



ENGINEERS WITHOUT BORDERS USA  
Columbia University Chapter

# SPRING 2020

## NEWSLETTER



ENGINEERING WITH A PURPOSE



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# PRESIDENTS' NOTES



MICHAEL COUCH



SOPHIE  
REESE-WIRPSA

## Dear Friends of Engineers Without Borders,

On behalf of the Columbia University chapter of Engineers Without Borders, we would like to extend to you our warmest gratitude. The strong support of our students, mentors, and professionals continues to contribute to the great successes we have seen in our three international sustainable development projects. Building a better world starts when we work together, and we would like to thank you for your generous support.

At the start of the new year, members from the Ghana team touched down in Amanfro to monitor the water filtration and distribution project and continue building their long-term, community partnerships. The Uganda program has continued planning for their next trip to monitor their solar power generation and distribution project after expanding it in August. The Morocco program is

preparing their next steps for their gravity-fed water distribution system in Ait Bayoud. You can read more updates from the Program Managers below.

This spring brought many changes to our lives all around the world, including on campus. After transitioning to remote learning, all three of our programs were able to continue meeting virtually and planning for the futures of their projects. Each program had set their plans for summer travel this year, but, in light of the increasing risk to travelers and community partners, have chosen to postpone them for the future. While we are uncertain of when our teams will be able to safely travel again, we are incredibly proud of the resilience and efforts we have seen from all of our members. Our projects continue to communicate with their community partners, checking in on their health and trying to continue implementation/assessment remotely.

Despite all of the changes, this was one of our best semesters yet! Prior to the cancellation of in-person classes, our chapter had been looking forward to hosting the EWB-USA Stronger Together 2020 New York City Regional Conference in March. It sought to bring together 200+ students and professionals for hands-on workshops, skills training, and keynote speeches from the President of Thornton Tomasetti, Raymond Daddazio, and a leader in public health in developing communities, Dr. Marni Sommer. Under these circumstances, we had to indefinitely postpone the conference, but by partnering with EWB-USA, we have been able to offer virtual workshops in its place. We are beyond grateful for the support we received in planning it all from our members on campus and from the professional chapters.

None of the work we do would be possible without generous support from our sponsors, and we would like to highlight their impact this year. For the first time, two of our programs received sponsorship for the summer from Columbia's Alternative Break Program. Additionally, the Morocco program was nominated for funding from the Davis Projects for Peace, building upon the successes of Ghana's 2019 award. Each program has also been working on their own, project-related sponsors to assist along the way.

Looking ahead, we believe the COVID-19 pandemic serves as an important reminder for the value of the work we do through Engineers Without Borders. We continue to plan for the fall semester with the hope of continuing this year's growth in membership and presence on campus. While many challenges lay before us, we are confident our chapter can provide aspiring engineers and students opportunities — either virtually or in-person — to learn more about the value of sustainable development and engineering for humanity. We hope that you will continue to support us as we build a better world, one community at a time.

**Sincerely,**

**Michael Couch & Sophie Reese-Wirpsa**

***Co-Presidents of CU-EWB***



# GHANA

The Ghana Program is heading into the fifth year of our partnership with the community of Amanfro, Ghana, a rural village roughly 40 kilometers north of the capital of Accra with a population of about 3000 people. Jointly, our goal is to increase access to and reliability of potable water for the community. Eventually, we aim to meet and exceed the World Health Organization standard of 50 L of potable

water per person per day for drinking, cooking, and personal hygiene. Over the course of our partnership, we have assisted in the drilling of 4 boreholes in the community, two of which were drilled in 2016 and two in 2018. However, as of August 2019, only the borehole located at the Junior High School (one of the two drilled in 2018) was still in operation.



This January 2020, a team of Ghana Program members and mentors traveled to Amanfro with two main objectives: to reopen the two southern boreholes that were drilled in 2016, and establish a new, unified Water & Sanitation (WATSAN) Committee of community members. The boreholes needed to be retrofitted with hand pumps in order to be reopened, as the previously placed electric pumps were too powerful and caused dry pumping. After receiving favorable water quality results, the team moved forward with the installation, working with local contractors, community masons and other volunteer laborers. To prepare for installation, the old well aprons were demolished, and new concrete platforms were constructed around each borehole, with the hand pump stands anchored in. One hand pump was installed in February and that borehole was successfully reopened to the public for full use. There is currently a regional shortage of the specific hand pump model for the other borehole, however we expect to be able to continue with installation soon.

Most notably, in conjunction with one of our local partner organizations — the Community Water and Sanitation Agency — the team organized a large community meeting in which a new WATSAN committee was successfully formed. Passionate community involvement in the election, and a productive ‘Vision Activity’ with the committee, are both good indications that the new committee will stick and provide some stability for the continuation of the project in the future. Additionally, the team conducted household surveys and interviews in order to better gauge water usage trends and understanding of the project amongst the community. These surveys indicated that much of the community still relies on streams and hand-dug well sources, which have consistently tested positive for bacteriological contamination. In response, the team constructed a ‘proof of concept’ household Bio-sand filter that we are monitoring remotely.



### Looking Forward

Going forward, we will be transitioning into the third phase of this project with implementation of a pilot program for the Bio-sand filters. The program will be coordinated through the WATSAN committee, as we aim to engage them more deeply in the project and foster a greater sense of community ownership.

Since the beginning of the coronavirus pandemic, the Ghana Program has been maintaining consistent communication with community leaders. We asked the WATSAN committee a variety of questions concerning the community's knowledge of the pandemic and the current measures being taken to slow the spread of coronavirus.

We were pleased to hear that there seems to be a general awareness of the crisis and that the community is engaging in activities such as increased handwashing and social distancing.

As a result of the pandemic, it is uncertain when we will next be able to travel to Amanfro to implement our biosand filter project. In the meantime, however, the Ghana Program will continue to plan for eventual implementation as well as continue to maintain communication with the community to preserve the relationship that we have built with them over the past five years.

### Authors:

**Julie Raiff & Meryl Winicov**  
*Ghana Program Managers*



# MOROCCO

On behalf of the program, we'd like to thank you for your continued support and interest in our projects. This past semester has challenged our group in ways we have never been before. From finding new ways to work effectively while we are spread across the country, to being faced with the impacts that COVID-19 has had on the needs of the

communities we work with, these unprecedented times have pushed us to adapt in many ways. Even in these times, our program has continued to grow and develop, ultimately showcasing our resilience as a group as we continue to work together to bring potable water to the commune of Ait Bayoud, Morocco.



Over the past semester, we've worked tirelessly in finalizing designs that will ultimately complete our water distribution system. We have not only finalized plans for the extension of our pipeline to the further village of Izgouaren, but also for additions to the system including the expansion of water capacity through the addition of a second concrete storage tank and the improvement on water quality with a slow sand filtration system. We have continued cultivating valuable relationships with our recent alums and professional mentors, who have shaped and guided these technical design efforts. Each of these mentors has contributed significantly to our ability to create sustainable and effective solutions to the various technical problems we have faced, and we cannot thank them enough for their help.

While we were eager to complete construction this summer, we are all understanding of the constraints necessitated by the ongoing global pandemic and are instead looking forward

to conducting remote implementation this summer and shifting construction to later dates. This remote implementation is especially important as hygiene concerns arising from the current global pandemic mean that our communities are more in need of clean water to wash their hands and homes than ever. Some community members have stated that the amount of water that they need has almost doubled. However, disputes regarding water access have put the reliability of the system in jeopardy. To aid this, during remote implementation this summer, we plan to address concerns within the community regarding disputes over water usage and the restoration of the Ait Bayoud Water Association to ensure that these conflicts have a reliable governing body with a legal grounding, in order to make sure that no one person can prevent other community members from gaining access to water. We also aim to work with community partners to undergo remote water testing, in order to avoid delaying results that might necessitate changes to our system.



Given an appropriate public health climate, it is our hope to travel this winter to begin construction. Tasks to be targeted on this potential trip include the updating of the tapstands at Ilguiloda to include better drainage solutions, construction of new tapstands at Izgouaren, and construction of a break pressure tank. There is also a lot of community work we hope to do on this trip, cementing the Water Association and working collaboratively with the community to ensure its effectiveness, as well as beginning to do some demographic surveying to get a better sense of our impacts, as well as any concerns regarding the system we need to take into account. The following summer, we hope to extend the pipeline completely to Izgouaren, build a second storage tank fitted with a slow sand filter, and continue to bolster all community relations. Our program has achieved so much in the past year, but there is certainly no shortage of work remaining and we are incredibly grateful for all of your continued support as we navigate our future implementations.

In addition to our hard work on the project itself, our program has also taken on initiatives to spread the word about our successes through various professional channels. Our bridge team has continued work on a research paper analyzing our novel suspension bridge with the hope that we can shed light on its capabilities as a bridge type. They have also been interviewed regarding the bridge and will be featured in an upcoming issue of Transport Engineer magazine. Additionally, representatives of CU-EWB Morocco are slated to present at the upcoming PPXX conference in Amsterdam this year regarding the potential for HDPE to be used in humanitarian projects. For this, we are preparing a research paper and presentation in which we showcase our project as a case study, in the hopes of inspiring some of the industry leaders present at the conference to invest further in the fight against water scarcity.

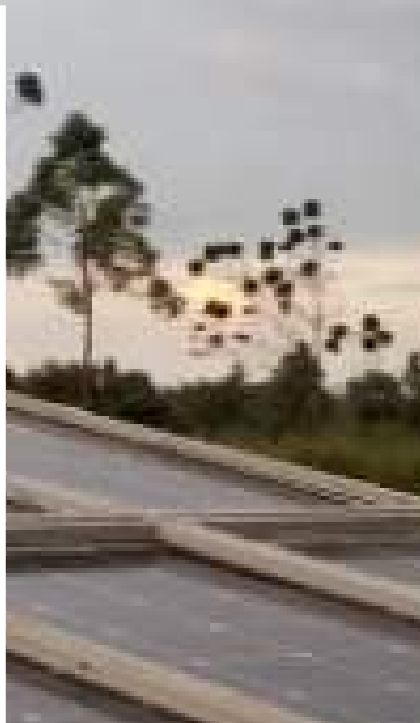


All of these endeavours are incredible opportunities for members of our club to take our impact beyond the communities we work with, and we are so grateful for all of the industry members who continue to support our program.

All in all, this semester, we were challenged in ways we haven't been before, both within our program itself, with our project, and ultimately as individuals continuing to navigate a rapidly changing world. Even still our program has persisted, rising to meet the many challenges we have faced. At the heart of this is the relentless pursuit of positive change imbued in all of our program members. We hope to continue this pursuit in the coming year to create a sustainable system that serves the community for many years to come.

Our successes this semester would not have been possible without our team, translators, mentors, and most importantly, the community members who continue to share with us their labor, homes, and their hospitality. We would like to thank everyone who has been cheering us on in this process. We hope you are as excited as we are to see the Ilguiloda & Izgouaren Water Project making great strides this year. Our upcoming implementation trips will continue to be of a large scale, so we warmly welcome any contributions that you can make to our project at our donation page here. Thank you for your continued support of the Morocco program and the communities in Ait Bayoud! We hope to make you all proud.

**Author:**  
**Leanne Pichay**  
**Morocco Program Manager**



## UGANDA

The Uganda program of CU-EWB began in 2008 with the Multifunctional Platform (MFP) projects in 8 rural communities in eastern Uganda. These MFPs were built to make the processing of grains and other crops more efficient for the agricultural communities. During this project, CU-EWB Uganda began our partnership with Pilgrim Africa. Alongside Pilgrim, we have implemented a Rainwater Harvesting project at the NGO's Beacon of

Hope Secondary School in Soroti. After the completion of both of these projects, CU-EWB Uganda and Pilgrim Africa have embarked on a Rural Electrification project in Otubet Parish. As of May 2020, CU-EWB Uganda has implemented systems at two primary schools, the community medical center, and 33 businesses in the town center.



These systems, installed in 2018 and 2019, power lighting at the businesses and lighting and power sockets at the primary schools and medical center. The primary schools and the medical center were also provided laptops, with the medical center receiving an electric microscope. During the first implementation trip in 2018, the benefactors of the project elected a governing board to oversee the system.

The Rural Electrification project is currently in the monitoring and evaluation phase of our project. After traveling during the summer of 2019, our team has decided to take a step back from implementation in order to focus on community development to ensure the financial and overall sustainability of the project. The most challenging aspect of our project has been conveying the importance of the community contribution mandated by EWB-USA. The community contribution is an EWB-USA policy that requires the community to “buy into” the project and raise 5% of the

prepares the community to raise funds when the system inevitably needs repairs.

In the past, the program boards have not collected this contribution, leading EWB-USA and our current board to the conclusion that the project, as it stands, is not financially sustainable. Additionally, after our most recent trip, the system that was implemented in 2019 has not been functioning as designed. Over the next couple of years, the Uganda program will be focusing on repairing the existing systems as we gather more information on how people are actually using the system and working on collecting the accumulated community contribution from the past few years, all while conducting an evaluation of the state of the project to determine whether or not the project should continue implementation. While we have certainly run into many challenges, we are learning from our mistakes and working towards a more sustainable future for the project.



## Looking Forward

Our summer travel has been cancelled due to travel bans imposed by Columbia, EWB-USA, and our own executive board caused by the COVID-19 pandemic. Despite this setback, we are determined to continue communication with our partners in Otubet and Soroti, through regular updates via email, WhatsApp, and Facebook Messenger on the system and the status of COVID-19 in the region and country.

Currently, our teams are working on solutions to repair the systems at a low cost, creating methods to communicate the 5% community contribution, voicing important factors for EWB-USA to consider in their response to COVID-19 with our partner community in mind, and finishing Ugandan government paperwork.

As we move forward, we are taking into consideration the safety of our own team and the safety of the Otubet Parish community.

## Gratitude

Thank you for your continued support of CU-EWB Uganda. To our dedicated seniors, Jasmine, Nimat, and Noah, we want to thank you for the countless hours you've put into our project and we wish you the best of luck in your future endeavours. We would especially like to thank our wonderful mentors, Julio and Brandon, and engaged alumni for providing us with incredible guidance this past semester. We are also excited to work with our new faculty advisor, Professor Harry West who is focused in human-centered design. If you would like to learn more about any aspect of our project, please reach out!

## Authors:

**Jessalyn Chuang & Martha Escobedo**  
*Uganda Program Managers*

# HELP US HELP OTHERS

## **SPONSORSHIP & 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. Thank you for your consideration and generosity.

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## **MAIL CHECKS TO:**

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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.

## **STAY CONNECTED:**

Instagram: @cuewb  
Facebook: [facebook.com/cuewb](https://facebook.com/cuewb)

## **GET INVOLVED!**

We are always looking for student members and professional members alike! Visit our website [www.cuewb.org](http://www.cuewb.org) for our meeting times and locations this semester. We are in need of both technical and non-technical expertise; you don't have to be an engineer to join Engineers Without Borders.



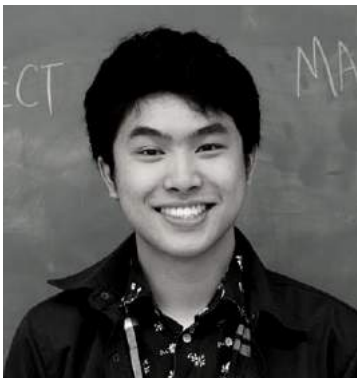
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# THANK YOU!

FOR YOUR SUPPORT

CU-EWB'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 invaluable contributors, mentors, volunteers, and supporters. We would like to thank all of our members, mentors, and supporters that ensure the success of our projects. We would also like to thank everyone who supported and volunteered for our many events.

Finally, we would like to thank the generous sponsors and grants whose financial support makes our ongoing work possible:



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