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Haiti, Climate Volatility

Haiti's Crisis

"Food security means all people have access to culturally appropriate, nutritious food at all times without relying on emergency supplies," (Pattie Baker.) One country in particular that relies heavily on emergency supplies is the country of Haiti. In more recent years Haiti has been struck heavily with volatile weather destroying their food supplies. Relying heavily on emergency supplies, the country is in dire need of help. Through the use of agroforestry and the planting of high-tolerance plants, Haiti could be able to get back on their feet and supply for themselves.

Haiti is a country located in North America or more specifically the West Indies on the west side of the island Hispaniola. The country spans 10,714 mi^2 and contains a population of 11.26 million people (World Bank). Haiti is made of two primary mountain chains from the Dominican and spread westward and three smaller mountain chains: Massif du Nord, Montagnes Noires, Chaîne de Manteaux, Massif de la Hotte, and Massif de la Selle. These mountains are made up of mostly limestone through the Massif du Nord and are made up of some volcanic formations. There are many southern peninsulas surrounded by an ocean gulf labeled the Golfe de la Gonave. Haiti has a generally hot and humid tropical climate. The north wind brings fog and drizzle, which interrupt Haiti's dry season from November to January. However, from February through May, the weather is very wet. Northeast trade winds bring rains during the wet season. Around 79% of Haitian homes are family homes (Index Mundi) with an average family size of 3.7 people (Concern USA). The typical income for a family like this is about 828,885 HTG which equates to 11,013 USD (World Bank) with almost 2.5 million people living in poverty or living with less than $1.25 a day (USAID). The average farm size in the country is equal to 2.5 acres (Freedom Report). Most of the agriculture in Haiti is subsistence farming and includes cassava, plantains, bananas, corn, yams, sweet potatoes, and rice. Many crops are sold at rural markets and along roads. Haiti's main cash crop is mild arabica coffee. Because Haiti is a free market economy with low labor costs and tariff-free access to the US on many of its crops, agriculture is the biggest way that the country of Haiti makes its money. The country is estimated to be 50% Catholic, 29% Protestant, and 4.6% Voodoo ("Haiti 2018 International").

Though Haiti seems like they get by on what they have with their agriculture that idea is very much not true. Within the recent year, the country has not suffered drastically from the pandemic with only about 234 confirmed deaths (Emergency Management) however, over the last two decades, there has been a series of natural disasters and civil unrest that destroyed the country. These include, but are not limited to, Category four Hurricane Matthew, and a devastating earthquake in 2010. This has caused the country to become fourth in rank among the

countries most affected by extreme weather (World Food Programme) and caused poor performance from

the agricultural sector which has caused major food insecurity. 49% of the people and 22% of children in the country are undernourished and 10% are underweight (Concern Worldwide US). Haiti has one of the highest levels of food insecurity in the world. In 2018 over half of the population was undernourished and the countries Global Hunger Index Scale rose from 28 in 2009 to 35 in 2018 (World Food Programme). With a score of 33.5 in 2020 (Global Hunger Index that puts it in the top 5 of the hungriest countries in the world. The natural disasters have caused over 1 million people to be considered in a state of emergency and 1 in 3 people (nearly 3.7 million) to rely on urgent food assistance (World Food Programme). Because of this many people have a heavy dependence on food imports. These amount to almost half of the food and 83% of the rice within this country (Schwartz Research group. In turn, the major need for food has caused a major increase in food prices. Products have become 35-77 cents more expensive in Latin American making them unaffordable (Schwartz Research Group). To put this inflation into perspective the average price for two pounds of apples in America is $2.64. In Haiti, that same two-pound bag of apples would go for $3.95, almost a 50% increase ("Cost of Living"). So what options do we have to help Haiti be able to grow its own food and begin to live comfortably again?

As stated before many of the crops in the agriculture sector are destroyed due to extreme weather conditions. Agroforestry is a simple act to implement in the agriculture sector to help strengthen the crops during extreme weather season. Agroforestry is the intentional integration of trees and shrubs into crop and animal farming systems to create environmental, economic, and social benefits. It has been practiced in the United States and around the world for centuries. According to the U.S. Department of Agriculture, there are three types of agroforestry: alley cropping, forest farming, and silvopasture. Silvopasture combines trees with livestock to provide timber, fruits, or nuts, as well as shade and protection. This helps reduce stress on the animals as they serve as protection from the sun or other weatherly elements. Next is forest farming. These are trees that help regulate the amount of shade each plant gets allowing the farmer to vary the type of plants he or she grows. Finally is alley cropping. This is the most ideal type of agroforestry for the country of Haiti as the trees help strengthen the soil and help provide protection for the crops. This is done by planting trees between rows of crops. When properly applied, agroforestry can improve livelihoods through enhanced health and nutrition, increased economic growth, and strengthened environmental resilience and ecosystem sustainability. In turn, such improvements can contribute to increased social sustainability in which human needs are satisfied in a way that fosters environmental health. Agroforestry seeks to optimize positive interactions, such as mutualism and commensalism, and to minimize predation on crops and livestock and competition within and between species. This form of agroforestry would also help to strengthen the roots of the crops during extreme weather events. Though these trees do take up space that could be utilized for more crops, limiting the number of crops produced there is a quick fix to this issue. Instead of using "regular" trees, farmers could grow fruit trees in order to increase their crop production. Plantains are commonly grown in Haiti meaning the fruit is able to grow in the tropical climate of the Caribbean Island. This would allow farmers to grow extra crops while improving the outcome of the others that would otherwise be destroyed by the

weather. Fruit trees are easy to care for once they get started and once they are started they live for many years without deterioration. After only about 5-8 months the fruit will start to grow and as long as there is no cold snap which is very uncommon they will grow that growing season. This makes this an ideal solution to the agricultural issues at least until the money can be raised to help the country further.

This issue is getting the haitians to change their farming ways to include trees. Many farmers may not want to change their ways since that is how they've been doing it since they began farming. Others may see an issue with space since the trees do take up valuable room with crops. Others just may not understand that the trees are there to help them. If the government was not in so much civil unrest at the moment I would suggest that we push the government to pass a law that requires farmers to farm using agroforestry in order to protect their crops and raise the successful crop levels within the country. The government however in any situation is not useful right now. We need to gather volunteers that can help to teach farmers the benefits of agroforestry and how they should use it. We would need to provide them with the seed for the trees since they are not native to the land but this is a long term investment. Once the trees are started in their growing process they last for many decades.

Providing the country with tools that help to predict the volatile weather is also beneficial.

The first tool is the doppler radar. This helps meteorologists predict severe storms which within the country would be beneficial when it comes to hurricanes. There are 150 radar towers within the United States with partial coverage of Alaska, Hawaii, Puerto Rico, and Guam. Adding partial coverage of Haiti to the system can allow educated meteorologists to monitor Haiti's weather patterns and be ready to provide aid to the country when volatile weather events occur. These radars detect all types of precipitation, the rotation of thunderstorm clouds, and wind strength and direction. Next is satellite data. These monitor earth from space and take pictures of the weather patterns at different frequencies throughout the day. This is how we see hurricanes usually and it is currently being used to identify hurricanes not just over the country of Haiti but in fact the entire world. Then we have the automated surface observing system. Again this system includes many stations around the US which allows a station to be easily added to the system in Haiti. ASOS constantly monitor weather conditions on Earth's surface. They report data on sky conditions, surface visibility, precipitation, temperature, and wind. These stations help to improve data for forecasts and warnings which can be very useful for the country of Haiti. Finally we have the Advanced Weather Information Processing System. This is a combination of all of the previous devices and more. It puts this data into a graphical interface which our forecasters use to issue warnings, watches, and forecasts. After forecasts are prepared AWIPS generates weather graphics, hazardous weather watches, and warnings. All of these help our forecasters to forecast the weather faster and more efficiently. If Haiti is added to the US system with a combination of these technologies it becomes very easy for the US to help monitor Haitian weather. When a concern arises the US can contact Haiti and warn them about the volatile weather that is on its way. This allows Haitians to prepare for the weather and damage is lesser. Though this doesn't do much for their crops it allows them time to give their crop some form of protection. Weather systems in combination with Agroforestry can help to reduce damage done on crops due to volatile weather.

Within Haiti, the World Food Programme already works tirelessly to help feed the people of the country but this is not enough. The World Food Programme focuses more on the youth of the country and not the adult population. The program "feeds 365,000 children in 1,400 schools."

and is "The country's largest food safety net," (World Food Programme). We need to focus on a program in which we provide food to the adults in exchange for their involvement and work on a community project. These projects could include road dams and irrigation systems within the

different communities. We can create cards much like vaccination cards in which we document what projects people have completed and how much food they should be provided for these specific work projects. They can also verify if they have been provided with the food that they have been awarded. We can have people whether they are volunteers or actual employees who can oversee the projects and maybe even help with them. The issue with this is that the program can gather a negative view in the eyes of the Haitians. Someone is not doing their work the same as others and so many workers may get angry that they are still being provided with the same amount of food and that is why the volunteers are necessary. The program may look like we are slaving them away just for food and it can create a lot of resentment. However we can push the fact that completing these projects really does help in the long term because they are only doing projects with actual benefits not just busy work and they are also provided with food. This will increase the community's resilience and decrease their vulnerability to volatile weather while fixing the immediate food need. This is expensive though and would require about 110 million dollars which requires copious amounts of fundraising making this though helpful solution almost unattainable.

Both of these solutions require US foreign Aid, but how? Foreign Aid in the form of money (international relations aid) is the most likely thing that can help haitians. Though they may not be able to buy as much food since their food prices are higher than if they just had food supplied to them it is cheaper to give them money. If we were to supply them food the shipping prices would be very high and therefore we would not be able to supply them with much. For many people the government spending a lot of money on another country is not ideal especially in one that currently is having very high levels of civil unrest (president's assasination). It can also
help to suggest to those that are opposed, the idea that the government is providing aid that can be more dangerous to us the US such as Afghanistan and that the government can divert some of the money from countries like these and to one that is just a starving country. Also this aid to the country may help with some of its civil unrest within Haiti as many people are being provided with the basic necessities that they require to live. In 2019 US foreign aid topped $39 billion which composes 1% of the US spending for that year. If we were to get the government to up the amount of spending when it comes to foreign aid to allow more money to go to the country of Haiti to help those in need. When other countries see us doing this they may strive to be more like the US and help other countries in need, not only helping Haiti but also other underdeveloped countries.

Through fundraising and agroforestry, we can help to reinstate the ability of the Haitians to produce their own food despite the weather issues. As they are able to become less dependent

on emergency supplies they are able to attain that sense of food security that they have longed for decades.

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