketing work in 2009, the first step was identifying market actors who could manufacture and install latrines for rural customers. Because the Easy Latrine was based on the standard concrete rings that had been used for years for irrigation and water storage, existing concrete producers became the natural choice to receive latrine manufacturing training and assistance.

In 2017, for the first time since iDE's program began, LBOs reported a reduction in income from latrine sales. The shrinking profit from first-time latrine sales is due in large part to market

⁵ Faecal Sludge Management: Systems Approach for Implementation and Operation. London: Strande L., Ronteltap M., Brdjanovic D.; 2014; Household-level application of hydrated lime for on-site treatment and agricultural use of latrine sludge. Hanoi: Chakraborty I., Capito M., Jacks C., Pringle R.; 2014.

saturation as latrine coverage rates get closer to 100%. For some LBOs, latrines make up as much as 80-90% of their overall profit, so a decline in sales is sharply felt. However, this business pressure appears to be nudging some LBOs towards adopting a new sanitation solver mindset. Indeed, iDE has seen that its network of affiliated LBOs has been generally enthusiastic about expanding sanitation offerings to products like the ADP as they are increasingly faced with the Easy Latrine's declining profit potential.

While many of these entrepreneurs have been happy to expand their business model, many continue to see their role as primarily construction. One of the challenges in upgrading an existing latrine to an ADP is that it requires the existing pipe between the latrine pan and pit to be cut and the first pit sealed. Invariably, this means that workers have to deal with feces and urine that may



remain in the pipe or seep out from the pit (especially if the pit has already started to overflow). Resistance to this type of work initially led to a higher than normal rate of turnover among latrine businesses. Recognizing this issue, iDE put a high degree of attention towards improving the installation process to reduce contact with pit contents. For example, one of the first parts of the process is to drain water that may be under pressure inside the pit to avoid spraying or fast leakage

when the connection pipe is cut. The pit is drained by making a small puncture in the old pit and allowing excess fluid to drain through a trench that leads into the hole dug for the new pit. The toilet is then flushed several times to wash the inside of the connection pipe before cutting.

These types of user-centered modifications to the installation process reduce the risk and general disgust associated with the installation of an ADP. In addition to installation and design improvements, iDE has also increased support for businesses on ways to increase staff retention, provide workers with adequate protective clothing and equipment, and better follow the installation protocol. This support has nullified the increase in LBO staff turnover that the program witnessed when the ADP product was first introduced to these businesses.

Implementation and Impact: 2017-2020

iDE's sales team sells the ADP with a combination of group sales presentations and direct sales presentations. Group sales presentations are done first to get the community together, flag the problem as a community issue, and make a first advocacy push. Sales agents then go around the village and conduct door-to-door, direct sales presentations. Often sales agents will visit households that were at the group presentations but did not buy. Sales presentations focus on evoking a sense of immediate danger from overflowing latrine pits, both for the household and the community. Sales agents regularly use themes like keeping your family and neighbors safe from "merok," the term used to describe things that make you ill. During the COVID-19 pandemic, iDE temporarily stopped all field operations including all group and direct sales. When field operations eventually restarted, direct sales visits resumed with strict social distancing and mask use. iDE expects to re-introduce group sales presentations only when the pandemic has completely abated in Cambodia.

Throughout the pilot, between December 2017 and May 2018, three iDE-affiliated LBOs delivered 158 ADPs in Meun Chey Commune, Romduol District, Svay Rieng Province. In October 2018, after revising the product and installation process based on pilot learnings, iDE began to scale the ADP product within its five main operating provinces: Siem Reap, Kampong Thom, Kandal, Prey Veng, and Svay Rieng. As of the beginning of May 2020, 46 LBOs have delivered a total of 9,249 ADPs.

DEFINITIONS

ADP — Alternating Dual Pit. Also known as an alternating twin pit offset latrine design. When sold by iDE, includes a service component of hydrated lime treatment of old pit.

LBO — latrine business owner. Independent entrepreneurs with the technical capacity to manufacture simple latrine components (e.g., concrete rings) and procure other supplies (e.g., PVC pipes, latrine pans) and install latrines and shelters.

FSM — fecal sludge management. The hygienic collection and treatment of human feces.

iDE Cambodia

Phone: (+855) 23 223 541

Email: cambodia@ideglobal.org

Tyler Kozole

Innovation Manager, iDE Cambodia WASH

iDE Global WASH Initiative

E-mail: wash@ideglobal.org



SANITATION MARKETING SCALE-UP (SMSU)



Read more at washmarkets.idelgobal.org, a repository of iDE's learnings about water, sanitation, and hygiene for development professionals.