



Fall 2015 Newsletter



ENGINEERS WITHOUT BORDERS-USA
COLUMBIA UNIVERSITY
STUDENT CHAPTER



Inside:

Presidents' Note.....	2
Ghana Program.....	3
Morocco Program.....	5
Uganda Program.....	7
Thank You!.....	9
Help Us Help Others.....	10

PRESIDENTS' NOTE

Dear Friends of Engineers Without Borders,

On behalf of the Columbia University student chapter of Engineers Without Borders, we would like to extend our warmest gratitude for your continued support. We are very fortunate to have such a strong community of passionate students, mentors, and professionals who share our mission to bring long-term solutions to developing communities, and in doing so ensure our three programs' success.

In the spring, we received the Robert D. Lilley Prize for Socially Responsible Engineering, which is an award given annually by the dean of Columbia Engineering to support an Engineering student group. We received the award for using engineering innovation to improve human quality of life. We look to continue engineering with a positive impact in our on campus community and in our partner communities abroad.

Over the summer break, three travel teams went to the project sites in Morocco, Ghana, and Uganda. The chapter now has a wide variety of projects under its purview, with a technical focus primarily on civil, mechanical, and chemical engineering. We are very proud of the tremendous work our three programs have been doing and we look forward to exciting new projects in the coming years.

This fall, EWB-CU has been hard at work recruiting new members. We had a fantastically successful New Member Bootcamp, for which the attendance was 80 people – approximately three times what was expected. We also had over 300 sign-ups at the activities fair. Our new membership is incredibly insightful and enthusiastic, and they are already making invaluable contributions to our programs.

EWB-CU has several goals for the semester. One is to broaden our presence on campus. We've made an effort to forge intergroup partnerships with other STEM and global development groups at Columbia, and are also engaging as much as possible with the non-engineering perspectives here on campus. Another one of our goals is to strengthen our fundraising campaigns. It has been very exciting to see each program's grant applications, and we hope to support them through EWB-CU-wide initiatives.

Thank you again for your continued support of our chapter. The work that EWB-CU is doing is making an impact, and the support you provide us is instrumental to our success! We hope that you will continue to support the chapter as we lead it into the coming school year.

Robert Viramontes



Sidney Perkins



Warmest regards,
Sidney Perkins & Robert Viramontes
Chapter Co-Presidents
Engineers Without Borders – USA Columbia University

GHANA PROGRAM

Obodan | Amanfrom



After observing 10 years of partnership with the village of Obodan, where we implemented a water distribution system and nine latrines, we are excited to report that we have begun work with the village of Amanfrom with a new project (in addition to transitioning out of Obodan). Our most recent trip in August consisted of the implementation of a latrine in Kwasi Doi – a satellite community of Obodan – as well as assessment work for the water supply project in Amanfrom.

Latrine Implementation – Kwasi Doi

During our January 2015 trip we discovered that the pit of the Kwasi Doi latrine was still flooding, even after attempting to seal the cracks. We came to the conclusion that the location of the latrine was the issue, and that in order to fulfill our promise to the community, we needed to replace the flooding latrine with a functioning one. This summer we implemented a new Kumasi Ventilated Improved Pit (KVIP) latrine to replace the flooded latrine. While there were a few hitches and necessary design changes once we got in country, we were able to finish construction of the latrine. We anticipate great longterm project success, as the community already knows how to maintain a latrine. In our community meetings, it was clear that they understood how to collect a fee, and the importance of keeping it clean.





Moving Forward

This semester we are thrilled to have more than doubled our membership. Our new members have already contributed greatly to our program. We look forward to working with them on the design phase of our new water project, on monitoring our past projects in Obodan, and on ever-important grant applications. We anticipate a summer 2016 trip for gathering more assessment data and monitoring the Kwasi Doi Latrine. Thank you for supporting and joining in our partnerships with the communities in Ghana!

Water Assessment – Amanfrom

Now that the community of Amanfrom has identified the need for a water system as their priority, we have a lot of assessment and design work to do before implementation. During our most recent August 2015 trip we completed several assessment tasks. This includes taking elevation data and rough GPS coordinates of important landmarks and power sources, performing yield tests on a few of the boreholes in the area, and testing the local water sources for contamination. From these tests, it has become clear to us that we will likely need to develop more than one source, as none of them have a high enough yield individually. Additionally, all of the water sources are contaminated with *E. coli* and fecal coliform, so they will have to be shocked or filtered.

One exciting development was the opening of a borehole that the community thought was dry, but was actually usable with some minimal repair. The community is still in need of more access to clean water, as many of their current sources go dry even during the wet season, but this will hopefully alleviate some of that need.



MOROCCO PROGRAM

Ait Bayoud

Ait Bayoud consist of a series of dwars, or neighborhood clusters, that are staggered along the Tagowat 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. To address this issue, we have been working for over a year performing community assessment trips to gather information about the dwar's needs, the hydrogeological conditions of the region, and Ait Bayoud's current water sourcing status. Using all of this information, the Morocco program has decided to focus our future efforts on implementing a water supply system to the community of Izgouaren and the neighboring Ilguiloda.

January 2015

This past January, we sent a travel team to the community and were successful in our efforts to drill a well as the ultimate water supply for our water project. Additionally, our travel team worked on mapping piping routes from this 140 m deep well to the planned locations for the community water storage tanks. We also performed water quality tests on water samples from other wells that tap into the same



aquifer that our well also extracts from. From these tests, we were able to conclude that through minor water treatment techniques we should be able to successfully provide the community with potable water from this source.

August 2015

During our trip this past August, we began actually implementing the water system. The water system will ultimately consist of about 1,500 meters of piping running from the well we drilled in January to a water tower in the community of Ilguiloda.



We spent the first part of our August trip building the concrete foundation for the water tower. This involved first excavating a pit that measured about 16 by 30 feet, 8 inches deep. We then surrounded the pit with a wooden frame and placed a rebar grid into it to reinforce the concrete. Finally, we mixed the concrete entirely by hand (or, more accurately, by shovel), and poured it into the pit to complete the water tower foundation.

We then focused our efforts on implementing the piping. This involved digging shallow trenches to place the pipes in, reinforcing the underside of the pipes with flat rocks and sand, burying the pipes, and laying some concrete over the parts of the piping that went under or through a road. In total, we were able to put down 300 meters of piping, bringing us about 1/5 of the way toward our goal of 1,500 meters.

Following our work on the water system, we conducted maintenance inspections on the bridge and made minor repairs. Throughout the trip, we were able to maintain excellent communication with community members – both those directly involved with project implementation and those not. We concluded the trip by discussing the project's progress thus far, and received feedback from the community on how they thought it went and what steps they'd like to see next.



Moving Forward

We have several goals for the semester, and are looking forward to collaborating with our new members on them. For the water distribution project, we'd like to create an Operations and Maintenance Guide for the pipeline, and also research wind and solar energy for the pump. On the administration side of things, we are working on grant applications, fundraising, and mentor outreach. We plan to travel again soon to implement more piping, conduct an alternative energy assessment, and work on water sanitation. Thank you to everyone who has supported us and our partnership with the community of Ait Bayoud – it would not be possible to do all of this great work without your support!

UGANDA PROGRAM

Soroti Region



It has been an exciting time for the Uganda program! In August 2015, five EWB-CU Uganda students visited project sites to meet with community members and assess the existing projects. The team specifically inspected the exhaust systems for the engines in each community implemented – specific recommendations were made to decrease unfavorable emissions and strategies have been put in place to prohibit engine exhaust from re-entering the multi-function platform (MFP) structure.

Multi-Function Platform (MFP)

EWB-CU members witnessed exciting progress made by many communities moving toward sustainable independence. As of January 2015, the community in Okidi has been debt free, due to the successful implementation of their MFP. The MFP is an agricultural processing unit that has several different attachments: a rice polisher, a maize dehuller, an oil press, and a mill. The two newest MFPs have been implemented in Olwa and Garama, and both communities have plans for economic expansion based on their profits from the new engines. The community of Sugur shows a great deal of promise, as its members are tremendously involved in committing to this project. The Orungo site touts a newly installed Chang-Fa engine, fully-functional oil press, and an alternator that charges cell phones and powers light bulbs in surrounding structures. The community turnout at Aboiboi is excellent, signaling even more enthusiasm for these projects and even more hope for the prospects of future prosperity.



To ensure future success of the Uganda program, The NGO Transportation Fund was established in early 2015. Its purpose is to provide Pilgrim Africa with the means to frequently travel to all ten sites. The funding provides for two visits to each site each month, and proposes a campaign of training and assistance for the communities. This period began in April 2015, and will run until the end of January 2016. The visits aim to address and resolve some recurring maintenance issues regarding exhaust systems and damaged MFP attachments.



For future development, the team at Columbia is excited to work with Pilgrim on monthly visits to the sites. We believe that the NGO Transportation Fund initiative has been and will continue to be effective in targeting some of the current issues faced in the communities. The EWB-CU team looks to continue suggesting maintenance schedules, savings strategies, and economically sustainable initiatives. The chapter hopes that with your continued support, the MFP project can continue to see success.



Moving Forward

As the MFP project comes to a close, EWB-CU Uganda is looking into new projects to pursue. Members are exploring current applications for projects and hope to decide in the near future! Thank you for your continued support and thank you for taking the time to read these updates!



THANK YOU!

Our work is made possible by the contributions of many:

EWB-CU's work is truly a group effort. Our program's have done wonderful work over the years, none of which would have been possible without our many contributors and supporters. We would like to thank all of our members, mentors, and supporters that help ensure the success of our projects. We would also like to thank everyone who supported and volunteered for our many events. Finally, we'd like to thank the many sponsors and grants whose financial support makes our continued work possible:



HELP US HELP OTHERS

Sponsorship and Donations

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

Donate Online:

<http://bit.ly/1OKDCIX>

Have Extra Frequent Flyer Miles?
Donate them to our chapter or individual programs! Your miles can offset our students' or mentors' travel fees and make a world of a difference.



Get Involved

We are always looking for both student members and professional mentors alike! Contact the Project Managers or cu-ewb@columbia.edu. We are in need of technical and non-technical expertise; you don't have to be an engineer to join Engineers Without Borders!

Ghana

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