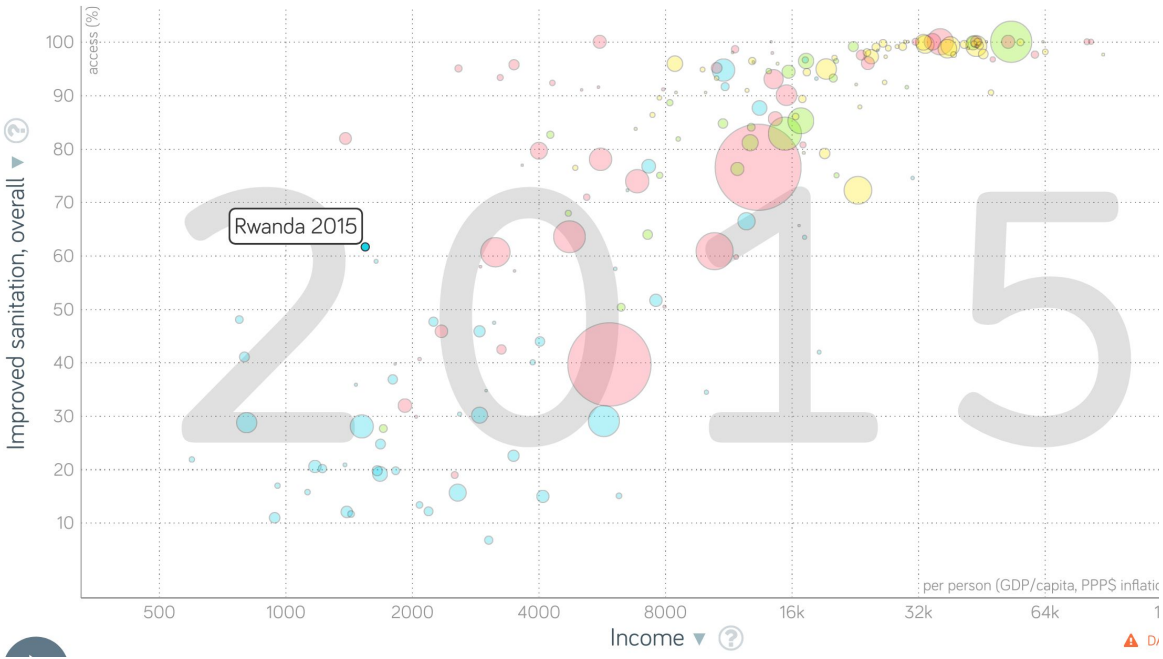
Composting Waste for the Sunzu Yacu Community Library

The Problem

- One latrine for Sunzu Yacu
- Septic tank is overflowing
- Can lead to serious illness
- Composting and other sustainable solutions to waste management aren't widespread in Rwanda



Sunzu Yacu Village and the Old Latrine

Mia Sheperd November 13, 2017 at 8:19 PM

To: annalisa.bal@sbcglobal.net, Carly Althoff and 2 more... Inbox - Yahoo!

MS

Re: A new idea - empty the overflowing septic tank

New contact info found in this email: Mia Sheperd mia@journeymaninternational.org add...

Team,

Thank you very much for all of the time and effort you put into this. We are going to the site today, so this could be an interesting conversation.

The distance is a 10-12 minute walk. It is not very far, but far enough to consider two composting structures rather than one. The two places I would look up are Sunzu Yacu Library (the new latrine) and Mwiko School (the old latrine). I couldn't find it when I looked it up so I took a screenshot and circled the school, hope that helps!

Thank you again for this insight! You all are awesome! Let's skype or messanger or whatever works sometime this next week!

Mia

TLDR;

- The **old latrine** (overflowing!) is located at the Mwiko School, which is a **10-12 minute walk** from the community center to the Mwiko School

- The **new latrine** system is on the **same campus** as the community center

Mission Statement

Our Mission

- To **design** a sustainable composting system for human waste at the Sunzu Yacu Community center. Our goal is to **provide a system** that promotes sanitation and health, while simultaneously using waste as food for on site gardens.
- The Sunzu Library is located over a valley containing a community by the river. These people may be able to benefit from readily available manure

Mission Statement

Our Mission

- To **design** a sustainable composting system for human waste at the Sunzu Yacu Community center. Our goal is to **provide a system** that promotes sanitation and health, while simultaneously using waste as food for on site gardens.
- The Sunzu Library is located over a valley containing a community by the river. These people may be able to benefit from readily available manure

Revised Mission Statement

Our Mission

- To **collaborate** with different **stakeholders** to determine the best course of action in developing a **sustainable composting solution** for the latrine issues at the Sunzu Yacu Community center.
- Our goal is to **help research** a system that promotes sanitation and health, while simultaneously using waste as soil for on site gardens.

Our Role

1. Research
    a. Learn about composting
    b. Create a PDF
2. Listen
    a. Email
    b. Facetime
3. Give Feedback
    a. Troubleshooting problems such as:
        i. Retrieving waste, creating ventilation, diverting urine, etc.

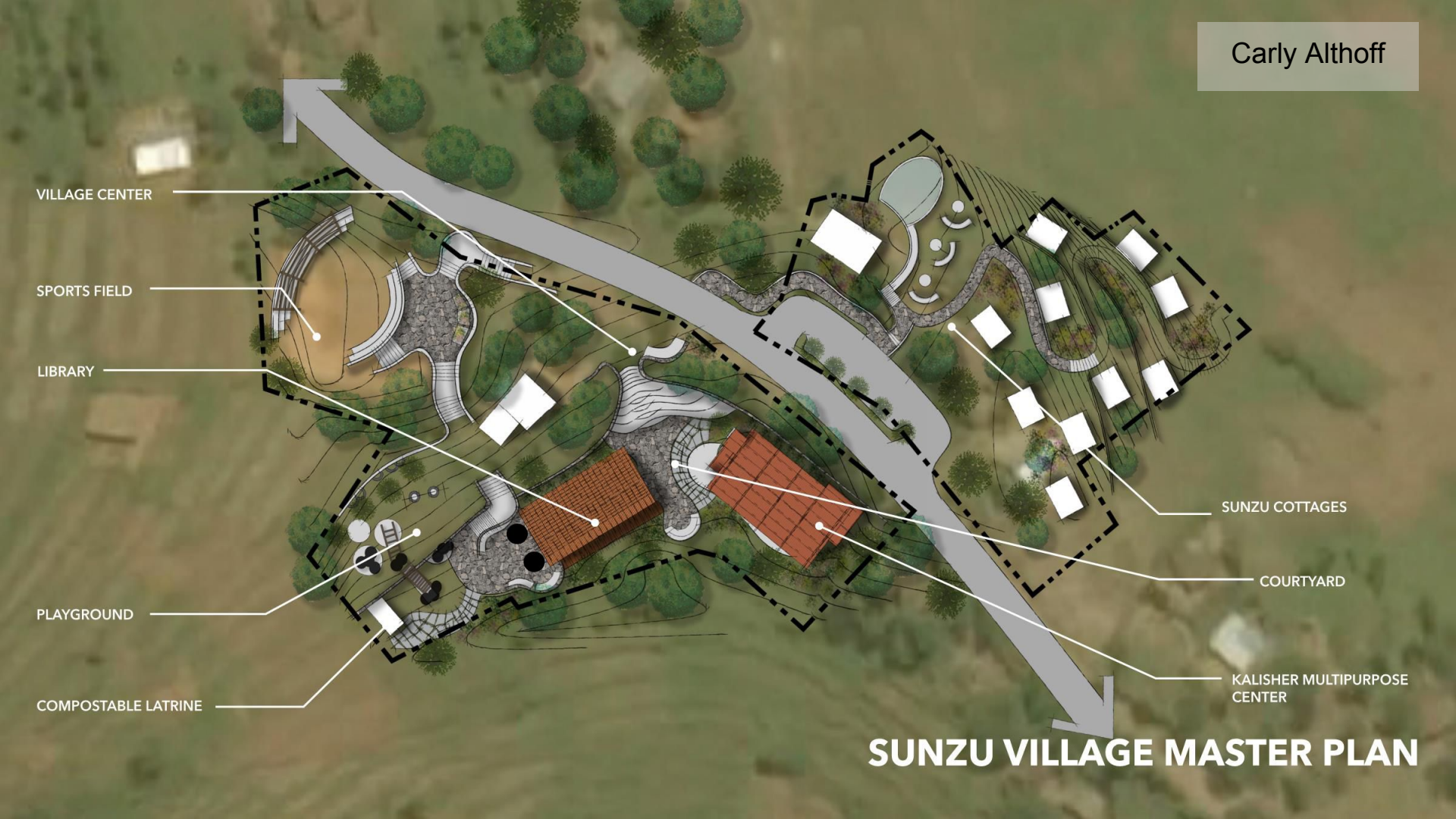
The Community at Sunzu Yacu

- Community center is located on top of hill in the African great lakes region
- Two rainy seasons and two dry seasons
- Agricultural community
- Very welcoming towards outsiders
- Environmentally friendly
- Community center is used mainly by children of the village

The Stakeholders at Sunzu Yacu

- Journeyman International -- Mia and Carly
- Primary donor --Tom
- Local Volunteers --John of Peace
- Visitors to the community center

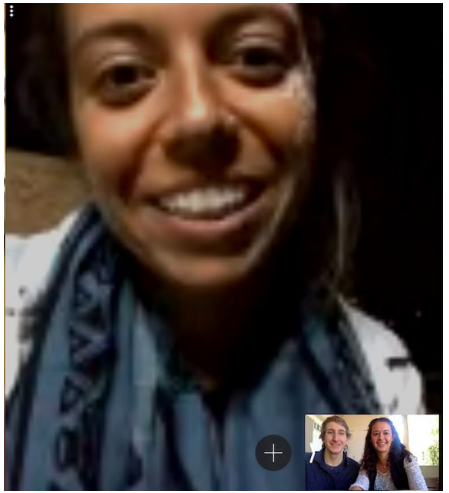
Carly Althoff

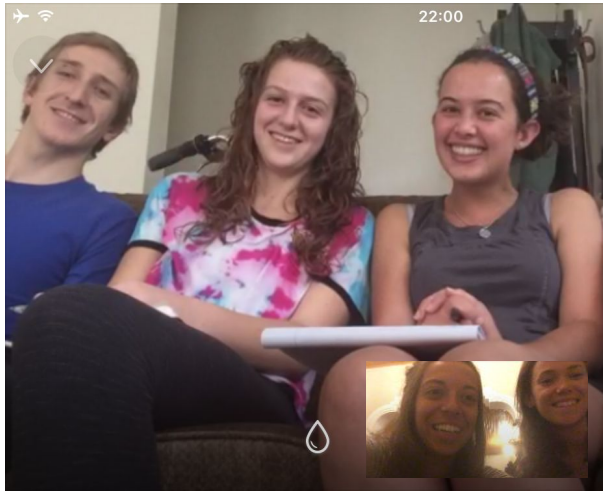


SUNZU VILLAGE MASTER PLAN

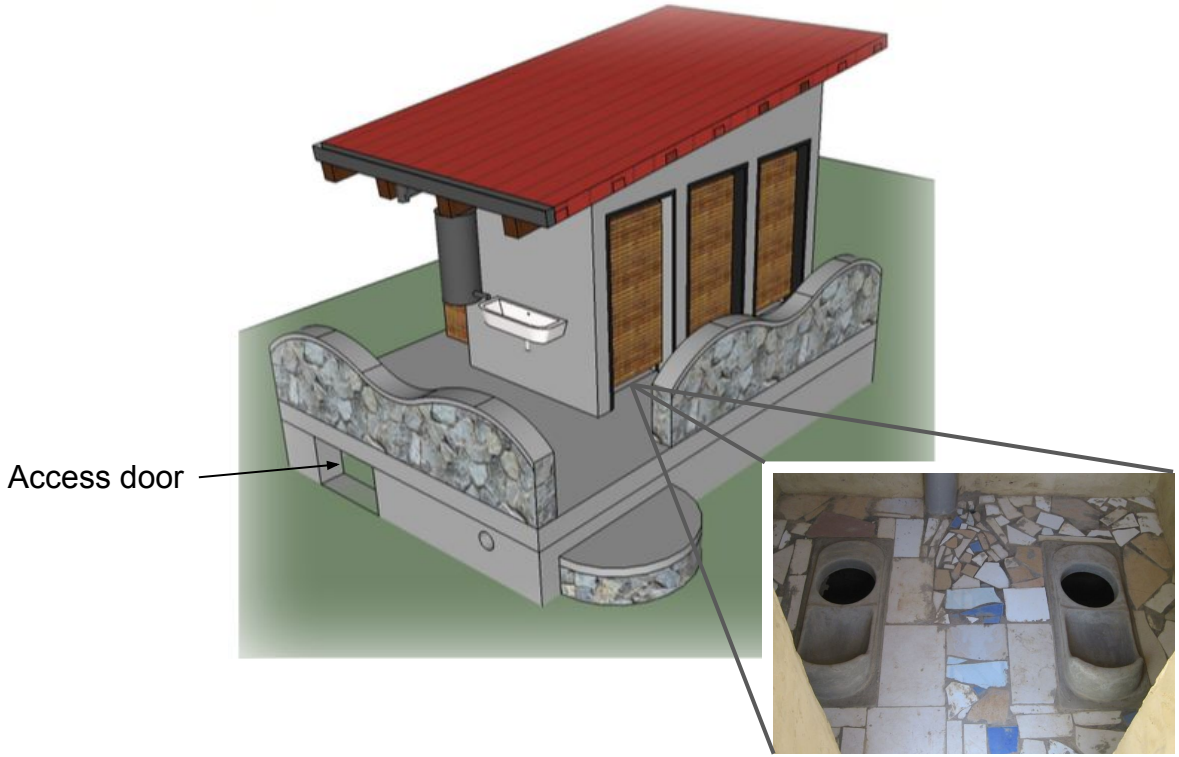
Correspondence

- We were lucky enough to have people on site to talk with!
- Carly and Mia...
  - told us about the design and building efforts
  - asked us for feedback
  - gave us specific challenges to research
- We…
  - asked questions
  - acted as an outside opinion and focused research group

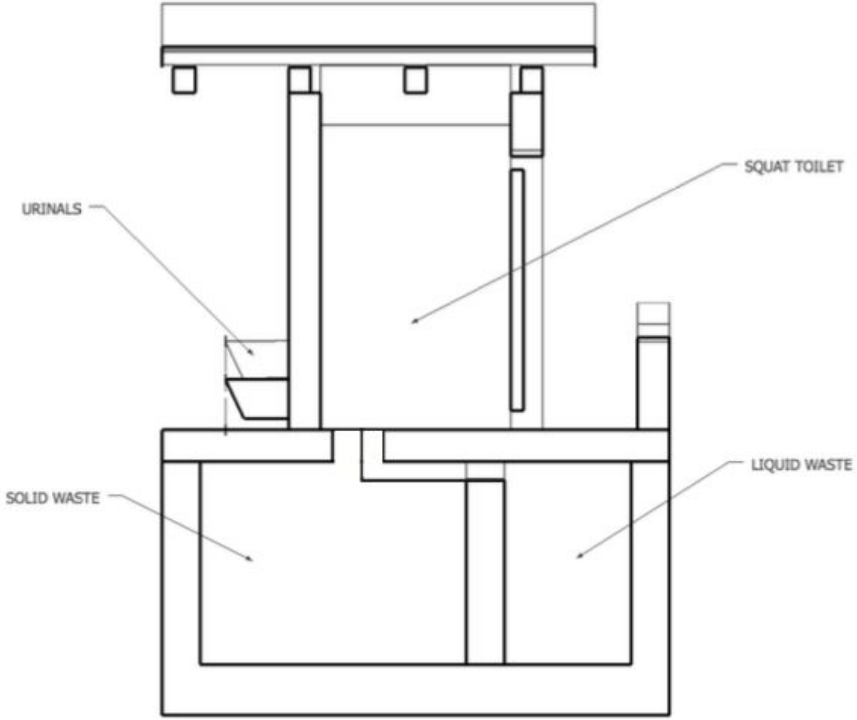


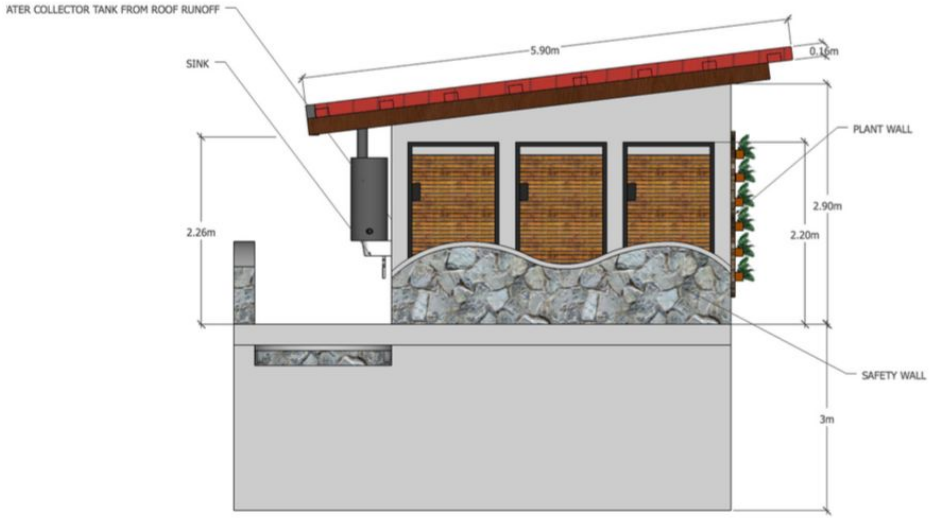


Carly and Mia’s Latrine Design



Example of typical squat toilets with urine diverter


URINALS
SQUAT TOILET
SOLID WASTE
LIQUID WASTE


ATER COLLECTOR TANK FROM ROOF RUNOFF
SINK
5.90m
0.10m
PLANT WALL
2.26m
2.90m
2.20m
SAFETY WALL
3m

The Construction Site: Mia, Carly, and John of Peace

Our Feedback

Consulted with Pete and gave them suggestions:

- Make it easier to remove waste (access door, slope)
- Focus on HOW remove waste from storage area *before continuing construction*
- Empty the overflowing tank
- Lids on toilets
- Urine diverter

But they already started construction and were unable to stop, pressure from:

- The man funding the product
- The community building it

annalisa.bal@sbcglobal.net November 5, 2017 at 11:51 AM

To: Mia Sheperd, Carly Althoff Cc: Donald Hersam, jenny smit Sent - Yahoo!

Video Call Notes 11/6/17 - Composting Toilet

Hey Mia & Carly,

Thank you so much for spending time educating us on the current status of the latrine build! It is honestly such a privilege to be able to learn from you about that all that is happening in Sunzu. Here are some notes from our FaceTime call this morning.

Challenges currently being faced:

1. Collection Container
   a. Problem: drop from squatty to the floor is 6ft...need some type of metal drum or system to collect waste and then bring it out through the access door.
   b. Possible Solution: Having the floor of the latrine be sloped in such a way that waste moves downwards from the toilet end to a lower point nearer to the service door. This might provide a case for less human interaction with waste/latrine area. This would require somewhat of a re-design to the original plans.
2. Composting Material
   a. Problem: Need to find enough sawdust.
   b. Possible Solution: Composting material does not have to be only sawdust!! Any type of dried plant material will work. Dried or already decomposed material works best because bacteria and fungi in them.
      i. Examples: banana leaves, banana peels, straw, grass,
3. Urine Diverter
   a. Problem: Need an easy way to separate the urine hole/pipe from the hole used for solid waste.
   b. Possible Solution: Funnel Urine Diverter from previous appropriate tech class: http://appropriatetechnology.wikispaces.com/Composting+toilet

Other good things to know...

1. Amount of material composted at one time (according to Pete!)
   a. A single 15-gallon bucket (~ 30 lbs) is good for 50 adult healthy poops (covered with a thin layer of dried plant matter) and requires about half a square meter to compost, and about a cubic meter of vegetable matter (straw, grass, banana peels, etc) to compost.
   b. Pete says that after 3 months of compost heating up and being occasional turned, it should be ready to use. That being said, it might be safest to wait 6 months.

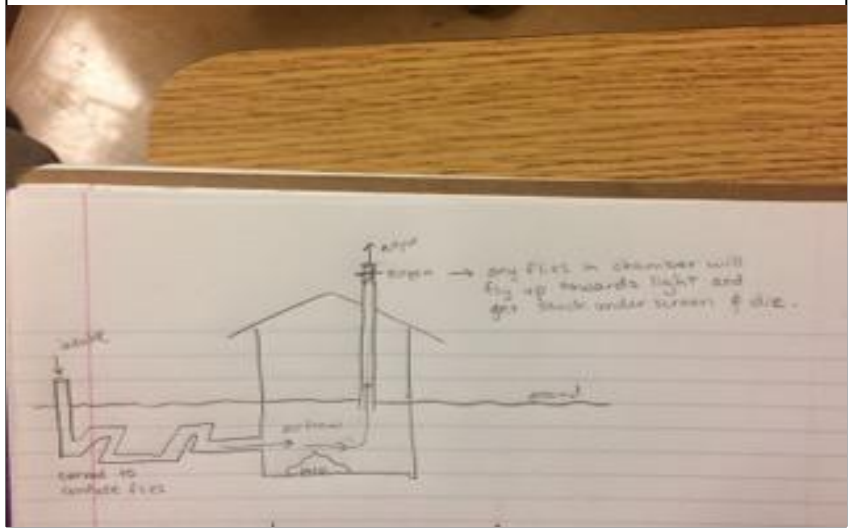
Questions to Consider...(do not need to be answered right away!)

1. Where will the urine go after being diverted?
2. Where will the compost pile be? How will we prevent rainwater from flowing through the compost pile? (Cover with long grass or palm fronds, moat, shelter etc.) How will the compost pile be allowed to sit undisturbed for long enough?
3. Is it still possible to install a solar panel/fan for air flow?
4. How have the Rwandan staff members at the community center responded to these designs?

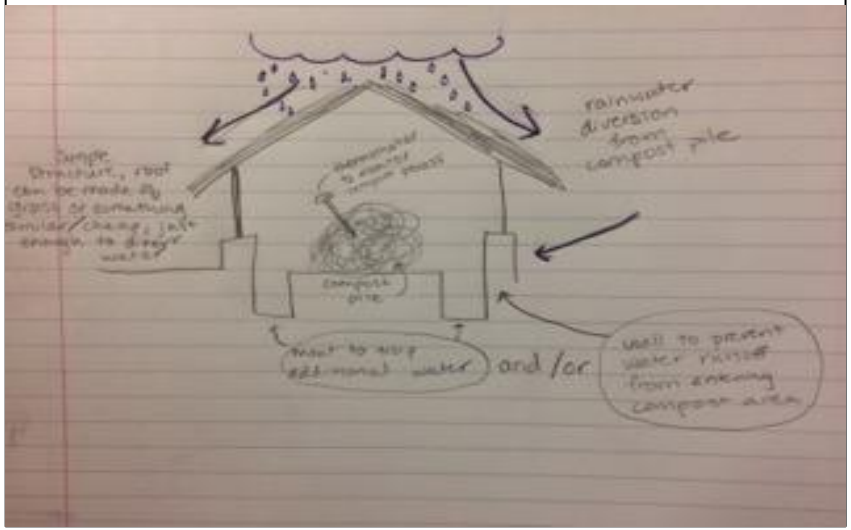
Thanks so much for being so willing to talk with us! Looking forward to hearing how it goes tomorrow. :)

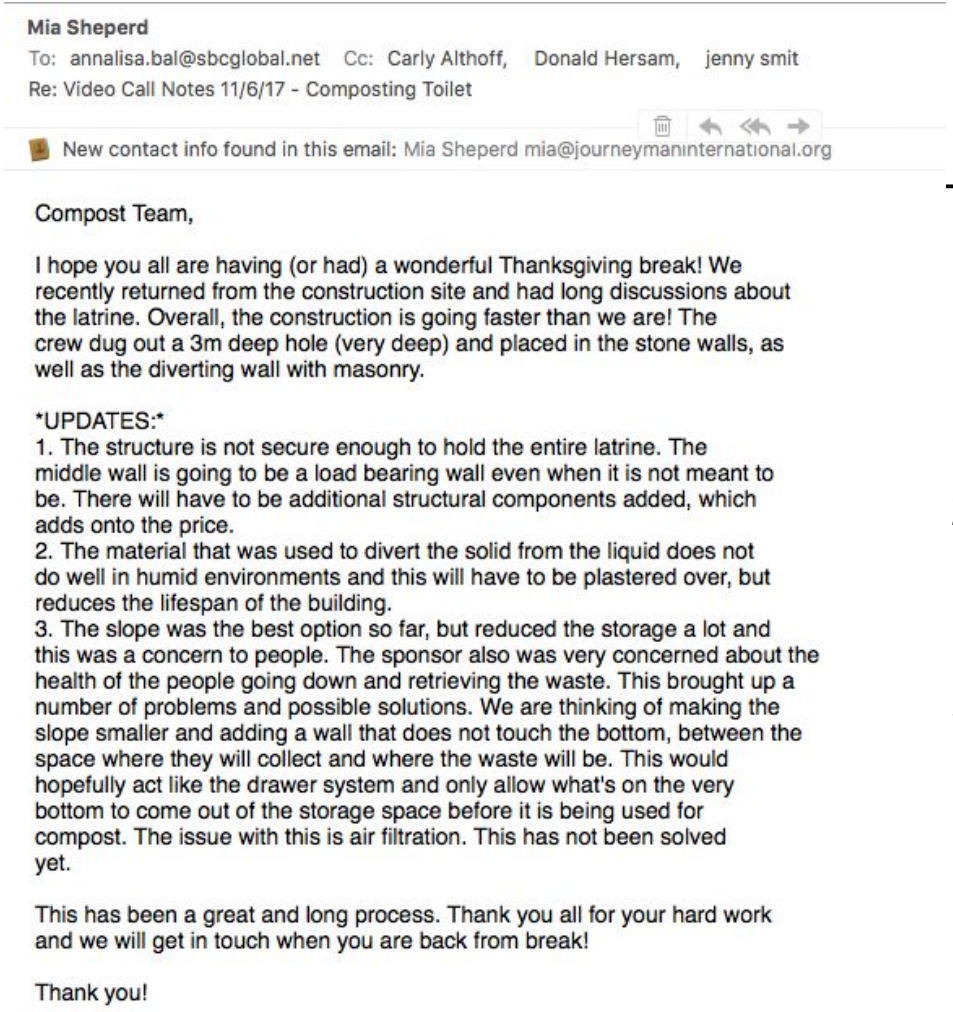
Our Feedback: Structural Suggestions

An underground pipe system could both heat air for **ventilation** and keep flies out



A raised wall system around the compost pile could prevent rainwater from causing waste materials to leak into the environment





Mia Sheperd

To: annalisa.bal@sbcglobal.net Cc: Carly Althoff, Donald Hersam, jenny smit

Re: Video Call Notes 11/6/17 - Composting Toilet

New contact info found in this email: Mia Sheperd mia@journeymaninternational.org

Compost Team,

I hope you all are having (or had) a wonderful Thanksgiving break! We recently returned from the construction site and had long discussions about the latrine. Overall, the construction is going faster than we are! The crew dug out a 3m deep hole (very deep) and placed in the stone walls, as well as the diverting wall with masonry.

UPDATES:
1. The structure is not secure enough to hold the entire latrine. The middle wall is going to be a load bearing wall even when it is not meant to be. There will have to be additional structural components added, which adds onto the price.
2. The material that was used to divert the solid from the liquid does not do well in humid environments and this will have to be plastered over, but reduces the lifespan of the building.
3. The slope was the best option so far, but reduced the storage a lot and this was a concern to people. The sponsor also was very concerned about the health of the people going down and retrieving the waste. This brought up a number of problems and possible solutions. We are thinking of making the slope smaller and adding a wall that does not touch the bottom, between the space where they will collect and where the waste will be. This would hopefully act like the drawer system and only allow what's on the very bottom to come out of the storage space before it is being used for compost. The issue with this is air filtration. This has not been solved yet.

This has been a great and long process. Thank you all for your hard work and we will get in touch when you are back from break!

Thank you!

More Problems Arising

TLDR;

1. Another wall needs to be build in the waste storage area to support the latrine
2. The material used for the urine diverter is not suited for humid environments
3. Person must go into storage area to retrieve waste -- considering a drawer system with a sloped floor

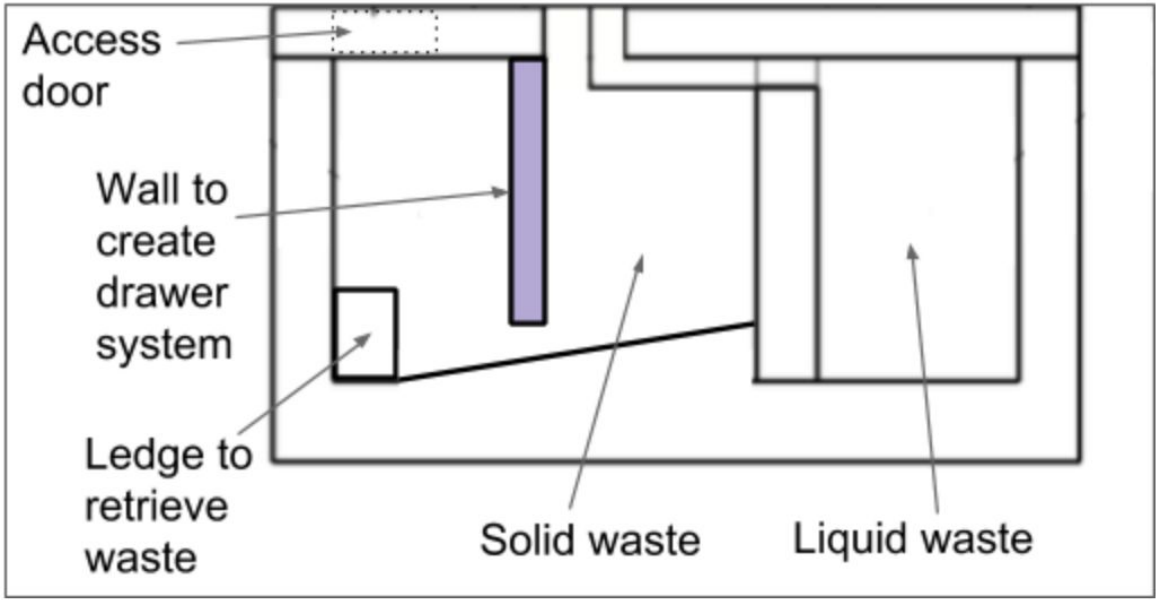
Construction Development Timeline

New Latrine System
- two squat toilets
- one western style toilet

October: Digging Began
November: Concrete Poured
December: Construction in Process

Improvements to Design

- Added Wall to Create “Drawer System”
- Location of Access Door
- Ledge for easier waste removal
- Trap Door



And yet, still more problems...

1. The primary funder is insisting on a western flushing toilet
    a. This could contaminate the urine being diverted
2. Ventilation
    a. Black Piping with top vent suggestion
3. Where compost goes
    a. Liquid waste long term
    b. Compost pile

Removing waste from the latrine could still be difficult even with slope, drawer system, and top access door.

Conclusions

- Still facing many roadblocks, designs somewhat flawed
  - Construction superseded testing
- Intentions of JI and others to stay involved long term are promising
  - People will be there to solve problems