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Water and Sanitation in Honduras

Walking off the ship, I'm met with cool salty air at the door, then an over abundance of sunlight hit me like a wave, I was blinded. As I regain my sight I start to make out the beautiful paradise unfolding before me. Growing closer to the main gate, I was over whelmed with so many exotic smells and sights; it took my breath away. Packed in like sardines, sweat dripping down my back, we sped away in the taxi. The two-lane highway curved and bent with the terrain of the land; to my left I could see the most beautiful plantation homes with ornate molding-patterns and white picket fences. Then looking to my right, to have the air stick in my chest, I just didn't know what to think..

In March of 2014, I had the opportunity to visit Roatán, an island off the coast of Honduras. During my vacation, our ship docked in Roatán, giving my family and I the opportunity to tour the island and scope out a great beach to spend the day. Little did I know, this day would make such a significant impact on my life.

As our driver talked about the island life and all the beautiful sights to see, I found it rather hard to be an active listener as I watch scenes that I had only seen in movies unfold before my very eyes. Poverty.

A young boy stopped to watch us roll by, I met his eyes in passing. Thinking to myself, I wondered how such a young, frail looking boy could be digging a ditch on the side of the road. Then in an instant I am thrown into my siblings in the back seat as our driver swerves, to not only avoid a massive pothole, but also the young boy filling it. As my heart began to beat at a more regular rate, I realized the severity of what I was looking at. To my left, was the wealthy and well off on their grand estates with beachfront views, but to my right were those who were stricken with poverty. Many were living in makeshift homes with several young children, running around half clothed. Then and there I found the desire to make a difference.

Honduras. Honduras is located in Central America, which is part of the North American Continent. Just to the east lies the Caribbean Sea; the lowlands and mountain slopes are densely forested with a hot and humid climate. Along the northern coast of Honduras the alluvial plains and coastal sierras can be found. In comparison, the central highlands are known for their fertile soils due to years of lava and volcanic ash build up. Likewise the Pacific lowlands, which are centered on the Gulf of Fonseca, are also composed of alluvium and or volcanic build up, therefore producing very fertile soil (J. Roberto Moncada R. 1).

Right at 97 % of Hondurans are Roman Catholic; which creates a very tight knit family unit. Family loyalty is the center of daily life; their social identities, business success and status in government is all determined by who they are related to and or who they know. Many trusted friends are brought into the family and become “compadres” or godparents, they take on the responsibility of a child's status in the church (Clegern 4). When it comes to education a little over 85% of the population over the age of fifteen can read and write. Although there is large amount of male and females who are literate, there are currently more educated men at this time (World Fact Book). Despite the fact that Honduras has a highly educated population, 59% of them are living in poverty. “Honduras, the second poorest country in Central America, suffers from extraordinarily unequal distribution of income, as well as high underemployment (The World Fact Book).” Unfortunately this causes roughly 80% of Hondurans to not have access to quality health care. The increase in diabetes and hypertension, as well as a rise in cancer all relate to the lack of access to care for chronic and common infectious diseases (AmeriCares.org). Many chronic diseases that face most Hondurans are caused and or progressively get worse due to malnutrition. Much

of the poor population live off of common dietary staples such as corn, beans, cassava, plantains and rice. Neither meat nor green vegetables are common in a Honduran diet.

Many Hondurans are subsistence farmers, growing only what they need for their own families. Dependent on what the land will provide, much of the country accommodates for specific plants and animals; which is determined based on geographic regions. The eastern Caribbean lowlands and mountain slopes are known for lumbering, which is an important economic activity in this region. Subsistence agriculture and fishing are the main support of the scattered population. As for the northern coastal, alluvial plains and coastal sierras, they produce lots of rich crops such as bananas, rice, cassava, oil palm, corn (maize), citrus fruits, and beans. In this region of Honduras they also have the ability to raise cattle, poultry, and pigs. Like the northern coastal and alluvial plains, the central highlands produce a wide variety of crops such as coffee, tobacco, wheat, corn, sorghum, beans, fruits, and vegetables. They also have the resources to support cattle, poultry, and pigs. Last but not least, the Pacific lowlands produce sesame seed, cotton, corn and sorghum; coffee is also grown on the nearby uplands. This region also raises cattle on the lowland pastures in the area (J. Roberto Moncada R. 1). Larger farms are owned by foreign corporations and are mainly used to export bananas and coffee (Woodward, Jr. 2). Something common throughout Honduras is their farming practices, specifically are the slashing and burning techniques they use to clear their fields at the end of harvest. Many Hondurans struggle with improper farming practices this in turn damages the land, there for creating another burden for the farmers. On top of that, there is little knowledge of irrigation techniques, seed selection, or pest control among the native farmers.

Due to lack of access to agricultural information, modern techniques haven't reached the poorest subsistence farmers, mostly because of the disconnectedness between rural families. With many men out in the field a majority of the day, and the wives at home taking on the family responsibilities, this leads to a lack of communication throughout the family unit. The lack of communication also causes barriers in the way families access food markets and find adequate nutrition. If families were able to collaborate and sell their goods in cooperative markets, they would have the ability to have influence over the prices they receive, therefore increasing their income and breaking the cycle of poverty. Although families are hurting themselves with a lack of communication, they are also up against the large farms owned by foreign corporations who have control over the prices of the exported bananas and coffee. This adversely effects the market price offered to the local farmers. Unfortunately in Honduras there are many divides and or barriers that hinder water access to all people. Specifically issues that involve economic status (wealthy/poor), education and smallholder verses large-scale farms are the most prominent of issues. Those without literary skills often lack the knowledge and know how to seek out the information that would enable them to make good decisions about water. Although education and economic lines are typically similar an individual's economic status plays a huge role in accessing water. Those with the financial means are able to utilize advanced wells and filtering techniques, while those with less are limited to rain barrels and cistern systems. These less costly solutions lend themselves more easily to disease. The separation between the haves and have not's is significantly increased when comparing the largest of the corporate farms to local sustenance. Another barrier that Honduran families face is their overall environment that hinders their access to food markets.

One could consider water and sanitation conditions in Honduras to be one of the biggest environmental barriers. "Over 2.2 million people lacked access to improved sanitation services, and 1 million lacked access to improved drinking water services in 2010, of these, 66 percent and 80 percent, respectively, live in rural areas"(UNICEF 2011). Not only is it a barrier for the common man, it also greatly effects farmers and their ability to produce. Due to lack of irrigation and overall rainfall in Honduras, their agricultural productivity has come to a stand still. Many of the native farmers and their families have to travel to great lengths to find water that they can haul back to water their crops with. The Gutierrez family experienced this quite often: " Each day during the growing season, she, her husband and their eight children would make several trips to a river about 40 minutes away and carry back five buckets of water to replenish their

plants (Washburn and Usher 1).” With the lack of rainfall and overall access to water in general, many Honduran farmers are unable to produce enough to support their own families, non the less have a chance to sell them at the market. This also is affected by the major climate changes and the severe drought Honduras has experienced in recent years.

On top of an overall lack of access to water and sanitation, a recent drought and major climate changes have hit farmers hard. This has effected not only the quality of food they grow but also the quantity. In Honduras, a major issue is the effect of climate change on the rural communities as well. “According to a Germanwatch report, Honduras topped the list of countries most affected by climate change in 1992-2011. During those 19 years, Honduras saw 60 extreme weather events and averaged 329 climate change-related deaths per year (Moncrief).” The climate change has had a negative effect on many rural farmers and their communities, resulting in depleted agriculture production that will take many years to recover.

There have been many relief efforts in recent years, but this is not enough to correct all the problems Hondurans face on a daily basis. “In 2006, the Honduran government reported 34% of the district's people lacked access to safe drinking water and 43% lacked proper sanitation (Kosowatz).” Developing countries like Honduras face a major disadvantage due to the fact that many of the poor rural farmers lack the financial ability to pump water to their fields, as well as access to agricultural information and modern farming techniques. Likewise there is also major absences of clean drinking water and sanitation, “Only 79% of individuals living in rural Honduras use improved water sources. Inadequate drinking water quality is related to diarrheal illness, which in Honduras contributes to 18.6 episodes of diarrhea per child per year in children under five years of age (Rural Remote Health).”

Overall water and sanitation in Honduras has improved immensely due to the help of many religious based organizations as well as many sponsored initiatives by the government. Many of these organizations keep records of their progress and share this with as many people as they can reach in hopes they will help. For instance the ASME (American Society of Mechanical Engineers) reported that: “WMI's solution, called the ‘Healthy Latrine,’ still is basically a pit-type latrine but uses a standard flush toilet, without the tank, making it cleaner and healthier than a standard pit design. The project has been an overwhelming success based on studies done in 2010 some 10,000 new latrines had been built. The work showed an 80% improvement in the number of people tested for parasites and a 50% decline in the number of diarrhea disease cases reported to local health clinics (Kosowatz).” Although the “Healthy Latrine” maybe the only market ready option at the moment, there is a new wave of toilets that will not only change the way we view sanitation but fossil fuels as well. There is this concept of a self-containing, decomposing latrine system that could turn raw materials such as human feces into fuel, specifically biomethane if in the right environment. Based on my research biomethane is described as: “a naturally occurring gas which is produced by the so-called anaerobic digestion of organic matter such as dead animal and plant material, manure, sewage, organic waste, etc. (biomethane.org.uk).” Anaerobic digestion is a group of processes by which microorganisms decompose biodegradable material in the absence of oxygen thus creating biomethane (Wikipedia). “Since biomethane is chemically identical to natural gas, it can be used for the same applications as natural gas. It can be used for electricity generation, water heating, space heating, cooking as well as to fuel vehicles (biomethane.org.uk).” With such an idea in mind harnessing and using biomethane to not only be able to pump water to irrigate the farms in Honduras, as well as giving them a few hours of electricity at night in their homes could be life changing for many. With improvements like these Honduras is well on its way, but there is still a lot of work to be done. Not to discount the fact that many rural farmers and their families’ lives have improved due to such efforts, the desire to move forward will only continue to improve the living conditions of many Hondurans. Improving the water and sanitation in Honduras, specifically for those in the rural section of the country would not only improve their overall living conditions in addition to increasing the quantity and quality of the food grown. If water became more accessible to rural farmers their crops would not only be more nutritious but there would be a larger quantity of them, which in turn could mean an income

for rural farmers. This would then reduce poverty levels in rural Honduran families and then from there the money would trickle into the economy, creating an overall increase in living standards for Hondurans. In addition, improving sanitation would not only benefit the rural communities but would also help to sustain a healthy environment, due to the fact that a composting latrine would reduce the chance of water contamination.

In order to combat the growing epidemic of water and sanitation, the rural Honduran communities need to implement solar powered irrigation systems in order to improve their overall food security. As well, the Honduran government needs to invest a substantial amount of capital in building levees along the eastern coast, in order to prevent future natural disasters from not only wiping out communities but also from polluting the country's safe drinking water. Although the government is moving towards solutions, there are many deficits that need to be overcome. "Honduras signed a three-year IMF stand-by arrangement in December 2014 that will help ease its poor fiscal position. In November 2014 along with his counterparts from El Salvador and Guatemala, President Hernandez announced the 'Plan of the Alliance for Prosperity in the Northern Triangle.' This plan seeks to address the challenges facing the three Northern Triangle countries, including steps the governments will take to stimulate economic growth, increase transparency and fiscal responsibility, reduce violence, modernize the justice system, improve infrastructure, and promote educational opportunities over the next several years (The World Fact Book)." In addition, organizations and corporations like ASME (American Society of Mechanical Engineers) need to continue their work, by implementing the "Living Water Treatment System, a safe drinking water package that uses filtration and chemical disinfection to produce clean drinking water. It operates on solar energy, and produces 1,000 gallons of water for less than 75 cents, says Green IV' (Kosowatz)." Finally rural farm families need to get involved, raise their voices to encourage the implementation of these recommendations, and help to ensure that these practices will be sustained for years to come.

In conclusion, based on Honduras's overall lack of water and sanitation there is a need for new systems, technologies and financial resources to combat this epidemic. Correcting these problems would not only benefit the health of many rural communities but would also help them in multiple ways, including: improving the quality and quantity of food, reducing poverty and bettering the economy. Based on my experiences in Roatán, there was a need for change and this is my stance on how to improve the lives of Hondurans for generations to come.

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