



Urban Agriculture: Verti-Culture

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working with
The American University of Beirut, Clients Youssef Jawdeh and Hana Sobh

GreenRise Designs was tasked with developing a vertical gardening system to address the scarcity of food and lack of youth agricultural education in Beirut, Lebanon. This engineered system provides an easy and simple way for school-aged children to become more interested in agriculture all while giving their families access to freshly grown produce. This was done in collaboration with the students at the American University of Beirut. Being able to work with a team outside of the United States was a transformative experience as it helped the GreenRise Designs team develop our cultural consciousness, our intercultural communication, and our own personal development.

The project presented many challenges that could only be resolved through intercultural communication and becoming more aware of the customs and standards of each country. Each team had to become familiar with the values, biases, regulations, and lifestyles of one another and learn how to work together to produce a final product. Through the hardships, all parties involved became more aware of the differences in cultures such as holidays, learned about the daily lives of one another, and navigated around language barriers and time differences.

These encounters are unique to an international experience as they allowed the team to expand our ability to interact in an unfamiliar setting and have a better understanding of what the future may hold within the workforce. Though we were unable to physically travel to Lebanon due to unforeseen circumstances, the team was still able to receive the full benefit of the experience through technology such as Zoom meetings and WhatsApp communication. Getting to interact with the students and being able to observe a new way of thinking through each new person we met, the GreenRise Designs team believes our horizons have been expanded beyond the United States and are able to combat any challenges we may face ahead.



Cuenca Wastewater Treatment Project

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The University of Cuenca, Client Dr. Alvarado

For our capstone project, we were tasked with rehabilitating a decentralized wastewater treatment system in Cuenca, Ecuador. As we near the completion of our project and the end of the semester, we in the CASA team have been incredibly grateful for this opportunity.

For the discussions of our solution, data collection, and anything else we required, we were able to communicate with a team of students at the University of Cuenca, Dayanna, and Danny. This alone was the most eye-opening part of our experience, as frequent chatting became a rather amicable bond we had made with people across the world. The student we talked to the most, Dayanna, was the warmest introduction to the Cuenca Team. She made an effort to give us everything we needed, we also had shared experiences with the whole four of us being determined women in our field.

Aside from new friendships, we also observed how different their culture was. Of course, there were the small things, like Dayanna and Danny having a week off of school just for Carnival, or Dayanna having to translate for us since Danny was from Venezuela and didn't speak English. However, some differences made us appreciate where we were, what we had, and who we could rely on.

We were only tasked with doing background research on their water quality, and even just examining the tip of that iceberg, we discovered the hardships people struggled with in the San Pedro community. Most of the wastewater infrastructure in poorer communities was man-made and technically illegal, even though government projects to construct needed facilities were



strained to reach them. Some of their water was plagued with flecks of aluminum and gold from mining operations, even our task of managing the high E. Coli concentrations in the runoff of just one septic tank. These differences made us look back at our communities, reflecting to see if we were blithely unaware of similar problems at our doorstep in the U.S.

Around the beginning of January, we were met with news that certain drug lords in Ecuador had escaped prison and declared war on the current president, going so far as to take over an Ecuadorian TV station while they were still on air. Months ago, news like this would have been received like a mirage, distant and almost unreal. But now we had people we knew that were directly affected by this, thankfully Dayanna and the rest of the team were completely safe, albeit stressed from added curfews which affected data collection for the project. The fact the team could pivot so easily from that and focus on what needed to be done was once again another cultural shock.

The events of the past few months have transformed our understanding of international projects and teams. Outside of the run-of-the-mill conversions of measurements and making sure to adjust to different discharge protocols, this project helped us gain a newfound appreciation and respect for our field. We'd felt the weight of our solutions, not just numbers and Excel sheets, but protecting surrounding ecosystems and improving communities. The communication hurdles we had to overcome made us more vigilant in contacting our client and the Cuenca Team, and meetings with them were always interesting as there was some new part of Ecuadorian Culture we got to observe. Due to the complications over winter break, we weren't able to visit Dayanna and Danny in person, but just getting to work and chatting with them has made this project worthwhile and life-changing. We don't think we could've gotten the same experience if we weren't an international team, needless to say, we're grateful.



Sarita Well Water Filtration Project

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Reach Beyond Borders, Comunidad Sarita, Guatemala, Client Dave Cook

For our capstone, the team had the privilege of traveling to Guatemala. While there, we got to see our water system design implemented and functioning. This hands-on experience not only deepened our understanding but taught us how to improve our design during installment.

One essential lesson that the team learned while on the trip was how to adapt on the fly. As an Engineer, you often design and solve scenarios in ideal situations but in reality, you have to make decisions about unknown constraints and decisions that affect other people. Given our limited amount of time onsite and the immediate need for cleaner water, our client asked us to implement a system then and there instead of modeling a design first. The team learned what it means to adapt on the fly, modify your ideas, and think outside the box to provide a solution that is best for your client.

Beyond the technical aspects, this trip allowed the team to view and open our eyes to new cultures. The capstone group understood that the culture in Guatemala was going to be different compared to the culture in America yet when we found ourselves completely submerged in a different lifestyle, it provided a deeper understanding. The trip allowed us to see the needs of people in different countries and inspired us to learn more about and experience different nationalities. Our conversations with the students and staff of the school made this project have more of an impact on the group too. We could discuss with the locals how this water was harming the community and could see the importance of this project to them. This, in turn, pushed us to work tirelessly to provide a design that would be the most beneficial for them.

For each member, this experience was monumental. It allowed us to use the Engineering skills we acquired at Texas A&M to make a difference in the lives of others. It was fulfilling to apply these skills to help people who need it the most.