

Abstract

This project focuses on developing a sustainable and economical water filter for use in developing countries, particularly Haiti. After investigating various methods of purification, it was determined that a combination of ultraviolet treatment and carbon filtration was the most promising approach. A prototype of the design was developed; looking forward partnerships with non profit organizations are the best method of implementation.

Background

- Current purification methods aren't sustainable or economical
- Water borne bacteria are the main cause of illness and death in Haitian children
- Water used in cultural rituals must taste a certain way; most filtration methods change the taste



Awareness

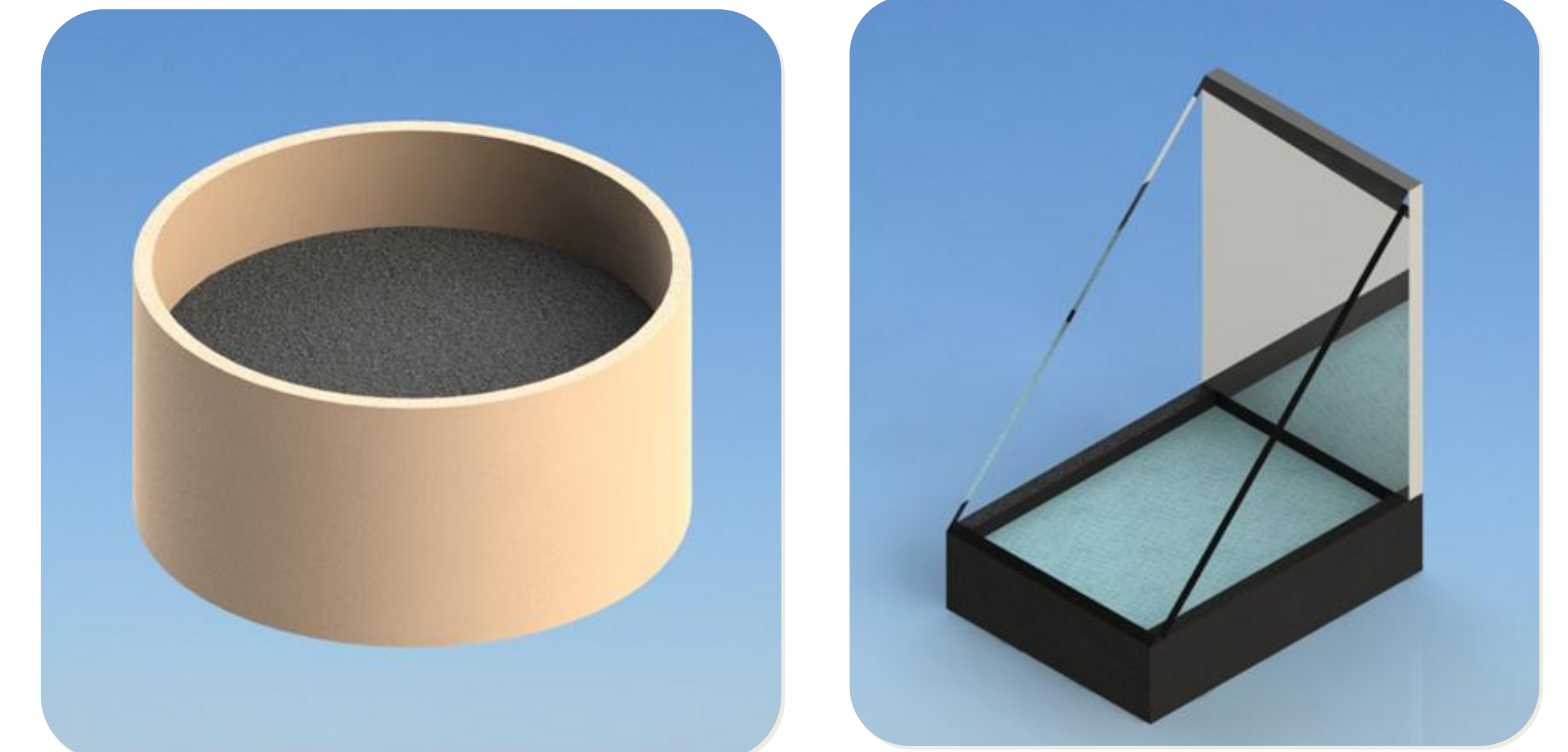
- Many do not understand the link between illness, water, and bacteria

Project Goals/Objectives

- Gain a comprehensive understanding of challenges facing Haiti with respect to contaminated water
- Investigate treatment methods to design an effective water treatment sustainable and economical system
- Define productive and contrary components of various water treatment methods
- Implement the design in a community with a plan to educate the community about the design and cultural implications

Pathogens in Haiti

Microorganisms	Associated Diseases	Major Reservoirs
Salmonella typhi	Typhoid fever	Human feces
Salmonella paratyphi	Paratyphoid fever	Human feces
Other Salmonella	Salmonellosis	Human/animal feces
Vibrio cholera	Cholera	Human feces/freshwater zooplankton
Enteropathogenic E. coli	Gastroenteritis	Human feces
Rotaviruses	Gastroenteritis	Human feces
Adenoviruses	Upper respiratory/gastrointestinal illness	Human feces
Norovirus	Gastroenteritis	Fomites and water
Hepatitis A virus	Infectious hepatitis	Human feces



Carbon Filter and Solar Disinfection System
SolidWorks drawings

Methodology

- Conducted interviews about Haitian water and culture
- Researched Haitian water and culture as a supplementary source
- Researched various water filtration methods; assessed sustainability and costs
- Designed prototypes for a charcoal filter and a UV solar disinfectant

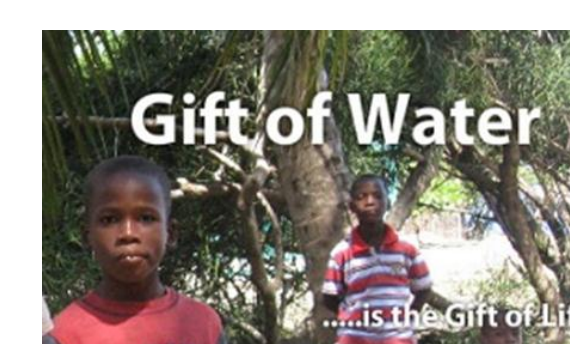
Conclusions/Recommendations

- Haitian communities would benefit from a more sustainable filtration system
- Charcoal filtration and UV solar disinfectant are cost effective filtration designs
- Combining charcoal filtration and UV solar disinfectant into a single design will better Haitian water quality

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Implementation Plans



References

- http://whyfiles.org/wpcontent/uploads/2010/11/1haiti_artibonite_river.jpg
- https://si0.twimg.com/profile_images/1199927734/HomeDepot.jpg
- <http://inlandpolitics.com/blog/wp-content/uploads/2010/11/lowes-logo.jpg>
- <http://midwesthaitipartners.com/Partners/Image/13>
- http://www.onedayswages.org/sites/default/files/charity_water_logo.jpg
- <http://www.charitywater.org/whywater>