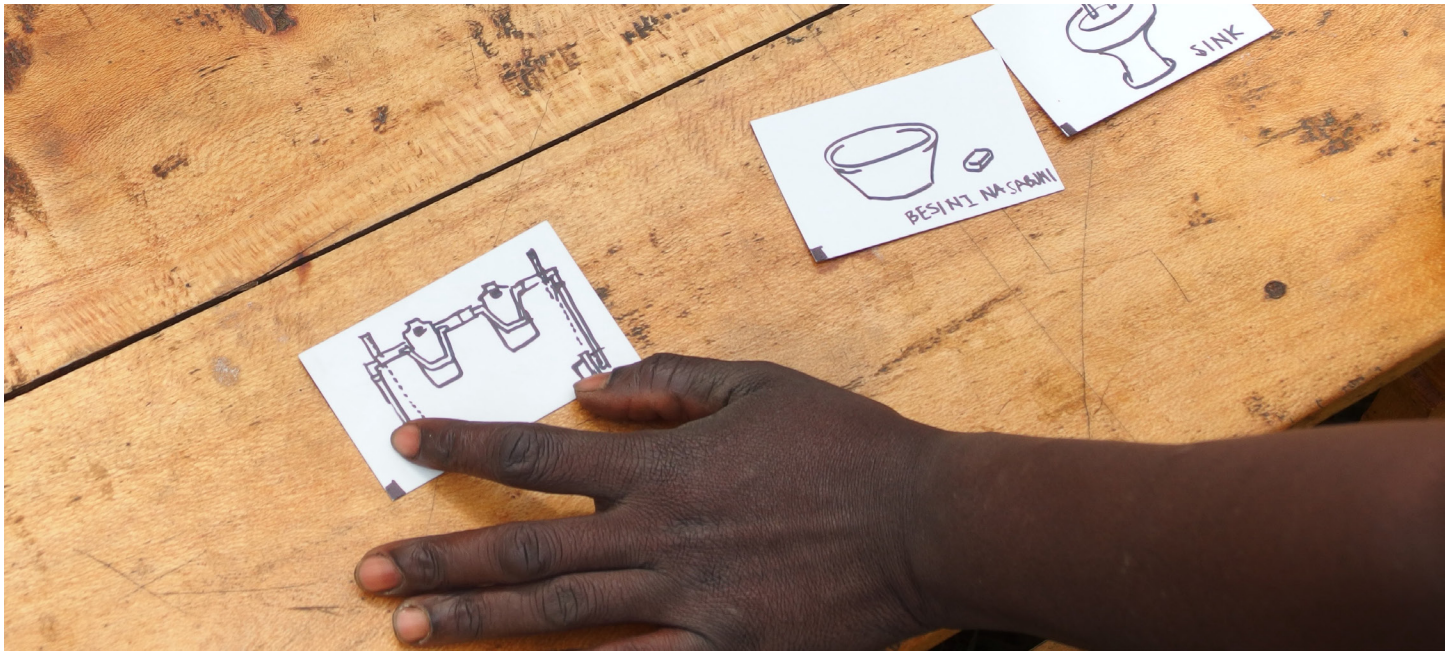

A member of a focus group in Kisumu, Kenya, provides user preference input for a handwashing station customized for areas without access to piped water. Photo credit: Noel Wilson

A Better Way to Wash Hands Without Piped Water: Designing the Povu Poa

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The theme of this year's Global Handwashing Day on October 15, 2016, is "Make Handwashing a Habit!" In places without access to piped water, new products and technologies are needed to make handwashing with soap convenient enough to become a habit. Handwashing with soap is a powerful weapon against diarrhea and respiratory illness, the leading causes of death among children under 5. It is estimated that handwashing with soap could save 1 million lives annually. Unfortunately, only 19 percent of the global population wash their hands with soap after contact with feces.

Without access to water on tap in the home, handwashing is inconvenient — using one hand to pour water over the other is awkward and requires more water than washing two hands together. Moreover, if everyone followed the standard recommendations about how often to wash their hands (after defecation, before cooking,

before eating), women and children would likely have to spend more time fetching water from sources outside the home. Soap is another challenge — if left at locations where handwashing would ideally occur (near latrines, cooking areas, and eating areas), it is vulnerable to being wasted by children or stolen.

We set out to design a water- and soap-conserving handwashing system that could address the barriers faced by millions of people who don't have access to piped water in their homes. We wanted it to be adaptable for a variety of contexts, ranging from space-constrained urban dwellings to schools with hundreds of students. For plastics manufacturers to produce it, the system needed to be a desirable product that consumers would want to buy. Our goal was to seed the market with a good idea and then let the private sector take over.

From Boring Bar Soap to "Cool Foam"

With funding from the USAID Global Development Lab's Development Innovation Ventures program, our team of researchers from Innovations for Poverty Action partnered with engineers from Catapult Design to invent an innovative, appealing, and practical new handwashing station in Kenya. Using a human-centered design process, we started by holding focus groups and tinkering around with available handwashing products — buckets, pitchers, and tanks with taps — trying to locate features that would create value for a handwashing product. We watched people wash their hands using different types of handwashing stations and soap, interviewed them about their experiences, and engaged them in games and activities to reveal preferences that they might not have thought to explain.

We then brainstormed a large number of new concepts for handwashing products. We focused on water-frugal devices and soapy foam dispensers rather than regular soap or soapy water. We invited households to test out our models, lining up multiple options of water and soap dispensers side by side so we could see how users interacted with them and hear their opinions.

After several months of this exploratory and iterative design phase, we honed in on several key user design preferences: soap security, affordability, and adaptability. Ultimately we developed what is now branded as the Povu Poa, or "cool foam" in Swahili. The product comes in a pipe model, which can be hung from a tree or nail in a wall and is very portable. There is also a bucket model, which captures the runoff and has a larger capacity but is more cumbersome to move around. Both models incorporate a water-frugal swing tap that allows only a small amount of water to flow and a foaming soap dispenser. The dispenser transforms 5 grams of powdered soap and 250 milliliters of water into 100 handwashes, and both systems can be locked into place to reduce theft.

Importantly, the Povu Poa reduces the everyday cost of handwashing by more than half compared to conventional systems because of its exceptional soap and water efficiency. In Kenya, the cost of soap and water is only $0.10 per 100 handwashes using widely available powdered laundry detergent to make the foam. The Povu Poa is also adaptable to institutional settings; for example, the pipe model can be connected to large tanks for higher water storage capacity.

Prospects for Scale-Up

To understand the price that Kenyan households are willing and able to pay for the Povu Poa, we marketed and offered the products for sale to 200 households at varying price points. We also contracted a local Kenyan firm to create a logo and messaging for marketing the Povu Poa. We found that 78 percent of households bought the product at a price of $4, while approximately one-third (35 percent) bought it at $8. When offered side-by-side, the bucket model was more popular than the pipe, perhaps because it has a more familiar appearance or because it has a larger capacity.

Interestingly, among consumers who were only offered the pipe model, sales were almost identical to the bucket model and there is evidence that suggests some consumers would purchase the soap foamer alone. Even though the current estimated price point of a mass-produced Povu Poa is slightly higher at $12, we were very encouraged to see this real demand for a convenient and efficient handwashing system in Kenya. Notably, the Povu Poa could pay for itself with soap and water savings in 2.5 years for a family of five.

Currently, the Povu Poa is being field tested in 30 schools and health clinics in peri-urban Kenya to see if the product can increase handwashing rates among students, teachers, doctors, and nurses. We will use these longer-term evaluations to refine the product design and continue mass production discussions with plastic manufacturers in Africa.

"Foam is exciting," said one head teacher, capturing a typical user reaction to the Povu Poa system. "It won't be wasted."

By Amy Pickering (Stanford University) and Clair Null (Mathematica Policy Research), co-principal investigators of the Povu Poa Project in Kenya

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Additional Resources:

- USAID/Kenya
- Povu Poa

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