



ENGINEERS WITHOUT BORDERS-USA
COLUMBIA UNIVERSITY
STUDENT CHAPTER

Spring 2011

GHANA



EWB-USA supports community-driven development programs worldwide by collaborating with local partners to design and implement sustainable engineering projects, while creating transformative experiences and responsible leaders.

UGANDA



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MOROCCO



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**EWB-USA Columbia
University Members
at the 2011
International
Conference held in
Louisville, Kentucky**



*From left to right:
Top:
Jackie Ho, Allison
Duh, Daron Lin,
Julio Herrera,
Claudia Vargas,
Kevin Ma, Eric
Chen.*

***Bottom:**
Kristina Lee,
Monica Agarwal,
Kerri Sidebottom,
Derek Huang*

Dear Friends of Engineers Without Borders,

We are very excited to update you--our friends, supporters, alumni, colleagues-- on the latest endeavors that the Columbia University chapter of Engineers Without Borders has undertaken over the course of the past semester. It is our hope to share with you our passion, enthusiasm and excitement for our work in developing countries.

The past few months have been full of change and progress. Most notably, this past December marks the closure of the India Program within our chapter. Over the last 5 years, the group has worked on developing improved wood-burning cook stoves and successfully implemented a micro-hydro power generator in the Kalahandi district of India. Now, taking the next step to continue our mission, we are very happy to welcome the Morocco Program to our chapter.

We are also very excited to have been selected as the hosts of the EWB-USA Northeast Regional Workshop next fall at Columbia University. Essentially this is a weekend-long conference where students, professionals, and corporations from the region will come together to discuss sustainability, learn practical engineering skills and network with each other. We are expecting about 400 participants from all across the region and will be working diligently over the course of the next few months to make it as great as possible. We hope to see you all there!

As we continue to reach new milestones in the work we have undertaken, we ask that you join us in wishing our three programs safe travels this summer as they dedicate their time to serving our communities abroad. We look forward to seeing what heights our organization can reach in the future, and updating you on our achievements as they transpire.

All the best,
Kevin Ma and Claudia Vargas
Co-Presidents
Engineers Without Borders-USA Columbia University Student Chapter

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A Villager using the MFP to generate electricity and mill



Community members and EWB-USA CU members working together

Perfecting the MFP – Implementing the Rainwater-Harvesting System

By Birger Henning & Julio Estrada

The past two and a half decades have been harsh for the Soroti district and larger Teso region in Uganda, due to several rebel insurgencies, regional conflicts, cattle raids and severe flooding in 2007. Engineers Without Borders-USA Columbia University Uganda Program has worked with Ugandan NGO, Pilgrim, since 2007 implementing the Multi-functional Platform (MFP) pilot program in this region. An MFP is a Listeroid diesel engine, mounted on a fixed frame, which can be attached to various agricultural processing units and generators via a pulley system and has proven to be an effective solution for agricultural and energy issues.

In May 2010, our program increased the capacity of the MFP by working with a local electrician to install small-scale power grids and battery charging stations at each site. In January, 2011, Pilgrim and Makerere University installed two additional MFPs in the Tubur and Anyara sub-counties of Uganda.

During an assessment trip in the summer of 2009, Pilgrim identified the need to repair the rainwater-harvesting system of their

boarding school, Beacon of Hope College. This school serves over 500 high school-aged students along with staff and teachers. In the summers of 2009 and 2010, groups of students from EWB-USA CU Uganda traveled to Uganda and conducted a specific assessment trips to analyze the problem and take measurements of sources reliability, water pricing, water quality, amongst other important factors to consider. School administration preferred to simply repair the existing water system and to install two more, so as to not increase the school's monthly water bill. This past semester we concluded the design for the entire rainwater-harvesting system, including the tank sizing, gutters, first-flush, and water treatment.

In June 2011, members of the chapter are returning to the MFP sites to implement a Cyclone Overflow Exhaust System (COES), designed to reduce the amount of excess flour being released into the MFP structures as a result of milling. Respiratory complications and mechanical damage at each site will hopefully be avoided. Our team will also be implementing the three rainwater-harvesting systems. We wish them Godspeed.



Ghanaian children at play



Pilot Source-Separated Latrine Constructed in Summer 2010

“Poo Power” Potential to be determined in Source-Separated Latrine

By Kelly Wu

The EWB-USA CU Ghana Program centers its work on the community of Obodan, Ghana, a small subsistence farming community of approximately 1,500 residents in the Akuapem South District of the Eastern Region. Economically, the community is largely dependent on agriculture, with many of the people being independent on their own means. The Ghana program began in late 2004 with a team assessing and surveying the community, pinpointing an issue of public sanitation. The team constructed a KVIP in 2005, but realized later that the original KVIP was not an ideal long-term solution due to its strong odors and high maintenance costs.

This past summer in 2010, EWB-USA CU Ghana implemented a pilot source-separated latrine and began construction on another to be completed this summer in 2011. The source separated latrine utilized a special toilet seat to separate the liquid and solid waste. Because of the lack of cross-contamination between waste types, this latrine system has no maintenance cost, reduces pathogens,

and produces odorless waste—nutrient-rich urine that can be used as fertilizer and solid waste with many energy possibilities. The team’s most recent trip occurred in January 2011 where both urine and solid waste samples were collected and analyzed for contamination and nutrient value. They also presented to the Ghanaian engineering community in Accra along with University of Wisconsin’s EWB-USA chapter to discuss future directions and educational values of the Obodan community. Ongoing research in Columbia University’s labs are looking to harness the “poo power” and potentially collect biogas, an alternative form of energy, from the solid waste. Assessment was also done for a water-distribution system to provide the community with clean water from the community’s only two borehole water source.

For Summer 2011, the latrine project will be expanded. Simultaneously, the team will be undergoing further assessments in order to build their water-distribution system in the near future.



Columbia Takes First Steps Towards Morocco

By Cedric Cogell

Engineers Without Borders-USA has just recognized a team of students to begin work in Morocco, giving the EWB-USA Columbia University chapter its third program. This is the first EWB-USA program in Morocco.

In December 2010, Nina Morency-Brassard, a Columbia alumna and Peace Corps volunteer, reached out to EWB-USA CU with a collaborative project proposal. Residents of Ait Bayoud, a small rural community in the southern region of Morocco expressed certain needs to Nina who is working in the area.

The most pressing disruption to the quality of life is due to a river that floods during the rainy season. For three months a community of dwarfs, small villages, of nearly five-thousand is severed by the raging river. Villagers are left without ready access to fresh food, medicine, health care, and education. In addition commerce and basic communication is interrupted during this extended period. Students within EWB-USA-CU began to discuss the viability of a footbridge.

In July 2011, five members of the team will fly to Morocco for the first assessment trip. The first trip is of utmost importance for its social implications. The team must facilitate, in two weeks across cultural and language barriers, a relationship with the community and its leaders. In addition to surveying possible bridge sites and taking topological data, soil samples, and water data, the travel team will simultaneously be forming relationships with the local villagers and the Association du Développement d'Ait Bayoud, the community body overseeing development in the village.

The Morocco team will spend at least five years in the region. Later this year, the program plans to send a second assessment team to observe the river during the flooding season. With the combined support of faculty, professionals, and the national chapter, the team is wildly excited to begin work to improve the quality of life in Ait Bayoud.



CHAPTER UPDATES



The EWB-USA CU Ghana Team members with New York Times writer Andrew Revkin

Ghana Program Featured on PBS Earth Day Special – Planet Forward

This past February, the EWB-USA Columbia University Ghana Program was among the 3 winners from among 22 nominees to be featured on the PBS Planet Forward show for Earth Week. All nominees submitted video describing how their individual or team projects worked along the ideas of sustainability.

The Ghana team depicted their project by breaking out their voices and ukuleles. Its video was second place by number of votes and had the highest amount of Youtube views among all submissions.

Additionally, they were one of the *Editor's Pick*. Members from the program were fortunate enough to be able to attend the live viewing of the episode that was aired nationally in August. Check out <http://planetforward.org/> for more information.



From left to right: Claire Wang, Lili Jiang, Professor Chandran, Suraj Cheema at the Live Taping

A Special Honor – EWB-USA CU to host the Northeast Regional Workshop

This past April, EWB-USA Columbia University was selected to host the Northeast Regional Workshop for EWB-USA.

This is an annual workshop where members from the Northeast regional convene to discuss ideas ranging from mixing cement to international development, constructively critique others' projects, and talk to professionals and students in their fields.

Our chapter is excited and honored to receive this opportunity and expect approximately 400+ students and professionals from the Northeast area to attend.



EWB-USA CU Members at the 2010 Northeast Regional Workshop held in Pittsburgh



HELP US HELP OTHERS

Get Involved

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

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Northeast Regional Workshop

Email NERW2011@gmail to :

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Host a table at the Professional Exhibition

Present on a technical topic

Extra Frequent Flyer Miles ?

Donate them to our chapter or individual programs. Your miles can offset a student's or mentor's travel fees and make a world of difference

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