

Brian Reed

“Class of 1978 Fund” Grant Report

This past summer, I had the great fortune of volunteering with the US-based NGO PITCH\_Africa, during the first implementation of their Waterbank School design in Segera, Kenya. I lived on a nature reserve owned and operated by the Zeitz Foundation, a partner of PITCH, and I spent most of my days at the local primary schools, where I helped oversee the construction project, demonstrated a few water collection and purification technologies, taught several lessons on science, English, and mathematics, built relationships with the community, and researched the unique challenges faced by members of Segera. I spent most of my time in the two main primary schools in the Uaso Nyiro system within Segera, though I also visited nearby Endana Primary School.

I owe the Class of 1978 an enormous debt of gratitude for enabling me to undertake community service work this past summer, as this work allowed me to positively impact a foreign community, and it both expanded my worldview and solidified my plans for the future. The following is an overview of my time in Kenya.



*Students in grades 5-8 say “welcome” on my first day at Uaso Nyiro Primary.*

# 1) The Community

The people in Segera were some of the most incredible people I’ve ever met, as even though they faced immense challenges—the vast majority of the population lived on less than \$1.25 a day, and few even had access to clean water—the community members were extraordinarily friendly and kind. I think some Westerners get the impression that Africa is impoverished because its people don’t work very hard, but I came to see that this idea is completely and utterly unfounded. Many of the kids walk miles to get to school by 7:30 A.M each morning, and their parents are in charge of raising the livestock or growing the crops, if they are lucky enough to live near the water. The kids take on an incredible level of responsibility to help their parents: one of the more amazing sights I witnessed involved 2 children, presumably between the ages of 8 and 12, watching after a herd of over 15 cattle by themselves, aided only by a small stick they used as a whip. From my view, while the residents of Segera were not fortunate enough to live in a society where their hard work turns

into material wealth, their hard work is manifest in the fact that they have secured such necessities as food and shelter.

I'll do my best to paint a picture of the village so you can better understand the challenges they face. The "town" of Segera is extremely rural and relatively primitive, as many of the community members are pastoralists and live in huts—manyattas—they constructed with mud, stones, and straw. Interestingly, the vast majority of these people have cell phones that they charge using community solar panels, and a few of the manyattas even have a solar panel on top of their straw roofs. The town is composed of several smaller villages, and the one nearest to me, called Depatas, consists of a row of shacks that serve as stores, barber shops, etc. Sanitation is poor, to say the least, as there are pieces of trash littering the "road" and the dirt on either side of it, and many people drink directly from the river, which is polluted with a small amount of trash, runoff from the road, and whatever sewage has seeped through the ground from the pit latrines that are within a few hundred feet of the water. Once a week there's a market in Depatas, and people walk to it from all over to sell goats, cattle, and whatever produce they have grown. I was told that, for most families, this is the only opportunity they have to go shopping, so they have to buy everything they need for the week, even though they often only have a few hundred shillings, equivalent to a few dollars.

The physical structures in the village only tell part of the story, though, as the people are fascinating. Many of them wear traditional outfits—if you Google "Maasai" or "Samburu" you'll probably get a good idea of how said people normally dress—and whenever I waved or smiled at them, they broke out into grins and greeted me in English or Kiswahili. Although my Swahili was, to say the least, terrible, I mastered the greetings, which means I could usually break the ice or satisfy someone I passed by. The students at Uaso Nyiro Primary School helped me gradually expand my vocabulary in the national language, but there were still plenty of awkward moments when a student came up to me and say something in Swahili that I'd never heard before, then watch delightedly as his or her classmates cracked up. This is probably one of the few things that I don't miss about Kenya!

One of the coolest parts of my time in Kenya was seeing how the community embraced the project. Every day when I was on the site, the teachers would ask me how the school was coming, and they'd always express excitement about the prospect of having high-quality new facilities, not to mention easy access to potable water. The students, too, were extremely curious about the school, as during their breaks they would often loiter around the edges of the construction site and watch the work. Several students showed up to watch the first weekend, too, when we were initially breaking ground. They filtered in between eight and nine a.m., and by mid-morning between fifteen and twenty kids were sitting on the side of the dig, watching the mechanic shovel clear space for the foundation. I went over to them and starting talking with them, and before I knew it they had my camera in their possession and were taking (literally) dozens of pictures with it. Below is one of the pictures the kids took with my camera.



## 2) The Project

PITCH's main goal is to marry technology and sport in such a way that will alleviate some of the problems in developing nations. Their flagship project is a soccer pitch that collects rainwater that hits the field and the stands, then directs this water down to the field, which is a membranous filter lying on top of a million-gallon water tank. This pitch is designed to be a center for community life, as it provides access to clean water, and it provides space for classrooms, health facilities, and community meeting places in rooms underneath the stands. The project that I worked on, a "Waterbank school," utilizes similar principles, but the venue is primarily an educational facility. It has four classrooms arranged in a square around a center courtyard, under which lies a 150,000L tank. The four segments of roof (one on each side of the square) each slant down towards the courtyard to direct rainwater into this tank. This school can be constructed for the same price as a typical four-room schoolhouse.

There is a circular wall around four sides of the school, and this both enhances security by reducing the number of entry points and creates space for three gardens to be cared for by the students. The gardens help add a personal touch to the school, as the students and members of the local community love flowers but find it difficult to maintain gardens because the local wildlife shares their passion. In addition to the four classrooms, there is a space for the community and a place where students can conduct plays and other artistic performances. This theatre space will certainly be well used, as the 5<sup>th</sup> through 8<sup>th</sup> graders at Uaso Nyiro Primary School. When I was in the country, the girl's song and dance club placed second in a regional competition, in which their primary competition was private schools.

### a) Construction



*The construction site, on my first (left) and last (right) days in Kenya. On the right, the*

*foundation has been filled in, and the water tank has been completely constructed. After I left, the workers began construction on the physical structures of the school.*

When I first arrived in Segera, I knew what my responsibilities were, but I was not sure what to expect, as I had never been involved in construction work before. There were two main phases to the construction work while I was there: a setting out phase, which involved measuring the foundation, and a phase involving hard labor, during which we laid the foundation for the school. I'll address each of these phases individually.

#### i) Phase 1: Setting Out

The first phase of the project involved making sure that all of the measurements were completed as planned. This more or less involved translating the design for the school into a chalk outline on the grass, which acted as a guide for the operator of the mechanical shovel. While it seems as if it would be easy to merely measure and mark the exterior of the school, we ran into some challenges that I, at least, hadn't anticipated. In the first place, the wind was very strong, so we wound up having to pull the measuring tape as tight as we could and line up several people along its length to prevent it from blowing from side to side. This worked pretty well at first, but after doing this for 2 or 3 days, we realized that we had stretched out the tape to the point where it was about 26 cm off for every 12m—a significant difference, considering the sides of the school were 24m. This trial was fairly symbolic of some of the challenges we faced in the project: it was something completely unexpected that arose from a combination of less than ideal conditions and far from state of the art equipment.

Once we finished laying out the school in chalk, we brought in a mechanical shovel operator to dig out the foundation. For me, the digging was one of the coolest parts of the project, as the kids took an immediate, genuine interest in the digging work. Even though we were working on Saturday, when none of the kids were in school, a steady stream of students filtered onto the school grounds to watch the construction, as described above. They wound up sitting all along the dirt piles on the side of the site, and when I went over to them, they managed to gain possession of my camera and take around 80 or 90 pictures with it.

This was the start of a pretty close interaction between the kids and I that carried on throughout my time there. At various points, I played volleyball and football (soccer) with them, taught some academic lessons, learned bits of Swahili (sometimes from a first-grade Kiswahili book), and just talked to them about whatever was going on in the area at any given time. I am still amazed (and thankful!) that they were so friendly and welcoming.

#### ii) Phase 2: Digging and Filling In

After the setting out phase, we began the work of setting the foundation. This initially involved a lot of digging, mostly by machine but partially by hand as well. Contracted workers did a lot of the work in this phase, but the parents in the community helped out a bit as well. It was incredible to see the parents come and help out with the project, as when I arrived on the site, there were at least 75-100 mothers and fathers, dressed up in their bright clothing, around the perimeter of the dig, helping to dig out the holes for some of the perimeter columns (and conversing amongst themselves). Below



are a few pictures from the day the community came to help out. As you can see, some of the mothers even brought their infants along. It was truly a sight to behold.



Throughout the digging phase, the contractors worked to create columns and a lattice foundation from the rebar. This was fascinating to both watch and help out with, as the workers created impressively large metal structures using nothing more than a metal pipe, nails embedded in a wooden horse they had created, hand-held saws, and metal twist-ties. The workers were inspiring because they were so hard working, and they maximized the utility of the materials available to them. They never asked too many questions or complained—they just did the best they could with what they were given.

As the digging progressed, and as the work subsequently shifted into more technical phases of construction, I shifted my attention away from the construction and towards other tasks. While I still visited the site each day to document the progress and make sure everything was proceeding according to plan, I began to conduct a bit of research into the environmentally-conscious technologies in the area, namely conservation agriculture practices (such as drip irrigation), solar-powered lanterns and cellphone chargers, and propane stoves. I also started to introduce some additional technologies that will help the community members collect and purify water.

## b) Water Technologies

### i) Rainchute

During my time in Kenya, one of the co-founders of PITCH, Jane Harrison, came to Segera to demonstrate a novel way of harvesting rainwater—using a retired U.S. Army parachute to increase catchment area. With one parachute, a family of six can collect enough rainwater to meet its water needs for the year. The rainchute works as follows.

Twenty-four wooden poles, evenly spaced around the exterior, prop up the parachute, and lengths of string are tied to the tops of the poles and to twenty-four stakes to help increase stability. Once standing, the “rainchute” directs water into a hole in the middle of the chute, where it can be collected and stored. This technology offers a creative way to take advantage of Segera’s seasonal rains, and it is extremely cost-effective because the poles are locally sourced and the Army has no need for its old parachutes.

During demonstrations of the rainchute at Uaso Nyiro Primary School, the chute picked up an unlikely moniker: the Chuck Norris Rainwater Harvester. Chuck Norris, after all, starred in the movie *Delta Force*, which took place in the 1960s/70s, the same era the parachute was manufactured in. The connection between the chute and the movie/TV star has helped the school embrace this unique method of rainwater harvesting.

The rainchute is pictured below on the grounds at Uaso Nyiro.



Photo Credit: Jane Harrison,  
PitchAfrica

## ii) Water Filters

In addition to the rainchutes and innovative building designs, PITCH and the Zeitz Foundation are also introducing ceramic water filters that can filter out 99.9% of bacteria from water. It was my job to introduce these filters to the students and staff at Uaso Nyiro, so that they are familiar with the technologies that will be put into use at their new school. I did this through a demonstration to all the students and staff at both campuses of Uaso Nyiro. I performed the demonstration, too, at nearby Endana Primary School, alongside one of the workers from the Zeitz Foundation (pictured below).





I also helped begin an ambassador program with the water filters to ensure that some of the staff and students are able to maintain and repair the filters. To this end, I spent some extra time working with members of the girls' volleyball and netball teams, in addition to members of the school's "Peace Club," to make sure that they know how to clean the filters, and how to tell that the filters actually need to be cleaned. Below is a picture of the water filter ambassadors.



### 3) Final Thoughts

My experience in Kenya this past summer was incredible, and I owe the Class of 1978 Foundation much more than just this report. I am grateful to have even had the opportunity to help out in Kenya, as I have been exceptionally fortunate so far in my life, and I feel as if I should give back to a world that has given me so many opportunities.

While at times I found myself more frustrated than I had ever been—oftentimes even the simplest tasks proved to be extraordinarily difficult—the experience was truly eye-opening, and it helped me become a more mature and determined person. I now plan on studying some mix of systems engineering, international economics, sustainable energy, and ethics, and I hope to build upon the experience I had this past summer. Hopefully before too long, we will reach a point where no one will need to carry out work of the sort I was involved with this summer; but I am glad to have had the opportunity to work with PITCH, the Zeitz Foundation, and the Class of 1978 Fund to bring that day ever closer.