

# Health Impact and Effectiveness of Distribution Models for Plastic Latrine Slabs in Kenya

## Background and Context

Lack of sanitation is a huge development challenge in Kenya, but also a potentially sizeable market opportunity. The country benefits from good market infrastructure and strong local entrepreneurship, as well as a Government that is supportive and experienced with public-private collaboration. These factors lay the necessary groundwork to catalyze Kenya's consumer market for sanitation.

The World Bank and IFCs "Selling Sanitation" project worked with large plastics manufacturing firms in Nairobi to design, test, and support market development and distribution of a range of plastic latrine slabs. The products were designed from the consumer's perspective using the Human-Centred Design approach and priced well below the cost of the prevailing concrete slab. Durable plastic slabs are easy to clean, cheap to transport, and incorporate design features such as a foot-operated cover to keep flies out and odors in. The innovation has the potential to move millions of poor households in Kenya "up the sanitation ladder" and derive the health benefits of improved sanitation for marginal additional cost.



Plastic latrine slab with cover

Source: International Finance Corporation.

An impact evaluation was designed to learn whether

1. niche distribution and financing mechanisms for the plastic latrine slabs are effective for reaching base-of-the-pyramid (BOP) households; and
2. use of plastic slabs leads to health impacts in children under five.

This brief summarizes baseline findings from the impact evaluation survey and progress of the interventions.

### Intervention Study Arms

The evaluation was designed as a cluster randomized controlled trial with random assignment at village (cluster) level to test the effectiveness of the distribution and financing mechanisms, and the health effects of the slabs. The research is carried out in rural areas of the counties of Busia and Nyeri.

One study arm (Group 1) is designed to test the effectiveness of using Community Based Organizations (CBOs) including grassroots savings and investment groups, linked with a microfinance institution (MFI), to market and distribute plastic slabs to poor, rural households. The project identified and linked CBOs with the Ecumenical Church Loan Fund (ECLOF) MFI.

CBOs in each of the Group 1 villages participated in a half-day training workshop on the sanitation campaign, product attributes and benefits of the plastic slab, an installation demonstration, guidance on what support may be needed for installation, how to access the slab through the MFI or manufacture and financing options available. Key players such as ECLOF, Plastics Manufacturers, CHVs and Fundis (*local artisans* for pit digging and installation) attended the training so that direct linkages and support channels could be set up between them and the CBOs.

After the training, participants received monthly text message reminders for a period of 6 months, which reinforced the sanitation campaign messages as well messages providing contact details for the MFI (ECLOF) and manufacturers. This was to further strengthen the linkage between group 1 participants and the MFI/manufacturer to facilitate access and financing.

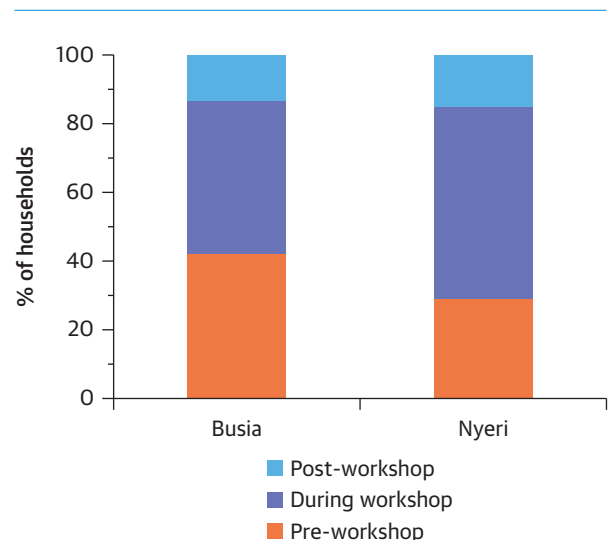
A second study arm (Group 2) is designed to test the health impacts of the slab. Households in this arm are provided the slab together with installation instructions. The households are expected to have the slabs installed over the existing unimproved pit latrine floors.

A field monitoring exercise however, found out that the installation coverage was less than 50% two months down the line for both counties. In addition majority of the slabs were improperly installed. Either the latrine floor had cracks, obstacles in the apertures or the slab was not level with ground for proper drainage. Households said they lacked the technical know-how to properly install the slab, or they did not have enough money to pay a *fundi*.

To ensure the levels of intervention take-up needed to test the health impact of the slabs, a separate installation acceleration workshop was conducted in all Group 2 villages in October 2015. Working through the Ministry of Health, local *fundis* were identified, trained on slab installation, and provided a list of households to visit. The project financed labor and materials needed for installation. Figure 1 shows the progress of installation before and after the installation acceleration campaign.

Sixty percent of slabs were installed by *fundis*, most of these during the installation acceleration workshop. Slabs installed by *fundis* were more likely to be installed correctly (i.e., no cracks on the floor (73.8%) and slab level with ground (90.8%).

**FIGURE 1. Slab installation (before, during, and after Workshop)**



A third arm serves as control for both the distribution arm and the health arm, where slabs are available to consumers under a “business as usual” model, utilizing manufacturers existing channels.

All study arms, including the control arm, were exposed to the “My Toilet My Dignity” National Improved Sanitation Campaign, which included:



- *Training* of Community Health Volunteers (CHVs) and Public Health Officers on sanitation promotional messages and tools to conduct face-to-face household visits and host small group sessions.

- *Radio drama series* and information spots over 5 weeks that incorporated lively messages about sanitation.
- *Roadshows* targeting large population centers in each sub-county to reinforce messages in a fun and engaging way.
- *Poster* placement and wall branding.

### Baseline Survey Findings

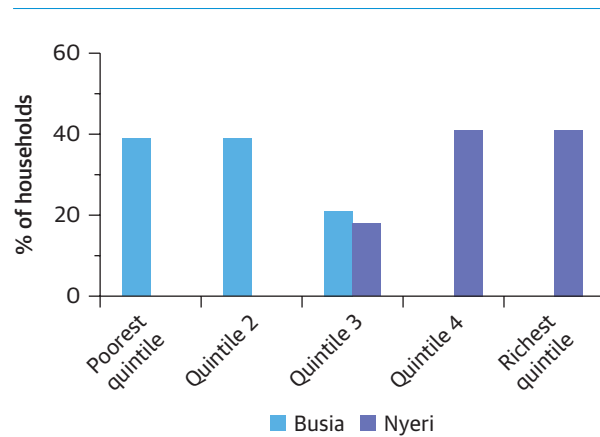
A baseline survey for the impact evaluation was conducted between November 2014 and March 2015 to characterize the study population and establish balance between the treatment arms.

Overall, the baseline confirmed balance between the treatment arms, which is important to ensure integrity of the research design.

There were stark differences between households in Nyeri and Busia. Households in Busia were concentrated in the bottom three wealth quintiles, while those in Nyeri were in the top two wealth quintiles (Figure 2).

Households in Nyeri were smaller, had more rooms, and fewer children compared to Busia. Household heads in Nyeri were also more likely to speak English and 37% had some secondary education (compared with just 17% in Busia).

**FIGURE 2. Wealth Distribution for Busia and Nyeri**



Additional indicators demonstrate the impoverished conditions of households in both counties. Nearly all households in Busia had earthen floors (93%), while in Nyeri 20% had concrete floors and 79% had earthen floors. Just 1% of households in Busia had electricity compared with 28% in Nyeri. Seventy-six percent of households had a radio (69% in Busia and 84% in Nyeri). Households in both counties had been exposed to plastic consumer products with 70% in busia and 86% in Nyeri owning a plastic water tank.

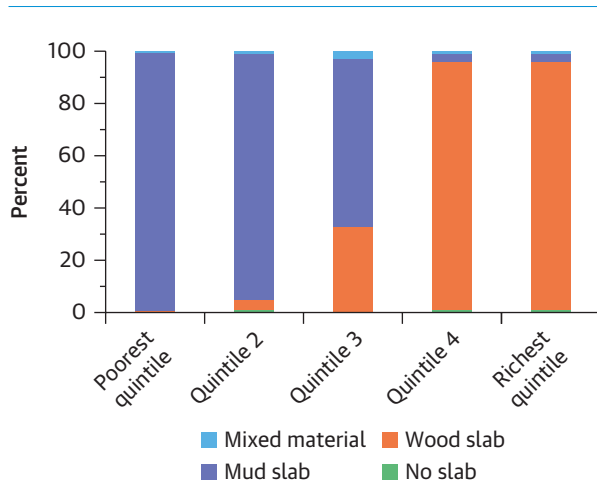
### Water, Sanitation, and Hygiene

#### Households live in poor sanitation and environmental hygiene conditions

The majority of latrines were unimproved pit latrines with either mud slab (49%), followed by a wood slab (43%). Poorer households were most likely to have mud slab, while richer households had a wood slab (Figure 3). Latrines in Busia had mud slab (90%), while wood slabs were most common in Nyeri (83%). Forty-one percent of households report using a shared latrine.

While only 8% of households reported that members of their own household defecate in the open, 44% of households reported that members of the community do so, even if they have a latrine at home. Nearly half of children between 2 and 5 years of age reportedly

**FIGURE 3. Slab Material by Wealth Quintile**



defecate in the open (46%). The average age of first latrine use was 3.3 years.

Twenty percent of households had access to piped water and 39% had access to a protected water source.

Only 4% of households had a place to wash hands near the latrine—6% of these had water available and just 1% had soap. Overall environmental hygiene conditions are poor. Eighty-four percent of households had animals or livestock observed in the living area around the house, feces were observed in 28% of household plots and the average fly count was 5.95 flies.

**Children suffer gastrointestinal upsets at high rates, and many are underweight, but worm infections are rare.**

Thirteen percent of children under 5 had diarrhea in the week before the survey. Although the survey did not collect two-week diarrhea prevalence, these estimates suggest two-week prevalence of 26%. Severe diarrhea (dysentery) in the past week was reported in 4% of children. Seventeen percent of children were underweight at baseline, with an average weight-for-age z-score of  $-0.75$  kg. The study tested for helminth infection at baseline in Nyeri county, but this was very uncommon.

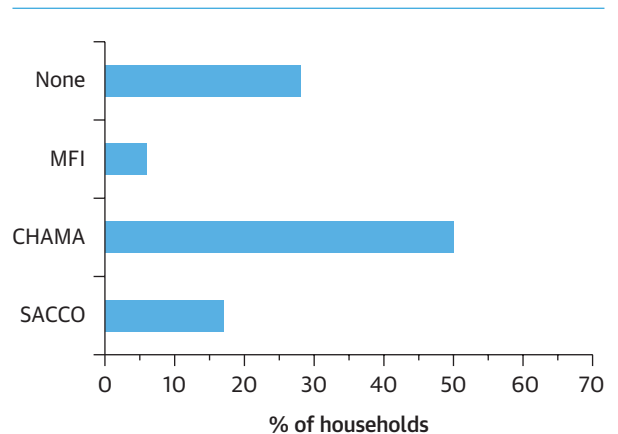
Households primarily access financial services through informal savings and investments groups, as opposed to formal banking or through MFIs.

Around 50% of households reported being current members of grassroots investment groups, known as CHAMAs, while 17% are members of savings and credit cooperatives (SACCOs). Only 6% were members of MFIs (Figure 4) and 28% had never been a member of any of these groups.

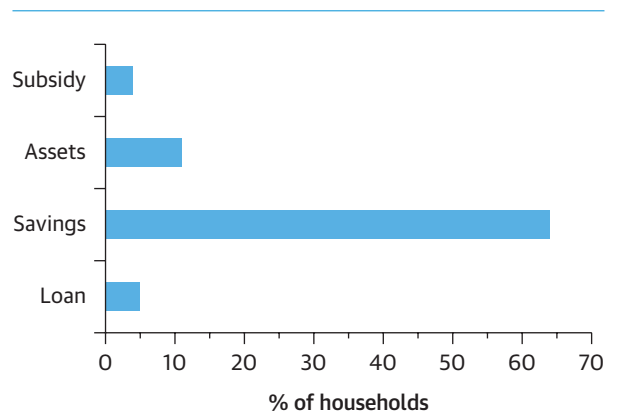
**Despite high levels of membership in financial intermediaries, most households report using their own savings to improve their sanitation.**

As shown in Figure 5, most households (64%) reported using their own savings to install their current latrine. Only 5% took out a loan and 11% sold assets.

**FIGURE 4. Financial Group Membership**



**FIGURE 5. Resources for Installing Latrine**







Training of village community-based organizations on product attributes, benefits of the plastic slab, and instructions on proper installation  
Source: Aquaya Institute.

Respondents were asked whether they would be willing to pay for the plastic slab, by being told a random offer price between 1800 and 2300 KES. An average of 69% said they would be willing to pay the price offered. However, when the option was provided to pay for the slab in installments rather than lump sum, a higher proportion said they would be willing to pay.

### **Preliminary findings from monitoring visits and follow-up on Group 1 and Group 2 participants**

#### **Effectiveness of Distribution Models Arm (Group 1)**

CBOs and self-help groups that participated in the Group 1 village trainings on the plastic slab were

periodically monitored through phone interviews to monitor sales and slab adoption by target households.

As of the last of these follow-ups in June 2016 adoption of the plastic slab has been slow. CBOs and CHVs report the main barriers to be the increasingly higher cost of the slab, unwillingness of members to borrow from the MFI for sanitation, other household competing priorities, lack of marketing or follow-up by the manufacturers and MFI, and limited availability of the product in local retail outlets.

**Participants perceive the slab as unaffordable for the target beneficiaries.**

Although plastic slabs are cheaper than the median costs of all other available slab types, many participants

### BOX 1. How Sanitation Financing Products Compare with Existing Microfinance Products

Among the most popular lending projects in the study sites is the 1-acre fund, a USAID project which finances farm inputs. These products are specifically designed for poor borrowers. Borrowers take loans in the form of farm inputs and pay over time for these inputs. Prior to receiving the loan, borrowers must participate in training on farming skills.

1-acre fund follows-up with borrowers over the life of the loan to ensure that farmers plant at the right time and use correct farming skills.

"There is no specific minimum deposit amount required and repayments are not fixed. Instead, farmers are given a deadline by which to pay (usually the month when the harvest is due). If farmers are unable to meet the deadline their harvests are sold off to recover the loans. However, if the harvests are poor due to natural calamities, the farmers are not penalized, but instead provided with new farm inputs to plant for the next season."—*Busia participant*

Sanitation loans through ECLOF have more stringent requirements, and are not well suited to the income level of the target group. For example, loans are only made to groups, who must first register with ECLOF with a KES 500 registration fee per member. Groups must also hold weekly meetings and collect weekly savings of a minimum of KES 200 per member for 3-5 weeks before qualifying for a loan. (*Information is provided by ECLOF officers during the CBO trainings*).

think the slabs are too costly and not a viable commercial business, especially as this is a new product on the market. Since introduction, the retail cost of the slab marketed by one of the manufacturers (SilAfrica) has increased in price by 53% (currently KES 3,300 for the large collar slab).

At this price point, beneficiaries require some form of financial support to afford to purchase a slab right away, or an incentive to save over time. However, households have been reluctant to use the MFI due to lack of trust, loan requirements perceived as inflexible (see Box 1), and low priority for borrowing for non-productive investments.

In Busia, where experience with MFIs is still in its early stages, respondents expressed concern that ECLOF was not well established. They preferred taking loans with institutions with a larger presence in the region, such as Kenya Women Finance Trust (KWFT) and Equity bank.

In Nyeri, participants are willing to take on loans for similar amounts, but only for productive purposes such as agriculture and business. Many participants in both counties already have outstanding loans or competing priorities such as school fees, repayments of other loans and as a result are less willing to take on additional debt.

Moreover, a preference for saving as opposed to borrowing for sanitation improvement results in a slow adoption rate and may underestimate actual demand as sales have not yet taken place. Several of the groups contacted report either individual or group savings projects underway.

**A lack of adequate follow-up and marketing from the manufacturer and MFI is perceived as a big obstacle to generating demand for the plastic slab.**

After the first monitoring exercise of this group in February 2016, it was discovered that participants

lacked contact information for both the manufacturer (SILAFRICA) and the microfinance partner (ECLOF) that would enable them to seek more information on accessing and financing of the slabs. Additional messages with ECLOF and SILAFRICA contact information were developed and disseminated through the SMS campaign. Group members were also discouraged that neither SilAfrica nor ECLOF representatives had made any attempts to follow up with them.

**Another barrier to adoption of the slab is limited availability of the product in remote, rural villages.**

CHVs and member organizations reported they either did not know where to find the slab locally, or were able to name only one or two stock lists in larger town centers. Additionally, CHVs and CBOs do not themselves have the plastic slab in their home, and they were not provided with a sample slab, both of which may affect their ability to market the product to group members and community members.

### Health Impact Arm (Group 2)

**Households overwhelmingly provide positive feedback on the plastic slab, citing its ease of cleaning, safety for children, and prestige as the main benefits.**

Ninety-three percent of follow-up respondents (N = 65) say family members feel safe and comfortable using the slab. Usage rates are high, with 94% of households (N = 65) reporting that the toilet is used by all family members.

**Despite the fact that households report a major benefit of the slab to be its ease of cleaning, poor maintenance and cleanliness are potential challenges that could mediate health benefits of the slab.**

The majority of the households visited reported that they clean their latrine between 2-3 times per week (46%; N = 65), and most use just water to do so. Presence of feces and bad smell from the latrine were

the main indicators cleanliness. Busia had slightly cleaner toilets (53%; N = 38) compared with Nyeri (48%; N = 22).

### Next Steps and Recommendations

Despite evidence which points to low sales volume, it is important to compare the experience of the plastic slab to that of similar products developed and marketed to BOP households.

For instance, the Lighting Africa project, which sells solar lanterns to BOP consumers in Kenya through similar financial intermediaries, tracked low sales in the initial years of the project, but these increased four-fold by the fourth year. As a point of comparison, the plastic slab is only in its second year since introduction in April of 2015.

A key take-away from the Lighting Africa project has been to focus on addressing bottlenecks and building an enabling ecosystem in the early stages that can sustain demand once it matures.

The MFI (ECLOF) reported increased uptake of loans for other water, sanitation, and hygiene activities and products such as latrine upgrading and plastic water tanks since the introduction of the National sanitation campaign intervention. Given time, similar demand creation interventions would perhaps increase the uptake of the plastic latrine slabs.

Additional public sector resources will be needed to further support the development of distribution channels and financing mechanisms to reduce the price for BOP households. Some of the key recommendations from the research at this stage are the following:

- ✓ Manufacturers and MFIs should take a greater role in information dissemination and marketing, especially face-to-face interaction to build trust.
- ✓ MFIs may need to consider more flexible lending product design for the consumer segment, such as allowing variable repayment options.

- ✓ Participants need to experience the plastic slab first-hand. One approach is to provide CBOs and CHVs with sample slabs for demonstration purposes.
- ✓ Manufacturers and MFIs may consider introducing monetary or non-monetary incentives to motivate providers to market and sell the plastic slabs.

A follow-up survey will be conducted between October and November 2016 to estimate the health and nutrition impact and cost-effectiveness of the plastic slab. In Group 1 villages the follow-up evaluation will focus on gathering qualitative data to assess the main barriers to adoption.