



ENGINEERS WITHOUT BORDERS-USA
COLUMBIA UNIVERSITY
STUDENT CHAPTER

Spring 2014 Newsletter

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President's Note

Dear Friends of Engineers Without Borders,

First of all, thank you to all that made our end-of-year holiday fundraising campaign such a success! We are extremely grateful for the donations we received and how much this support will benefit our projects.

This spring semester has already been busy for CU-EWB just a short month after winter break, as our chapter has already held three events! About three weeks into the semester we held a post-travel meeting where the winter travel teams presented about their assessment trips to the chapter. We also tabled for the Columbia University student group event Glass House Rocks, where we had visitors make “water distribution systems” out of straws, and we held our annual Engineers With Barbeque event during Columbia’s Engineering Week.

Over winter break, we had very successful assessment trips in Morocco, Ghana, and Uganda. The Morocco program made some maintenance modifications to the bridge, and assessed many water sources in the area for the new water project. They also continue to educate the community on safe usage of the bridge. The Ghana team looked over the composting process at some of their latrines and further educated their communities about the benefits of the latrines as well as necessary health protocols. Finally, the Uganda program visited all of their implemented MFP sites to determine issues in their communities and possible solutions for these problems that can be explored this semester. The programs are already preparing their teams to travel abroad this summer and are working hard in preparation for their big implementation trips.

Our chapter as a whole has a busy semester ahead. We are pushing three large-scale initiatives in corporate fundraising, new member recruitment, and a high school sustainable engineering conference, all of which will be planned in the spring and carried out in the fall. During the spring, we aim to host a 5k Fundraiser while we update our online presence and outreach material.

Thank you again for your support and interest in our chapter. If you would like to reach out to us, please free to send an email to cuewbpresidents@gmail.com.

Thank you,

Gwen Pfetsch & Ritish Patnaik
Chapter Co-Presidents
Engineers Without Borders-USA Columbia University





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Uganda Program

In January 2014 a team of three Columbia undergraduates embarked on a trip to Uganda as part of an Engineers Without Borders delegation. The existing project in Uganda utilizes multi-functional platform engines to run accessory crop-processing machines. Our project aims both to minimize the distance community members travel to access similar machines as well as to encourage community development and economic prosperity. The sites implemented thus far are equipped with maize hullers, oil presses, grinding mills and some have rice polishers.

The most recent trip to Uganda was an assessment trip meant to collect information on existing sites as well as evaluate potential new sites for MFP implementation. A major objective was to collect data from each site so that future trips and implementations may be more focused and efficient. The first site visited, Sugur, is fully equipped with equipment, including a rice polisher. They reported great success in the past two months, and are overjoyed by the amount of rice they were able to process over the Christmas holiday. The second site, Okidi, is also fully equipped, and was able to experience a short period of prosperity with the MFP. However, a broken accessory part has inhibited further processing. The people of the Okidi community are slightly discouraged by this setback, but are slowly repairing their project with the help of our partner non-profit, Pilgrim. Angole, a site installed early in Summer 2013 has no major complications to report. Upon meeting with this community, our delegation decided that Angole would greatly benefit from a rice polisher. Despite their lack of a rice polisher, Angole's MFP project is slowly becoming profitable, and community members look forward to continuing the project's development. Our final site, Aboiboi, was also installed in early Summer 2013, and also lacks a rice polisher. For reasons similar to Angole, Aboiboi is struggling to attract business without being able to produce high quality rice. We anticipate that Aboiboi and Angole will become more profitable over time even without rice polishers; however, the travel team has discussed the possibility of locating funds in order to provide rice polishers for both communities.





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Additionally, as a way to monitor old sites we visited Tubur, a community implemented in 2010. Tubur has been confronted with quite a few challenges over the years, including disagreeable leadership and malfunctioning accessory processing parts. Our team noted that the type of engine installed in this community, which is outdated and perhaps short-lived, is the cause of some of the difficulties this community is having. During the most recent site implementation visits, our teams at Columbia decided to move away from the R A Lister & Co. engines, and rather to install Changfa diesel engines—a switch that has been nothing but successful. Unfortunately, Tubur was a site installed early on in the program and was given the Lister engine. The major problem they report with this engine is difficulty finding spare parts, or locating a mechanic who has experience working on a Lister engine. In the coming implementation trip, we plan to have a team return to Tubur and discuss future plans as well as to help trouble shoot both mechanical and social issues that might have stemmed from the MFP project..



In order to develop the MFP project further, the team at Columbia plans to install two new engine sites during the upcoming summer. The travel team is pleased to report that the communities of Garama and Olwa have been chosen for site implementations on the next trip. Garama and Olwa both show great promise and drive. Both communities are highly interested and have the motivation required to embark on such a project. Olwa is fortunate enough to live on government land, meaning they will never be required to pay for land, a monetary undertaking that many other communities have struggled to pay off. More than anything, the travel team is enthused to report the communities' commitment to the project's success, even in its early stages.

Overall, the Uganda chapter at Columbia is pleased with the project's development. Over time we've learned to face challenges head on. Although it is difficult to see a community struggling to process enough rice for Christmas, we are also able to see the immense successes of other communities. We hope with continued support and intervention, the MFP project becomes even more prosperous. The entire team at EWB Columbia is excited for the future of the MFP



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Ghana Program

Over the course of this winter's trip, much was accomplished in terms of monitoring and community education on maintenance of the latrines and water distribution system. For the latrines, the majority of our resources went to educational workshops and household surveys in the community. We wanted to make sure that the latrines were meeting the community's needs, and if so, the community would be able to use them effectively in the long term.

Going house to house and directly talking to the families was incredible effective in gaining a comprehensive understanding of how the latrines were functioning as part of the community. Using a translator and copious amounts of pictorial diagrams, we answered questions and explained the necessary steps for ensuring that solid waste was separated from liquid waste, and was composted effectively. Larger-scale community workshops were effective at getting community members together to discuss problems. However, getting people together at one time proved difficult, and without household surveys we would not have been able to reach as many people.



Besides education, soil quality tests were performed on the two best maintained source-separating latrines. The tests measured the maturity of compost based on carbon dioxide and ammonia release levels in the soil samples. From these tests, we found that both latrines contained compost in a moderate active stage of decomposition. The quality of the compost can be improved by letting it sit for several months to 1 year, but even without further curing, the compost is suitable for use on crops. This exciting news shows that at least two of our source-separating latrines are functioning successfully. Normally, the village would have to spend a significant fraction of their income to pump out the toxic excrement, which—even though it is being removed from the community—still has to be disposed of in some way, contributing to net buildup of waste that contaminates water sources, land, crops, and overall human health. However, with the source-separating latrines, waste is reused by turning turned into compost that can be used to improve local farming.



However, we were also faced with several challenges regarding the latrines. One latrine was half-full of water due to faulty construction. We pumped out the water, sealed up foundational cracks, and will continue to monitor the status. We dealt with other general maintenance tasks such as sealing off the unused pit of each latrine (each toilet has an unused, composting pit, and an in-use pit) and unclogging urine diverters.

In terms of water system monitoring, we made note of water usage and water level in the tank at various times throughout the day over the course of over a week. We will use this data to better understand water usage patterns in the community. Water quality tests (E. Coli, coliform, nitrates, pH, phosphorous content) were collected for Obodan water sources and sources in surrounding communities.

Lastly, we met with community leaders in two nearby villages where we were thinking of expanding our projects. Both communities were in need of more reliable, clean water sources, and one community was also requesting a health clinic. However, whether or not we will be working with these villages in the future remains to be determined by the new project team.





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Morocco Program



Ait Bayoud consists of a series of dwars, or neighborhood clusters, that are staggered along the river. Although most of the dwars have ready access to the main necessities of life, Izgouaren, a dwar isolated on a raised plateau, suffers from limited access to water. Every day, families walk back and forth down to the river to gather water from a nearby spring, spending about an hour per trip and making up to 3 trips a day. To address this issue, we sent a group of students and a US Army Corps Engineer experienced in water projects to Izgouaren during our assessment trip in winter 2013. There, the team learned about the dwar's needs, the river conditions, and Ait Bayoud's current water sourcing status. Based on their assessment, the Morocco program decided to pursue a water sourcing project in Ait Bayoud.



The most recent winter travel team went back to Izgouaren at the beginning of this year and the team was able to gather a significant amount of data about the river and various springs that come from the river. We measured the flow rate of multiple springs and of the river near Izgouaren, used GPS data to determine a piping path of water to the dwars, gathered demand data for water in the dwars, and performed water quality tests on the sources of water. Using all of the information collected during the winter trip, we plan to construct a shallow well at the main spring along the river, which will allow access to the spring. Also, we plan to carry through with piping and pumping water to the villages and create a faucet for immediate water access.



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Currently, our program is hard at work designing the various parts of our water distribution system, including the well, pipes and holding tank. A month-long trip back to Ait Bayoud is scheduled for late May once the spring semester ends. During this trip, the team will perform maintenance tasks on our completed bridge project, and will also begin excavation on 2-3 test wells. These test wells will go 20 - 30 meters deep and will ensure that there is an underground water source to tap into. Once found, many tests will be performed by the team to ensure that there is enough high-quality water for Izgouaren. Subsequent trips back to Morocco will focus on piping the water from the well up the plateau, and constructing a tower to hold the water. Overall, the Morocco program has kept the momentum from their bridge project and is working diligently to complete this next project as soon as possible to help the impoverished neighborhoods of Ait Bayoud. It sure is a busy and exciting time!





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Thank You

We would like to thank all our members, mentors and supporters that help make our many projects successful, all supporters and volunteers who helped out with the New York City Water Summit, Alumni Panel, and Days on Campus this Semester, and of course the many sponsors and grants that give us the financial support to continue our work this semester:





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Help Us Help Others

Get Involved

Looking for Both Student Members & Professional Mentors Alike! Contact the Project Managers or cu-ewb@columbia.edu

Uganda

Program Manager:
Liza Faber (lf2388@columbia.edu)

Meetings:
834 Mudd; Fridays 5:00 PM

Ghana

Program Managers:
Caitlin Fedio (caf2154@columbia.edu),
Lucas Oliver (lucas.jp.oliver@gmail.com)

Meetings:
327 Mudd; Thursdays 7:00 PM

Morocco

Program Managers:
Nicole Lewis (nicole.lewis@cuewb.org),
Devin McManus (devin.mcmanus@cuewb.org)

Meetings:
Hamilton 517, Tuesdays 8:30 pm

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Visit www.cuewb.org to learn more about online donations and to view our sponsorship pages

We appreciate all forms of contributions and thank you in advance for your generosity

Mail Checks to:

EWB-USA
4665 Nautilus Court, Ste 300
Boulder, CO 80301.

Memo Line:

Columbia University Student Chapter

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