



ENGINEERS WITHOUT BORDERS USA  
COLUMBIA UNIVERSITY STUDENT CHAPTER



# Spring 2015 Newsletter

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# 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 work tirelessly to ensure that our three programs are as successful as possible in their mission to bring long-term solutions to developing communities.

Over the winter 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. The completion of a bridge project, a grain-processing project, and several water projects is a testament to our past success; these projects leave the chapter excited for things to come. 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 spring, EWB-CU has been hard at work organizing a number of events and initiatives. During National Engineering Week, EWB-CU collaborated with the Engineering Student Council to serve barbeque to the Columbia community at an event called Engineers With Barbeque (EWB!). At our post-travel meeting, we communicated the recent successes of the three projects in Ghana, Morocco, and Uganda to past, present, and prospective members. By engaging with the broader Columbia community, we hope to attract talented new membership and lay the foundation for future success.

This coming April, the Columbia chapter looks forward to hosting Engineers Without Borders founder, Bernard Amedei. The opportunity to hear from someone so passionate and talented is truly something that will help our program and our members to grow.

In May, EWB-CU will be running its Second Annual 5K fundraiser. Last year, the event was a great success, with runners and walkers helping to raise over \$1,000 for EWB-CU. The chapter eagerly awaits this year's 5K and looks to continue the event long into the future!

We continue to plan for the fall semester with the hope of holding a large membership and fundraising campaign. With the recent completion of internal membership and finance audits, the chapter has identified key areas of improvement and has set out annual goals for both fundraising and membership. One such goal regards increasing membership among non-engineers, with the intent of engaging more perspectives.

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 year.

Warmest regards,

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







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# Ghana Program

After observing 10 years of partnership with the village of Obodan, where we implemented a water distribution system and nine latrines, the neighboring village of Amanfrom contacted the Ghana program during the winter of 2014 and asked us to transition to their community for our next project. Our village contacts in Obodan were able to serve as temporary liaisons between our team and Amanfrom village leaders, enabling us to gather introductory information. Our most recent trip in January consisted of the final monitoring work for the water distribution system and the latrines in Obodan, as well as the assessment work for the water supply project in Amanfrom.

Monitoring work for the water distribution system included investigation of the functionality of the system's mechanics as well as the community's management capabilities for the system. From water quality tests, it was determined that there is no *E.coli* or fecal coliform contamination in the water distribution system or in the nearby hand-pumped borehole in Obodan. The community uses about 20,000 L of water per day, primarily collected in the morning. The tanks did not run dry even during power outages and the community demonstrated excellent knowledge of how to address maintenance issues that arose. The composting pit of the pilot latrine was tested and determined to be in the mature/ideal curing phase of compost, which is safe to be handled and used as compost for wooded crops. From household surveys, it was observed that the community understands the benefits of using the latrines much better than in the past, but needed more training on how the mechanics of the latrine, such as urine diversion piping, work.







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Based on the data gathered from the monitoring trip, we decided that this will be our last monitoring trip for the water distribution system project. We also observed that the community has demonstrated sufficient knowledge and support of the latrine system to assume complete responsibility of the system. However, ongoing issues with the latrine in Kwasi Doi, a satellite community of Obodan, require us to provide a replacement latrine, so we plan to complete an implementation trip in the Summer of 2015.

Amanfrom is a centralized rural village about 40 kilometers north of Accra, Ghana, with a population of about 2,000 people. In this village, people are dependent on one well, two streams, and two springs for their domestic water supply. These water sources run dry several times a day for a three month-long dry season, and are contaminated. During this trip, the Ghana Program met with the community and Michael Mensah, the community's Assemblyman, and discussed the details of the Project Partnership Agreement. The travel team collected and tested water samples from each of the water sources, collected water usage data and conducted households surveys in order to best determine the needs and desires of the community and the shortfalls of the current system. In addition, the travel team used a GPS unit to make a rough map of the community, its water sources, and its major landmarks. The water quality testing revealed that none of the current water sources are suitable for supplying drinking water, as high levels of *E.coli* and fecal coliform were found in all of the sources.



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After the completion of January's pre-assessment trip, the CU-EWB Ghana decided to go on another assessment trip before moving on to the design phase. Technical data necessary for the design of water supply and distribution system will be collected during this second assessment trip, including the yield and recharge rates of current water sources, hydrogeological information, and complete and accurate elevation data. The Ghana program is in an exciting new phase of its history and we are grateful that you have taken the time to follow and support us along the way!





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# Morocco Program



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. 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 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 its neighboring community Iguiloda.

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.





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Our current focus has now been in designing the various components necessary to ensure successful water distribution from our current well location to the community. We have been working on sizing pumps for our new well, designing water filtration systems to ensure safe potable water, sourcing temporary water tanks to store the treated water near our communities, and making a strong fundraising push to fund all of these infrastructural design requirements. We plan to send a travel team to Ait Bayoud this upcoming August to begin piping from our well toward the community, so that we can begin to realize the ultimate goal of supplying them with a reliable potable water source.

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# Uganda Program

It has been an exciting time for the Uganda program! In January 2015, three EWB-CU Uganda students visited project sites to meet with community members and assess the existing projects. In the weeks after the travel team's return, the installation of the tenth and final MFP was finalized. The team has now moved into a phase of monitoring and supporting Pilgrim Africa, EWB-CU Uganda's partner NGO. We continue to upgrade old equipment used in the MFPs and we continue to innovate solutions to current challenges.



The projects in Uganda not only show exciting promise, they also have proved to be successful. As of January 2015, the community in Okidi has been debt free, due to the successful implementation of their MFP. Two new MFP implementations are underway at the sites of Garama and Olwa, and both communities are excited to begin using these devices. Moreover, the community of Sugur shows a great deal of promise, as its members are tremendously involved in committing to this project. We are very pleased to report that the maintenance practices currently in place in the Tabur community are exemplary. The program is identifying ways to spread these best practices to some of the other project sites. The Orungo site touts a fully-functional oil press, and their MFP has promoted trade and encouraged community members to start their own ventures. Competing processing sites have also been inspired to open up in the area. The community turnout at Aboiboi was excellent, signaling even more enthusiasm for these projects and even more hope for the prospects of future prosperity.





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The Uganda program continues to troubleshoot issues with some of the MFPs in Tabur, Angole, Anyara, and Usuk relating to equipment failures and sustained damage to exhaust pipes. The enthusiasm of the people in these communities is a promising sign that solutions will be identified, designed, and implemented, and that the projects will be successful in the long run.

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 will run from April 2015 to the end of January 2016. The visits aim to address and resolve some of the 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 will be effective in targeting some of the current issues. In the coming months, we look forward to addressing many of these technical and social challenges. The chapter hopes that with your continued support, the MFP project can continue to see success. Thank you for your past support and thank you for taking time to read about our exciting updates!





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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 all of our events, 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

## Sponsorship and Donations

Visit [www.cuewb.org](http://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

**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](mailto: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

Project Manager:

Christine Djan ([cdjan27@gmail.com](mailto:cdjan27@gmail.com))

Leerang Yang ([leerang.yang@gmail.com](mailto:leerang.yang@gmail.com))

Meetings:

Tuesdays @ 8:00 pm (Hamilton 511)

### Morocco

Project Manager:

Eric Simmons ([es3188@columbia.edu](mailto:es3188@columbia.edu))

Niger Little-Poole ([nl2418@columbia.edu](mailto:nl2418@columbia.edu))

Meetings:

Tuesdays @ 8:30 pm (Hamilton 603)

### Uganda

Project Manager:

Ben Drachman ([bld2128@columbia.edu](mailto:bld2128@columbia.edu))

Meetings:

Fridays @ 5:00 pm (Mudd 834)