

# **SUSTAINABLE WATER TREATMENT SYSTEMS IN THE LA VEGA REGION OF THE DOMINICAN REPUBLIC**

Hannah Fulton, *Speech, Language and Hearing Sciences* | Justina Thomae, *Nursing* | Jorge Del' Angel, *Agricultural and Biological Engineering* | Ramin Ansari, *Civil Engineering* | Karina Peate, *Nursing* | Rylan Elliott, *Environmental and Ecological Engineering* | Adam Spieth, *Environmental and Ecological Engineering* | Thalia May, *Environmental and Ecological Engineering* | Morgan Jung, *Engineering Management* | Ernest Blatchley, PhD., *Civil Engineering* | Rebecca Johnson, *Nursing*

## **BACKGROUND**

In 2012, Purdue University established a multidisciplinary service learning course to provide the La Vega region of the Dominican Republic (DR) with access to safe drinking water. Students, under guidance from faculty, began communications within the La Vega Region, specifically the Las Canas community, to determine the need for water sourcing and treatment within their communities.

The pioneer system in Las Canas was installed in 2014, and subsequently led to the installation of three other systems: Los Peladeros in 2017, El Mamey in 2018, and La Torre in 2019.

While Las Canas began with a system that ran off of ground water, all of the systems mentioned above are currently sourcing water using tinacos and rainwater collection gutters. After sourcing water, a Zimba water clarification system, along with cartridge filters and UV bulbs make the water potable (Alwang, et al., 2017).

None of the previously implemented systems are currently operational. This development will be explored further in the methodology section.



Del'Angel, J (2023). Desecho Education Center



May, T. (2023). Thalia May, Rylan Elliott, and Adam Spieth (EEE Students) pose outside of Desecho Education Center

## **OBJECTIVES**

- **Aim to learn from past experiences**
- **Improve the four current water systems installed**
- **Keep water systems running by doing causal analysis**
- **Reproduce project successes in new locations**

## **REFERENCES**

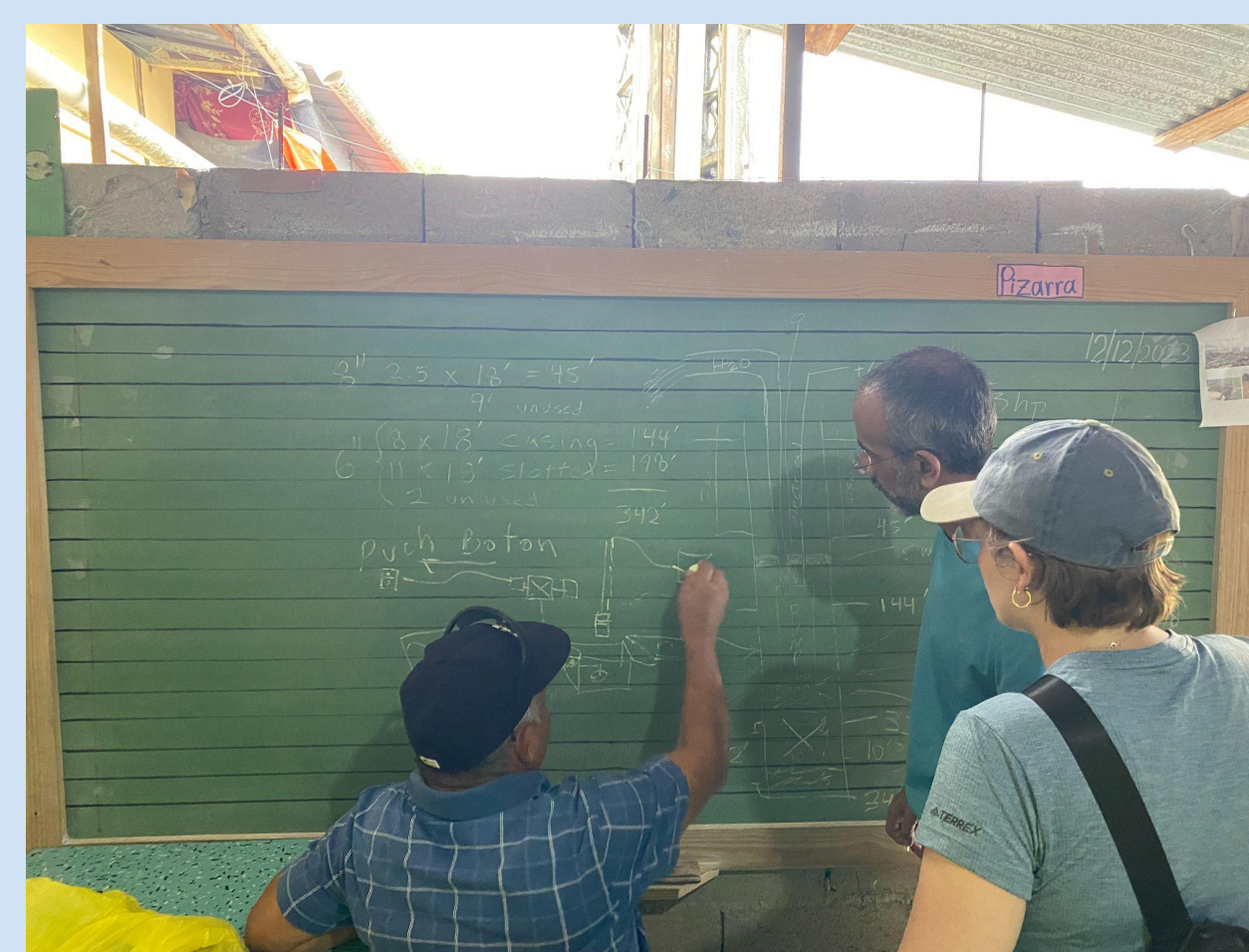
Alwang, Albert; Busse, Margaret; Caprio, Audrey; Fenton, Marieke; Hawes, Jason; Kanach, Andrew; and McElfresh-Sutton, Autumn (2017) "Water Supply in Developing Countries: Student Experiences in the Dominican Republic," *Purdue Journal of Service-Learning and International Engagement*: Vol. 4 : Iss. 1 , Article 7.

## **METHODOLOGY**

During the 2022-2023 class, a methodical root cause analysis was performed investigating the systems that fell into disrepair and were not functional. In Spring of 2023 class members visited two of these communities to confirm findings and assess repair needs. The 2023-2024 classes intended to apply these learnings to repair two existing systems and for a planned 5th system to be installed in El Desecho.



May, T. (2023) Rainwater collection system at Desecho Education Center



Del'Angel, J. (2023). Well design schematics at Desecho



Del'Angel, J. (2023). Well Drilling Process

## **REFLECTION & CONCLUSION**

At the end of the 2024 spring semester, the team is planning to go back to El Desecho and install the 5th treatment unit. The water for this unit will be sourced from the well that was installed in December of 2023.

Intercultural communication has been a learning point for many members of the class. It is important to understand that the class is based off service-learning while immersed in a different culture. As a result, there is a need to assimilate and respect local customs and traditions.

Future classes can learn from past failures to repair the existing systems and improve any future systems that may be installed.

## **IMPACTS**

In Fall 2023, students travelled to El Desecho to install a well water system. The school had concerns about water supply and quality due to the limitations of the rainwater collection and storage systems. In turn, we worked with a local school and a local drilling company to discuss placement of the well. The successful installation is now producing water abundantly. Students also visited two other communities to plan future repairs to be undertaken in Spring 2024.



May, T. (2023). The sky over Desecho after a day of work



## **ACKNOWLEDGEMENTS**

Rotary Club International  
Purdue University  
Environmental & Ecological Engineering

