



Summer 2017 Newsletter

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PRESIDENTS' NOTE



Anna Li



Evan Spotte-Smith

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. Together, with the support of students, alumni, mentors, and professionals who dedicate an invaluable amount of time and effort, we continue to grow as a chapter comprised of three large programs passionate about bringing long-term solutions to developing communities.

Over the winter break, the Morocco program travel team tested the state of the water distribution system in Ait Bayoud by testing the quality of the piping and the water, while revisiting the bridge for inspection and further improvements. The other two programs, Ghana and Uganda, continued planning for their projects. The Uganda program began planning for the first two trips to assess their new power generation and distribution project in the Orungo Sub-County. The Ghana program continued planning for their gravity-fed water distribution system in Amanfrom, similar to their previously implemented water sourcing system in Obodan.

In addition to all of the project planning in preparation for the summer travel teams, this spring, EWB-CU has been planning a number of events

and undertaking a number of initiatives. Our annual 5K fundraiser took place in April. At the end of the semester, EWB-CU said farewell at the annual Senior-Mentor dinner. While a number of our members are moving on to continue their studies or pursue careers, we hope that they continue to work with EWB-CU, mentoring our younger members, providing technical guidance, or supporting our work in other ways. We have been working with the Columbia Engineering Alumni Association to help organize Engineering Icons: Bernard Amadei. This coming September, we will be hosting Engineers Without Borders founder, Bernard Amadei. The opportunity to hear from someone so passionate and talented is certainly something our chapter looks forward to, and formally extend an invitation for all those involved in CU-EWB to attend.

Over the summer, all three programs traveled to continue work on their respective projects. We look forward to hearing all about what they accomplish in their communities as we transition back into the fall semester.

Thank you again for your continued support of the 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.

Warmest regards,

Anna Li & Evan Spotte-Smith
Chapter Co-Presidents
Engineers Without Borders - Columbia

Ghana Program

Since completing our projects in Obodan (a water distribution system and latrines) we have been focusing our efforts towards the community of Amanfrom, a town nearby to Obodan. Amanfrom is a centralized rural village about 40 kilometers north of Accra, Ghana, with a population of about 2,000 people. Before our implementation trip, people were 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 with E.coli and pesticides. The two new wells are located on the south side of the village and are in a much more accessible area than the other water options.

Community leaders contacted the Ghana program during the winter of 2014 and asked us to help 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. In both the winter and summer assessment trips to Ghana in 2015, teams focused on determining the need of the community and gathering data for implementing. In the August 2016 trip, five students and a mentor traveled to Amanfrom and drilled two boreholes, the Primary School Well and the Borzey House Well. Each of these wells were equipped with a submersible pump and a small tank distribution system. At the end of the three-week trip, the travel team handed the system over to the community. This past summer, members of the Ghana chapter traveled to Amanfrom to monitor and evaluate the implemented system.





This year's trip had five initial goals; perform pump tests, install a new tank at the Primary School Well, conduct water quality tests, survey the community, and build concrete pads around the borehole to prevent surface water contamination. First, we hired a local borehole company to come and perform a pump test. We collected data on the wells' drawdown and yield that can be analyzed during the upcoming semester. Second, the Primary School Well needed a new tank because in an effort to conserve resources during implementation, an apparently abandoned water tank from another NGO's failing project was repurposed to fit our system. Unfortunately, the NGO later returned and reclaimed the tank earlier this year. The travel team purchased and set up a new tank, allowing villagers to get water from that well again. Two different water quality tests were performed on each well, both chemical and bacterial. We have received the chemical test results so far, and the specifications meet WHO and Ghanaian water quality standards. From the community surveys, it seems as if people on the south end of the community rely on the wells, but the more

northern residents think that it is too far away and are choosing to frequent a closer water source. We also received feedback that community members have to wait in long lines to get water from the boreholes and sometimes the tank runs out before everyone can receive water. This is an indication that the two wells cannot support the entire community, and the team will be assessing potential methods to increase the volume of water available. Finally, we successfully built two 4 sq. meter pads around the opening of the boreholes to prevent any contamination.

When the travel team arrived in Amanfrom, we met with the Elders and the Unit Committee. The community leadership explained their current system for collecting fees at the wells, and together the leadership and travel team determined that it was not the most effective arrangement. Later in the trip, we organized a brainstorming session for the community leadership to determine a financial system that they find effective and fair. After coming up with several plans in small groups, the leadership discussed the merits of each of their plans and eventually settled upon a new system. We believe this new system will provide a healthy maintenance fund to support the water project in the future. We also received the 5% contribution for the initial project from the District Assembly. With this community contribution, we were able to install two new electric meters and send water samples to a local water institute for pesticide testing.

We are very happy with the way our current project is going and we look forward to another great semester! Last year we saw an increase in membership and hope to continue that trend. We will be focusing on evaluating the data that we collected during this trip and assessing the current needs of the community. We appreciate all of the support you have given to the Ghana program. Thank you!

Morocco Program

CU-EWB Morocco was founded in December 2010 when Columbia alumna and Peace Corps Volunteer Nina Morency-Brassard reached out to CU-EWB with a potential project in Ait Bayoud, Morocco. Ait Bayoud consists of a series of dwars, or neighborhood clusters, that are staggered along the Tagawwt River. During the rainy season, the Tagawwt River consistently floods for several weeks, and isolates communities in the rural Northern Bank of Ait Bayoud from the schools, markets and clinic located on the more developed Southern Bank. In order to join the North and South Banks of Ait Bayoud we partnered with local leaders in Ait Bayoud and the Peace Corps to construct the world's longest high-density polymer, simple suspension footbridge. Following its completion in June 2013, CU-EWB Morocco continues to perform maintenance and inspect the bridge and has been working with residents from Ait Bayoud to transfer full ownership to the community.

From the existing bridge partnership with Ait Bayoud, CU-EWB Morocco created a new partnership with Izgouaren and Ilguiloda, two dwars (villages) in Ait Bayoud, shifting its focus towards satisfying a need for potable water. Although most of the dwars have ready access to the main necessities of



life, Izgouaren, a dwarf 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, CU-EWB Morocco has designed and is in the process of implementing a water supply system to Izgouaren and its neighboring community Ilguiloda. This system, when completed, will consist of a source well, a 1.8 mile long galvanized steel pipeline, and water tanks from which the community can draw filtered, potable water. To date, travel teams have drilled a source well, installed a pump, and completed approximately one-third of the galvanized steel pipeline. Water has been pumped out from the well on several trips for testing the pipeline for leaks and testing water quality.

Most recently, the August 2017 travel team set up a temporary sedimentation system and water distribution site to provide the surrounding communities with immediate access to water while the pipeline remains in-progress. As a part of bridge maintenance, the team also installed and tensioned a new hand rope on the footbridge with the help of community members.

Moving Forward:

Our current focus on campus for the water project is to continue solving leaks in the pipeline and assessing different permanent methods of groundwater filtration. Our bridge team will plan for the incorporation of the tensioned hand rope installed this past trip and continue transitioning maintenance responsibilities to the local villagers. The program as a whole will also build on initiatives started last semester to expand our fundraising efforts. In country, our partners in the Peace Corps will source and purchase a generator to provide a power source for the temporary distribution site. We are excited to continue working towards our goal of supplying Izgouaren and Ilguiloda with a permanent source of potable water, and we thank you for your continued support of the Morocco project and our partnership with Ait Bayoud!



Uganda Program



The Uganda Program is excited to begin work on our new rural electrification project that was approved over the summer of 2017. The project will take place in the community of Orungo, which displayed tremendous success while working with EWB-CU team members on the Multi-Function Platform project. Orungo community members first mentioned a desire for electrification in local homes and businesses during the program's trip in the summer of 2015. We have since collaborated with



Professor Vijay Modi and his team members at Columbia's Sustainable Engineering Lab to learn more about their model for electrification using solar energy. Professor Modi's projects utilize a software and hardware solution to the problem of distributing affordable electricity to people in agricultural communities. We are considering establishing a similar model in Orungo that focuses on locally sourced equipment for accessible,



affordable energy. Five EWB-CU students traveled to Uganda in August 2017 and were able to stay with our partners in Orungo and learn more specifically about community members' needs and desires for an electrification system.

The August Team visited multiple trading centers to establish which site would be best suited to an electrification system. These visits focused on determining the basic demographics of the centers and the demand and utility for electrification. The

team was able to recommend two viable project options within the Orungo region. The first would be to implement a solar microgrid near a trading center with a health clinic and two schools in close proximity. The second involves the installation of a solar powered water pump to create a more efficient system for the collection and distribution of water. Through discussions with many community stakeholders, the August Team saw a very strong demand for an electrification system. The August Team also assessed the locally available equipment, and was satisfied with the quality of the equipment and local knowledge of mechanical and electrical processes. We are excited to move into project design and implementation of the electrification system in the coming months.



The Uganda program continues to monitor and evaluate our Multi-Function Platform project that is currently operating in 8 different communities in Soroti and surrounding districts. During the summer of 2016, our partners at Pilgrim Africa installed a new engine in the community of Tubur to replace the original engine as replacement parts were unavailable for the original model. Four EWB-CU students traveled in May 2017 to evaluate the progress of Tubur and our other communities. In many sites, old equipment has been updated and operators are working to keep surrounding structures free of particulate matter and maintain their own health by wearing filtered masks during operation. We continue to advise the communities in practices that will enhance the economic success of the project while keeping community members and the environment safe and healthy. We would like to thank you for your continued support for our program and for taking the time to read about our exciting project developments!



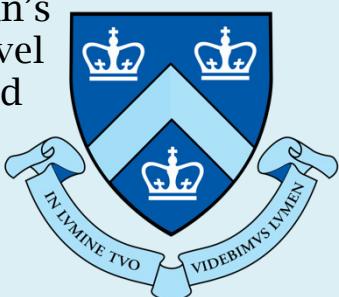
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THANK YOU!

EWB-CU's work is truly a group effort. Our programs' 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:

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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.

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Graduating Seniors and Alumni: Please fill out the google form exit interview linked below.

<https://goo.gl/forms/nupJQvoW0HAVROpm1>

Donate Online:

<https://support.ewb-usa.org/fundraise?fcid=713453>

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.



Mail Checks to:

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

Memo Line: Columbia University Student Chapter

Get Involved

We are always looking for both student members and professional mentors alike! Contact the Project Managers or cu-ewb@columbia.edu to find out where and when we are meeting this semester.

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:
Juliet Brown Kirk
(jbk2164@columbia.edu)
John-Michael D'Andrea
(jd3172@columbia.edu)

Morocco

Project Manager:
Anne Gergen
(apg2151@columbia.edu)
Kristen Wang
(kqw2102@columbia.edu)

Uganda

Project Managers:
Rebecca Miller
(rlm2180@columbia.edu)
Sayaan Nawaz
(smn2164@columbia.edu)

DR. BERNARD AMADEI CAMPUS VISIT

When: Thursday, Sept. 28th from 3-4pm

Where: Davis Auditorium, CEPSR 530 W 120th St New York, NY 10027

Dean Mary C. Boyce cordially invites you to a conversation with Bernard Amadei. Dr. Amadei is the Founding President of Engineers Without Borders-USA and the co-founder of the Engineers Without Borders-International network. Dr. Amadei is Professor of Civil Engineering at the University of Colorado at Boulder, and author of the Engineering for Sustainable Human Development.

The conversation will feature a discussion with Dr. Amadei about his vision for engineering and how it can affect social change. The session will conclude with time for questions from the audience.

Following the talk, we will host a special reception with Dr. Amadei for a limited number of current students. Space at the reception will be done via lottery. Students may register for the lottery when they register for a ticket to the lecture. Winners will be notified of their spot two (2) days prior to the event and will be required to confirm attendance.

Space is limited! Tickets are on a first come, first served basis. A wait list will be available when necessary.

Register for the lecture and learn more about the event through the following link:
<https://www.eventbrite.com/e/engineering-icons-bernard-amadei-tickets-37213578816>

