



ENGINEERS WITHOUT BORDERS USA MASSACHUSETTS INSTITUTE OF TECHNOLOGY CHAPTER

NEWSLETTER

ewb.mit.edu | Editors: Amel Elawad and Chris Eschler | Volume 2 No.2 Fall 2019

EDITOR'S NOTE

By: Amel Elawad '21

We are happy to share with you our 2019 issue of our annual newsletter! This issue will include reports on our progress as a chapter through this academic year starting with our Assessment Trip in summer 2018 for all our active projects, namely Female Sanitation, Structures, and Solar Manual. Included is also a trip recount detailing the findings from our Assessment Trip 2019.

We would like to thank everyone who has supported our EWB Chapter. Thank you to our wonderful mentors and partners from the EWB Boston Professional Chapter, our mentors from SMMA, our faculty advisor Tal Cohen, our graduate student mentor Katerina Boukin, and the Edgerton Center for their continuous support and guidance. Finally, a huge thank you to our donors and members who have been the lifeline of this chapter and without whom this chapter wouldn't exist.

Thank you to everyone that helped get this newsletter together!

Enjoy the issue!

ACTIVITIES REPORT

Female Sanitation Project

By: Amel Elawad '21

1. Summer 2018 implementation trip

On our last implementation trip in August 2018, and after meeting with the community, the women expressed that inadequate access to female sanitation products, such as sanitary pads, is preventing girls from attending school during menstruation. The women of Mkutani also raised the concern of not having a Birthing Center that was private from the men. We have since started our new Female Sanitation Project as of September 2018. By providing proper sanitary materials to school-aged girls, we will be able to remove this harmful barrier to attending school and help them to realize the full extent of their education. Additionally, by building a birthing center with reliable medical equipment and a suitable delivery environment, we will increase the number of births within a healthcare center.

2. Spring 2019 progress

Much of our work to date has involved collecting information about previous solutions in other areas and potential adaptations to these solutions that would make their implementation more feasible in Mkutani. We have reached out to other nonprofits that have conducted similar work elsewhere in Africa (such as I-Care and the Dare Women's Foundation) in order to understand how they have addressed the issue. Overall, we have surveyed potential materials and finished products over the course of our research, and hope to incorporate some of these past solutions into the solution we implement.

3. Summer 2019 assessment trip

On our assessment trip during Summer 2019 we conducted a few focus groups. The focus groups addressed females within a range of age groups but targeted school-aged girls in Mkutani in order to understand how they managed their periods. The needs assessment that followed suggested that menstruation management was a mixture of an education issue and a water supply issue. The results from those focus groups helped guide the design for the girls' latrines renovation project carried out by the Boston Professional Chapter.

4. Fall 2019 – progress

The Female Sanitation team has started working on the other need raised by the village of Mkutani. We are working alongside our partners and mentors from the Boston Professional Chapter as well as with Build Health International to embark on a greater 5-year project for a Birthing Center, fully staffed and equipped ready to meet the needs of the village of Mkutani.

Structures Project

By: Natasha Stamler '22

1. Summer 2019 assessment trip

During our Summer 2019 assessment trip, we conducted soil sampling near the current school building with the guidance of Professor Einstein from the Department of Civil and Environmental Engineering. Based on these results, we concluded that the land owned by the school in Mkutani is suitable for building a schoolroom.

2. Fall 2019 progress

This semester, the Structures team has focused on training new members and performing the initial planning for the new schoolroom. This has included extensive discussions with BPC and the onboarding of Alexis Moser, our new BPC structures mentor, who is a structural engineer at SMMA, and Katya Boukin, our new MIT structures mentor, who is a graduate student in the Department of Civil and Environmental Engineering. Our team has begun to design basic designs and "shall" statements, specific requirements that the building must satisfy. In the spring, we will focus on training our members in technical skills, such as using Revit, and meeting hard design and write-up deadlines in preparation for an implementation trip. Throughout this process, we will work in partnership with BPC, and will maintain frequent contact with Semu, our in-country contact, to ensure that the building is feasible to construct and aligns with the needs of the community of Mkutani.

3. IAP 2020 - looking forward

This IAP Chris will be teaching a class to recruit and train new members to supplement the work of the Structures team during the fall and spring semesters. Students will learn about global development by following the EWB project timeline for a similar small project. Projects will focus on designing a small-scale solution to a global problem in engineering design in the areas of Water Supply and Sanitation, Energy, or Structures. The focus will be on process rather than product. Class sessions will include lessons, discussions, and hands-on projects. There will be opportunities to network with professional engineers and architects from

BPC. Our goal is for students to develop sustainable engineering solutions and, hopefully, desire to join EWB in the Spring.



Meeting with the school committee

Solar Manual Project

By: Liam Herndon '21

1. IAP 2018 assessment trip

During our 2018 assessment trip, we met with Walter Kirita, the head water engineer for the Dodoma Region, who described a lack of qualified solar technicians in Central Tanzania. He explained that communities that transition to solar power often encounter minor technical failures and do not have access to professionals to repair them, leading the systems to be abandoned due to fixable issues. He asked us to develop a program to train local technicians in solar power.

2. Summer 2018 – Summer 2019

We wrote a manual and presentation on solar powered pumps. This training included a brief overview of circuits, and instructions on how to maintain solar panels, pumps, and wiring. It also described the most common failure modes for each of these components and how to repair them, in addition to safety tips. Additionally, we formed relationships with solar panel and pump manufacturers, which provided us with manuals and other technical materials. Over the course of this project, team members learned the basics and came out of this experience with a new understanding of the process of designing solar power, in addition to technical communication.

3. Summer 2019 assessment trip

During our 2019 assessment trip, we delivered our training in Mapinduzi, a community in which the Boston Professional Chapter had previously installed a solar pump system. This training was attended by several local water technicians, in addition to members of the Mapinduzi Water Board.

A lot of the information seemed completely new to the trainees, and the sections on operation and maintenance seemed successful. However, they had no prior knowledge of electricity, so our short overview of circuitry was not sufficient for them to understand later sections on wiring and failure modes.

4. Fall 2019 and looking forward

The Summer 2019 training showed us that the first draft of the solar training assumed too much prior knowledge of electricity. In our second draft, we are focusing on providing a more comprehensive overview of electricity that begins with the very fundamentals and builds its way up to explaining how electricity is generated from solar panels and used for pumps.

We are also planning to continue working with the local water office and other local organizations to disseminate this training. In the long term, we want training to reach as many communities as possible, which means we need local partners to deliver the presentation when we are not in Tanzania. Ultimately, we hope to ensure that any Central Tanzanian community with a solar pump knows how to repair and maintain it, so their systems can continue functioning for their intended lifespans.



Solar training in Mapinduzi with locals

MEMBER'S CORNER

By: Selma Sharaf '22

I joined MIT Engineers Without Borders my freshman fall, hoping to contribute to engineering-oriented service projects. EWB has not only provided me that opportunity, but has also played a major role in my campus involvement at MIT. After a semester as a member, I took on an exec role and have continued to appreciate the impact of this organization. I love working with fellow members to navigate challenging projects and grow as a team. Over the past year, I have been fortunate to witness the progression of many of our projects and the development of exciting, new projects. I am grateful for our dedicated team and mentors, and I look forward to continuing my involvement in EWB!

DONORS' CORNER

By: Abigail Frey '21

The end of this semester marks the end of my second year as Fundraising Lead for MIT's Chapter of EWB and I could not be more grateful to the entire MIT community for their constant support. We could not have made this trip happen without the generous donations from the Civil and Environmental Engineering Department, MIT Tau Beta Pi, and the family, friends, and alumni who believe in us and our projects. We have some big plans coming and this summer's trip was essential for making them happen.

Thank you so much!

Thank you to:
MIT Civil and Environmental Engineering
MIT Tau Beta Pi
MIT Alumni Community
MIT Undergraduate Community
Our families, friends, and supporters!

Funding for our 2019 Assessment Trip was provided by:



TRIP RECAP: Assessment Trip

By: Diego Monroy '21

This past August, in conjunction with the Boston Professional Chapter, we again travelled to Tanzania in order to conduct an assessment for the various projects our chapter is working on. We also wanted to follow up with the status of our past project, the borehole and solar pump system.

We flew into Arusha, where we met with a local foundation who had constructed a multipurpose room for a nearby school, which we could use as a baseline on various points for the room we will potentially build in the future. We then spent the majority of the trip working with the community on different projects. For the school, we conducted a complete GPS survey of the area, and gathered geographic data on all of the buildings and major landmarks.

We met with the headmaster multiple times to collect statistics on the school and its performance, problems, and needs. We also assessed the state of the Boston Professional Chapter and Harvard joint project, the new teachers' housing. We conducted soil tests with the guidance of MIT Professor Einstein, in order to determine engineering considerations for any future building site. We collected information on the electric power lines installed by the government which are beginning to be used by the school. We also met with the school committee, the governing body in charge of the school, composed of parents whose children are currently attending the school. They expressed that their opinion of the school was that it was still not good, but improving. They wanted to see more electrification for lights so that students could prepare for the exam which determines if they will go to secondary school.

The use they most hoped to see from the new building was as a vocational center. Given that Tanzania uses a single examination (with a low pass rate) to determine eligibility for further education — without even guaranteed acceptance for those who do pass — a vocational center would go a long way in improving educational prospects for people in the village, and indeed in the surrounding communities. They identified various things that might be taught at the school, and explained some of the logistics of how a class might be conducted.

We also conducted assessment for the female sanitation project by conducting several focus groups, the results of which were extremely informative and revealed the urgency of many issues faced by the women of the village.

In addition to this assessment, we travelled to the community of Mapinduzi in order to survey a solar project and borehole there, as well as conduct a training on the equipment and how to maintain solar systems. We also assessed the state of the solar system in Mkutani, as well as the COWSO that was formed in order to maintain it. During this time, we installed a water gauge to track usage as well. This trip was extremely busy, but very productive. It was wonderful to learn more about the community and connect with the people there while experiencing a new culture. We hope that the work we did will prove fruitful for the coming years.



Diego obtaining a sample for soil testing

MESSAGE FROM PRESIDENT

By: Chris Eschler '21

Serving as president of MIT's chapter of EWB for the past four months has been an incredibly rewarding experience for me. When I joined the club in my first semester here, we were just being reorganized and building up the critical momentum to successfully run a project. My predecessors, Milani and Vibha, have done a great job propelling the club to new heights, and I hope that I will be able to continue the tradition of leadership that they have established.

My transition into the president role occurred right before our summer assessment trip, so naturally there was a lot going on at the time. The two MIT EWB members that we sent as part of the travel team, Diego and Liam, worked hard to compile a list of all the information that we needed to collect in order to make the assessment trip as useful as possible to our project. We are extremely grateful for Diana Estrada, a former graduate student member of EWB MIT and current professional in EWB, as well as several Boston Professional Chapter members, all of whom provided invaluable assistance to us during this planning phase.

This academic year, we are focusing on the community's need for a multipurpose classroom to augment the school and a female health clinic to improve the standard of living for the women of the village. The mission of these projects is deeply important to me because education and gender equality are two of the most pressing needs for the people of developing nations worldwide, which is why the UN has recognized them as Sustainable Development Goals. The most general goal behind all of the work we do is to help the people of Mkutani overcome some of the obstacles that are currently barring them from reaching their true potential.

To all of our donors, I wholeheartedly thank you for your support in this mission. To our mentors, thank you for your continued willingness to guide us on our way. And last but not least, thank you to all of the club members who have contributed in so many ways to the success of our past projects, and who continue to drive onward toward the next goal.