



NAE Grand Challenges Scholars Program

Sustainability through Access to Clean Water



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Global Perspective

I grew up learning about the issue of clean water availability through my mother's Peace Corp work in Nepal. She served in the Solukhumbu region of the country for over two years, designing and building a system that brought water down from a protected source, high in the hills, to the villages. Through her, I came to understand that not everyone in the world was as fortunate as myself – many lacking access to the everyday resources I could too easily take for granted. However, understanding that a global issue exists and delving in to see it and its impacts first-hand are two vastly different experiences. It was not until I arrived in Bangalore, India for a three month internship in 2017 that I began to understand the implications of what my mother had taught me.

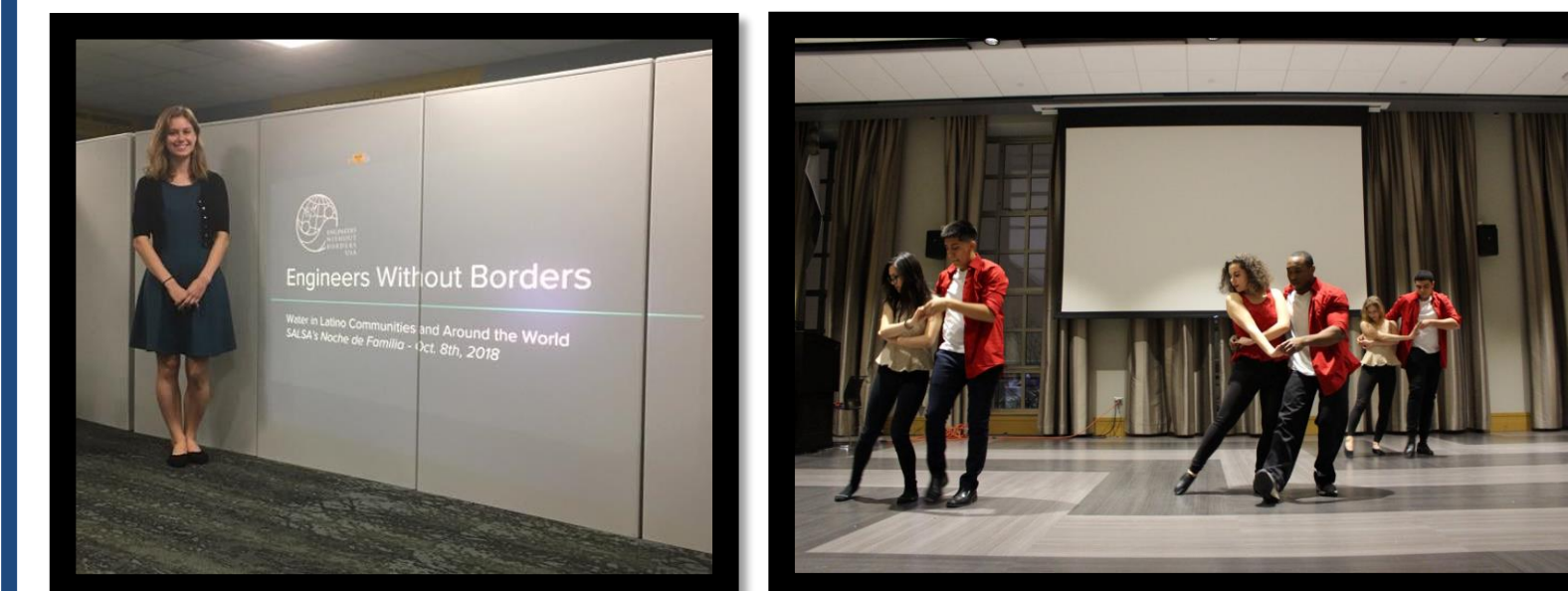
Although my internship did not focus on clean water, it was an inevitable and valuable piece of my abroad experience. I had to avoid drinking tap water, adjusted to using Eastern-style toilets devoid of toilet paper, and became used to starting every morning with a (cold) bucket shower. My summer in India introduced me to the cultural differences and disparities surrounding hygiene, and spurred on my interest in studying this grand challenge more in depth.



Interdisciplinary

What I continue to realize as I dedicate more and more time towards this grand challenge is how multi-faceted it is. While access to water can be tackled as a purely engineering problem, it can never be resolved without addressing the human side. Education must parallel the implementation of new technologies and sanitation practices to ensure end-users are responsible for their own situation and health. In order to accomplish this in Don Juan, my Engineers Without Borders (EWB) team and I put together education workshops on hygiene, sanitation, and our chlorination system to hold during our trip for everyone from the school's principal to its youngest student.

As we are working in a community different from our own, it was important we take the time to learn about and appreciate the environment of the Dominican Republic. To this end, I took several online Spanish courses and have enjoyed being a member of SALSEROS (a Latin dance group). These endeavors have helped me understand and interact with the people of Don Juan. No matter where solutions for grand challenges are being implemented, it is important the community is continually considered to ensure sustainability.



Research

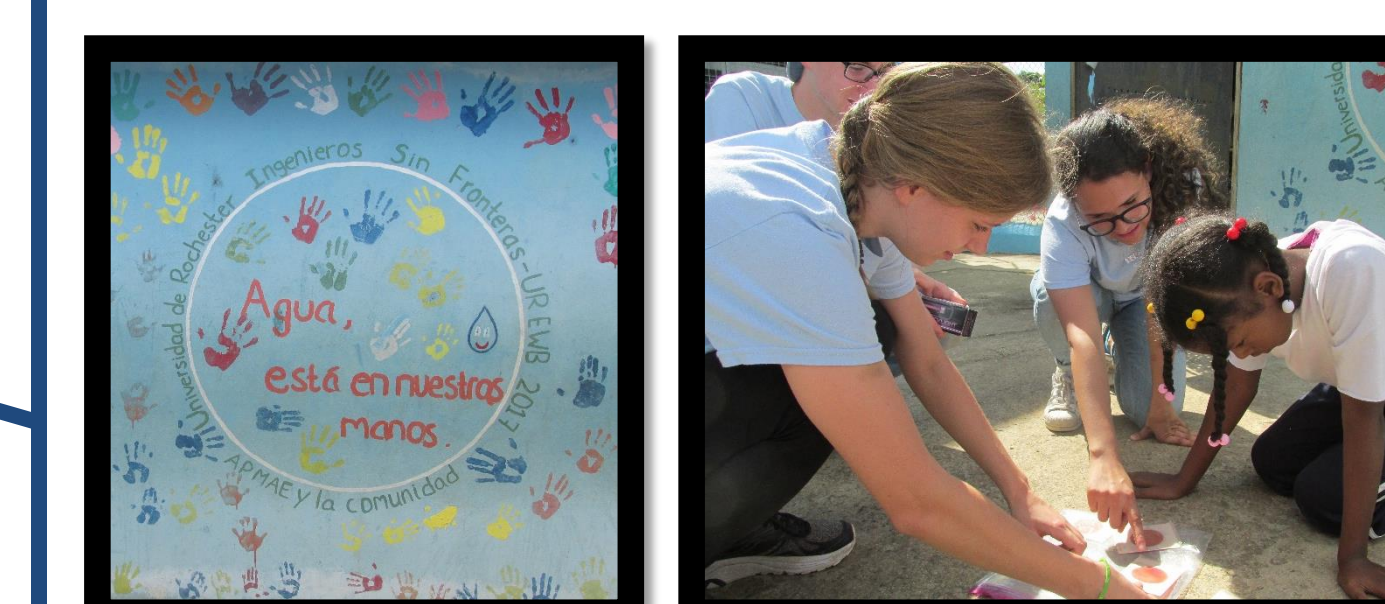
Though for many years I had been aware that global access to clean water is a persisting issue, it was not until I began to investigate the current statistics, recent work, and future research on the subject that I fully understood the wide reaching impact of this grand challenge.

As a member of the University of Rochester's chapter of Engineers Without Borders (EWB), I have worked with my peers, our advisor, and members of our partner community to better understand the issue of access to clean water and determine the best way to combat it for a particular community. Based on field test analysis we conducted, myself and other members of our program committee researched water filtration methods looking for solutions appropriate for a rural community in the Dominican Republic. We then wrote the necessary proposals to EWB Nationals justifying our decisions for implementation, monitoring and evaluation trips.



Service-Learning

I have been fortunate enough to have the opportunity to volunteer through EWB and serve in Don Juan, Dominican Republic. I traveled to our project site in January 2018 for a week and for another week in 2019 to work on our water filtration and distribution system installed at a local elementary school, Escuela Taller Santa Maria Josefa Rossello. My experience there has afforded me with great insight and appreciation for our work and the global issue of access to clean water. On the most recent trip, we took the time to sample not only our own water source, but many water sources in the Don Juan community. The results of the bacterial tests indicated that, of the samples tested, the water treated by our chlorination system was the cleanest, showing no signs of E. coli or any other coliform.

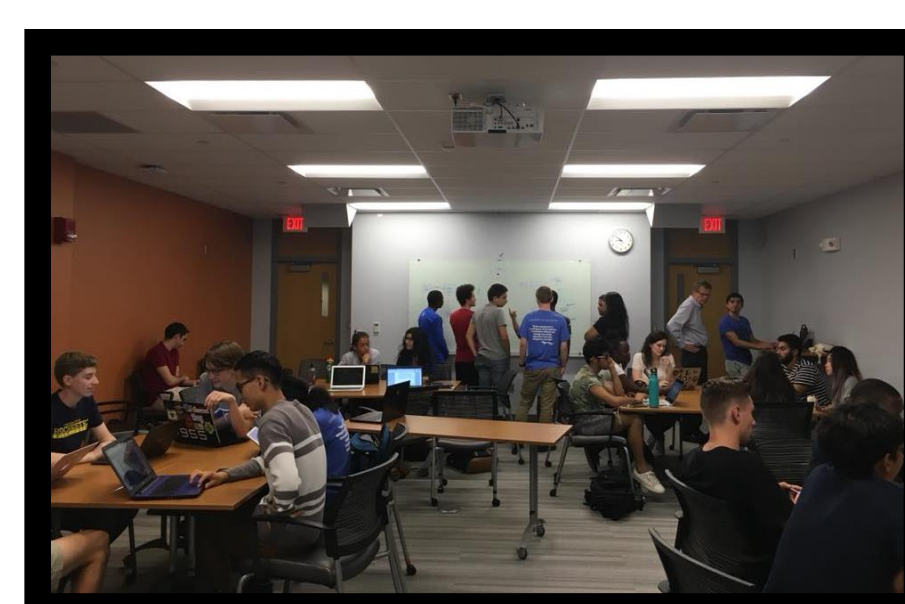


It was rewarding to see such positive results over our five-year partnership with the community.

Entrepreneurship Experience

To do work towards overcoming any grand challenge, more often than not it is necessary to acquire funding. To this end, I have worked with my EWB team to apply for grants, participate in on- and off-campus fundraisers, and raise awareness for our project. We have worked with iZone on campus to hold workshops to brainstorm ideas and enact those plans effectively.

Additionally, I have been able to connect with several groups near to Rochester who are currently working on providing access to clean water. I have been able to meet and speak with members of both the Ugandan Water Project and Water for South Sudan. Both of these grass roots organizations have been doing incredible work and have been able to give me and my EWB group suggestions on how to move forward. They have also helped me personally in understanding the scope of work that remains to be done and encouraged me to think about how I can assist these efforts moving forward. Recently my EWB team has also connected to the AAVia Foundation, a group that works in Bolivia, as we look for our next project site. Networking to share experiences, ideas, and work towards a common goal is an important aspect of successfully overcoming a global challenge.



The Grand Challenge Scholars Program & Thanks

The fourteen grand challenges, defined by the National Academy of Engineering (NAE), each contribute to the vision of "continuation of life on the planet, making our world more sustainable, secure, healthy, and joyful." The NAE's scholars program has provided me with the incredible opportunity to capstone my undergraduate experience with the theme of Sustainability through Access to Clean Water. I have been fortunate enough to connect with many incredible people through this program, across multiple disciplines and countries. I would like to thank the NAE's Grand Challenge Scholars Program, the Hajim School of Engineering, my dedicated chapter of Engineers Without Borders, and the many others who have helped me along this journey.

I am also looking forward to continuing to work with others to overcome this grand challenge as I move on to a graduate program focused on global development through engineering and education. I have applied to the NSF Graduate Research Fellowship Program to fund research into creating an improved borehole pump which can be more easily maintained in rural areas. Many communities there have pumps installed but are unable to use them due to broken pieces and the expense of repairs. Hopefully an improved design will help to relieve some of the water stress in these areas. I'm excited to move on to this next phase.