Wish for WASH +
Global Growers
2016-2017 Learning Report
Ventilated Improved Pit Latrine
Decatur, Georgia, USA
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Acknowledgments
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Disclaimer: This is a narrative and experience based learning report that exists as a piece of gray literature rather than as an academic piece of rigorous research.
Problem Statement
Global Growers Network connects international farmers, especially individuals who came to Georgia as refugees and immigrants, to land, education, and markets in order to increase the number of food producers who create access to healthy, sustainably grown food while providing farmers with greater economic opportunities. Wish for WASH (W4W) worked with Global Growers in one of their gardens, the Decatur Kitchen Garden, for the duration of this project between 2016-2017. Located in Decatur, GA, this site has plots for about thirty families on about two acres of land.

Since the garden was established in 2015, the farmers and volunteers have not had reliable access to a toilet nearby. Volunteers and gardeners can spend hours at a time on the site and may choose to relieve themselves in the surrounding woods rather than search for a sanitary and ecologically-friendly option. In need of a user and environmentally friendly toilet facility, the Global Growers Network partnered with Wish for WASH, a sanitation startup based out of Georgia Tech and in collaboration with Engineers Without Borders, due to the organizations previous experience developing toilets in and for resource constrained settings.

Design Concept
The design concept for this project consists of two key features: a ventilation improved pit (VIP) latrine and the SafiChoo toilet system. The VIP latrine is a pit latrine with a vent pipe fitted to the pit and a screen at the top outlet of the pipe. VIP latrines are an improvement to overcome the disadvantages of simple pit latrines, for example, unpleasant odors and flies. The smell is carried upwards by the chimney effect, and flies are prevented from leaving the pit and spreading disease. (More information about VIP latrines can be found here: https://www.sswm.info/content/single-ventilated-improved-pit-vip). W4W’s SafiChoo toilet system enables users to both sit and squat for improved comfort, ergonomics, and health. Squatting is preferred in public facilities, but a sitting option encourages greater use of the sanitation service by people of all ages and abilities.

Design Solution
The design solution is composed of the latrine shelter, the above-ground waste collection container, the SafiChoo toilet system, a hand-washing unit, and the ventilation pipe.

Latrine Shelter:
The latrine shelter is a 6’x6’x8.5’ structure built mainly from wood and sheet metal (Figure 1). It is a simple outhouse design with stairs that lead up to a platform with a wooden swing door and four walls with the toilet seat inside making up the majority of the room inside the shelter. The four walls and floor are made of wood. The peaked roof is made of sheet metal. Space was added between the two sheets on either side of the roof to let light into the structure. Wooden steps lead up to the door with wooden reinforcements in the back and a sliding lock on the inside. The door has a padlock on the outside and a lock on the inside with handles on either side of the door. Possible improvements include a small, additional battery-operated light source, but adding more light sources could affect how the VIP latrine uses the ventilation pipe as
the only light source in order to have a way to keep insects away from users of the toilet.

**Waste Collection Container:**
The waste collection system implemented in the design consisted of a 330 gallon intermediate bulk container (IBC) tote tank made of high-density polyethylene (Figure 2). These containers are often used when transporting fluids so it had the necessary design specifications to keep the waste contained before a sewage waste treatment company comes to empty the tank. The outside of the tank was painted in black to allow less light/heat into the container and for aesthetic appeal. The outside of the tote tank had lattice panels around the container to prevent any outside contact with the container (i.e. animals or humans).

**SafiChoo Toilet Seat:**
The SafiChoo toilet system (Figure 3) was modified for the Global Growers Unit to include a permanent lid attachment similar to lids on Western-style toilets (Figure 6). The lid attachment is made from medium density fiberwood in tiered layers to ensure that there is no gap between the edge of the Safichoo toilet system and the lid’s edge.

**Handwashing Unit:**
The hand washing unit (Figure 4) was created from a 5 gallon bucket with a small spigot at the bottom of the bucket. It is water sealed. Possible improvements could be to implement a small mesh lining to the top to prevent blockages by leaves, twigs, etc that get into the bucket. During the winter, the bucket is filled from store bought water but during the summer, water is supplied from outdoor water line that is shut off during the winter.

**Ventilation Pipe:**
The ventilation pipe is connected to the inside of the tote tank and runs outside to the top of the latrine shelter (Figure 5). It contains a small meshed section at the top of the pipe. The ventilation pipe allows continuous ventilation across the top of the pipe that removes odors but also ensure that any flies are attracted to the odors escaping from the top of vent pipe, instead of the toilet itself. The wire mesh fly-screen prevents entry and exit of the flies so flies cannot enter and any flies trapped in the vent pipe eventually die and fall back into the pit, preventing the spread of pathogens from flies.
Bill of Materials:

- **10** 4’x6’ plywood boards
- **3** 2’x4’ aluminum metal sheets
- **1** 330 gallon IBC tote tank
- **8** 2”x4”x12’ assorted lumber material
- **2** locking hasps
- **2** bar door handles
- **8** 2”x6”x10’ boards
- **4** 4”x4”x12’ boards, pressure treated
- **3** 60lb bags of cement mix
- **15** feet of 3” diameter PVC piping
- Accessory materials like screws, paint, mesh, PVC glue, etc.

Evaluation

On April 8th, 2017, a focus group was conducted with approximately 20 resettled community farmers from Bhutan or Nepal. They were separated into 3 groups: people who had used the toilet before, people who had not used the toilet before but knew about the toilet, and people who had not used it or knew anything about it. The latter group was the largest (about 10 people) and the people who had used was the smallest (about 3 people). The users had different point of references for what toilet they were used to using on a daily basis. Some were used to squatting and were referencing their experiences in Bhutan/Nepal when answering while some references their western toilets that they have at home/work in Georgia. Some were used to using just toilet paper, while some were used to using water to cleanse or pour-flush toilets.

Main Takeaways:

<table>
<thead>
<tr>
<th>Most important factors for the users:</th>
<th>Cleanliness (most important)</th>
<th>Smell</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the users liked:</td>
<td>Proximity to gardens/farms</td>
<td>Best for emergency use and for children</td>
<td>The toilet is comfortable</td>
</tr>
<tr>
<td>What the users disliked:</td>
<td>The Seat was too high (particularly for children)</td>
<td>Mud on the inside made it seem dirty</td>
<td>The fact that it was a dry toilet made it less appealing</td>
</tr>
</tbody>
</table>

Other Comments:

- The system design was viewed as too complex for the simple needs of the garden community.
- The seat was reported to be too high. Many children of the farmers were using the seat and couldn’t comfortably get onto the seat and then also reach the toilet paper on the ground.
- The lid was not functioning properly because there was a little space that may have been letting through flies and spreading pathogens. *(The lid was not on when W4W initially saw the toilet, but was hanging off the edge of the seat or extra space on the side of the hole. However, when people saw that the lid was on before use, they put the lid back on. People reportedly understood the graphic W4W placed inside of the toilet facility made to say why the lid should be put back on after use)*
- The fact that the users could see into the hole of the toilet, thus seeing the waste
inside was not appealing to them. They aspired for a water-based system; however, due to the limitations of W4W and Global Growers regarding waste management service providers and budget, a dry toilet was the best option for this first toilet offering for the site. (Social desirability bias and language barriers are also limitations recognized throughout the data collection process of this project).

**Improvements and Next Steps**

From the focus group, a new lid was constructed to make sure there wasn’t a gap between the seat and the lid. Furthermore, for the next build, a design blueprint for the structure surrounding the toilet should be built. While the original structure was built at Global Growers, there was a lot of time spent on site discussing the plan instead of getting the building done. With blueprints as well as instructions on which steps to take to build the structure, this time can be significantly reduced. The hope with this is that the design could be given to a group of people (not necessarily those a part of the Wish for WASH team) who would be able to follow the directions in assembling the overall structure.

![Finalized W4W and Global Growers Toilet Facility](image)
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everybodypoops