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Haiti, Factor 1

Haiti: Using Plant Science to Improve Soil Quality and Ways of Life

Haiti makes up one third of the island of Hispaniola. It was first founded on December 6, 1492 by Christopher Columbus on his voyage to find a western route to China. When he arrived on the undiscovered island, which is now known as Haiti, it was dense forest and tropical plants. The native people, the Arawaks, were immediately put under Spanish rule. After the Spanish had taken what they had come for, like timber and other natural resources, the French took over control of the native Haitian people in 1697. When Haiti, known by the name of Saint-Dominique colony at the time, went under the control of the French, they became producers of sugar cane. Most of the work done by the Haitians on the sugar cane fields was done by slave labor. The slave labor was also used to cut down the trees in order to make way for the sugar cane fields. Cutting down the trees was the first big step to starting most of Haiti's problems today. The slaves cleared nearly all of the forested area in Haiti when tobacco was introduced as a cash crop. In 1791, 480,000 slaves revolted against the French slave-holders. The revolt lasted for ten years before any actual headway was gained for the slaves. In 1801, a declaration of independence was put forth by the slave called Toussaint L'Ouverture. Napoléon Bonaparte, seeing this, tried to stop this rebellion before it got too far out of hand, but he eventually failed. The slaves, under the direction of Jean-Jacques Dessalines, won their independence in 1804 after successfully ridding themselves of French rule. After the long rebellion, Dessalines finally gave a name to the country from the Arawak language. He called the country Haiti ("History of Haiti's Upheaval").

Since Haiti's independence, their economy has declined steadily to nearly nothing. An important date for Haiti was 1964 when Francois Duvalier declared himself president for life, the eighth president for life in Haiti's history, after he was elected in 1957. Duvalier changed the constitution of Haiti allowing him to be the only person on the ballot. This started a decline in Haiti's politics, because no longer could people vote for the right candidate but the only candidate. Also, Duvalier misused Haiti's aid funds from the United States, which caused President John F. Kennedy to pull relief away from Haiti. When, in 1971, Francois Duvalier died, his son, Jean-Claude Duvalier, replaced him at the age of nineteen. Immediately after Jean-Claude Duvalier became president, one of the worst droughts Haiti has ever seen happened from 1975 through 1977. The drought caused famine and killed the rice, tobacco and bean crops. Also in 1980, Hurricane Allen destroyed much of Haiti as well as the new crops that were to replace the crops destroyed by the drought. Most of these problems originated from the rule of the Spanish and the French when the Haitians were forced to take down forests for sugar cane and tobacco. Also, it comes from a vicious cycle that people go through to survive. The cycle is how the Haitians can't sell enough mangos to live, so they cut down timber for money. That timber was the only thing keeping the topsoil down. Poverty comes second only to the soil quality, because the soil quality is the reason why Haiti is so poor ("History of Haiti's Upheaval").

Haiti is one of the world's poorest countries with a high population density (Bell and Deronzil). The average Haitian's diet consists of rice as the carbohydrate, mostly imported, and mangos for vitamins C, A, and E. Both rice and mangoes are great sources of vitamins and minerals to ensure the betterment of structural growth in the human body. Vitamin A is essential and promotes bone growth and correct cell division, reducing the risk of cancer. Vitamin E is important in the function of the immune system and is

a vitamin that is burned like fat in the body. Therefore, improving soil quality and mango and rice production through education will enable the Haitians to become more self-sufficient in food production (“History of Haiti’s Upheaval”).

The average Haitian family lives in a dirt floor shack that is dilapidated and poorly insulated with no running water. Only 10% of Haitians have running water; not only that, but next to none of the households even have bathrooms or latrines (“Haiti’s Poverty Statistics”). This causes major problems with sanitation, because any open sores are infected through the filth that is nearly unavoidable. The conditions in which they are forced to live are unthinkable to most people, but for Haitians, it is just a way of life that continues daily.

Haitian families consist of three to four children on average. The children are commonly used as work hands for the family, earning money or helping out on the family farm. There are also over 380,000 orphan children in Haiti after the earthquake. Families struggle daily to feed everyone, and the farms aren’t enough to feed them, either. Recent studies show that “20% of children under the age of five suffer from chronic malnutrition” (“Haiti’s Poverty Statistics”).

With the lack of proper nutrition, many children are more prone to getting stomach and intestinal problems. Eighty percent of Haitians live on two dollars per day. That includes the expenses of food and other necessities like clothes and sleeping mats. Only 60% can live on one dollar per day (“Haiti’s Poverty Statistics”). Most Haitians can only afford to have one meal per day, and many can’t even eat on a daily basis. Much of the issue with the malnutrition revolves around the fact that Haiti is the poorest country in the western hemisphere and that most jobs that they do have aren’t steady paying jobs. There are many children that are forced into indentured servitude and don’t make a living.

Haitian farms consist of mostly one family farming a small area that has few plants. Since practically no Haitian farmers have machinery to plant and harvest, most are forced to use hand tools like hoes and plows. Though this may not seem like an extremely bad thing, it is not very efficient. Families work together to plant and harvest their crops. The children work after they get back from school, if they go to school, and work until the day ends. For most farmers, it is the only way that they have done it (Bell and Deronzil).

The type of farming that Haitians practice is very inefficient. The farmers plant in straight rows and on uneven ground. Planting in straight rows allows the dirt to erode away and it doesn’t stop the wind as effectively as using contour farming techniques. The planting on uneven ground makes the water pool away from the necessary areas, like flowing to the center and drowning the plants instead of corralling the water evenly across the field (Bell and Deronzil).

Haiti has had many problems with the erosion of the topsoil, which contains most of the essential nutrients for plant growth like potassium, nitrogen, and phosphorus. In order to stop erosion, the indigenous farmers must be taught to use contour farming techniques that were used to stop the displacement of topsoil during the Dust Bowl (Baumhardt). This will not only improve the common crops like beans and corn, but also help retain and replenish nutrients in the soil. Beans add a significant amount of nitrogen to the soil, and they also act as a type of net, keeping the soil stationary with thick roots. Adding decomposing paper will return phosphorus to the soil. Phosphorus adds strength to the plant stem

and leaf structure. The reason for using paper specifically is because paper consists of quite a bit of phosphorus and nitrogen.

Families can contribute to their farm's reconstruction of topsoil with the use of homemade compost barrels. Some missionaries have set up compost barrels from materials that were left over after the earthquake. Compost barrels can be created by putting decomposable materials into a dark-colored barrel with excrement. The dark colors on the barrel will heat up the contents making the materials decompose faster. The result of the decomposed matter is enriched soil-like material that can be mixed with the clay to have a fifty-fifty soil mixture. This would be slightly concentrated soil; it would help the soil and the plants. Each member of the family can help spread the compost onto the fields. Also, each family should plant barrier shrubs around their farms to keep the topsoil stationary.

The Haitians' dependence on foreign rice is counterproductive for the progression of food independence. Educating Haitians how to plant and harvest rice would allow them to become more independent from foreign food suppliers. The establishment of rice paddies on low lands with low drainage rate will help the Haitians to supply rice to their families and improve the economy of Haiti. The stimulation of the Haitian economy would allow the Haitians to save a significant amount of money for the improvement of living conditions.

The most important aspect to teach the Haitian about rice is how to efficiently grow rice without the use of too much water. Rice plants are set up in paddies that are commonly flooded, but since Haiti doesn't have the resources to use large amounts of drinking water to grow rice, the farmers will have to use a more efficient way of growing rice. There is a better way to produce a substantial amount of rice, and it is called "alternate wetting." Alternate wetting is where rice plants are watered in low-lying lands and let to dry for a day and then the plants are watered again. Another way to improve rice production is to find a swamp-like area that is always wet and unable to farm, and then plant the rice in square plots (Bouman).

The Haitian government could help with the implementation of new techniques by sending representatives to the areas where farmers are struggling the most and teach them the correct methods. This is possible because it has been done in other countries before. The United States sent people to educate the farmers of the dust bowl in ways to conserve soil and water through better farming techniques. This can only be done in Haiti by its own government. When other countries and organizations get involved, problems are caused. Some of the problems arise from the lack of knowledge of the area, so the wrong techniques are taught and everything is lost. The Haitian government is the only government that should get involved because the policies that are created can be more long term than foreign help. With the Haitian farmers taught through agricultural representatives of the Haitian government, the farmers will be able to move forward without causing harmful long term effects like deforestation and water pollution.

Since Haiti is a third world country, their education system isn't well funded by the Haitian government. Only 20% of Haitians have a sixth grade education or better. Many can't finish their education because of the lack of adequate funds above those going to living expenses. Only half of Haitian children even start school in the first place. Many children are on the streets and were orphaned after the devastating earthquake in 2010. A quarter of a million children can't go to school, because they are child servants in almost indentured-servitude predicaments ("Haiti's Poverty Statistics").

A major barrier that inhibits the progress of Haiti's food independence is the lack of education. Because many Haitians are not literate, instructions can't be properly relayed. For illiterate Haitians, reading directions that recommend what processes should be used and at what time can be a barrier. An example would be irrigation times and the proper way to do it; it's difficult to tell the average farmer to water in the morning at a certain temperature or to water at night if the temperature will be over ninety degrees. The language barrier may be difficult to overcome, but could be done with some education (Bell and Deronzil).

Another barrier that has caused difficulties for Haiti is the lack of imports and support from other countries through agriculture. Recently, the country of Vietnam has decided to work with nearby countries in South America, including Haiti, to export rice at low prices. Vietnam is also working on research for hybrid rice with Minister of Agriculture Thomas Jacques, and also research on cultivation of paddy rice and other agricultural techniques. Jacques has also encouraged Vietnamese investors to move to Haiti to strengthen the economy of both Haiti and Vietnam. Jacques also mentioned that investors should be encouraged to boost the sale of cut flowers, fruits and vegetables ("Haiti - Agriculture : Signing of an Agreement on Agricultural Cooperation with Vietnam."). The Haitian government needs reform and investments in the agriculture sector. The agriculture sector contributes to a quarter of the GDP of Haiti and 60% of families farm for their livelihood. Through small projects Haiti has seen an increase in yields and profits, but according to reports from Oxfam, called Planting Now, Haiti's changes are only short term. That is why the cooperation between Vietnam and Haiti is essential for Haiti's growth, economically ("Haiti Must Redouble Efforts to Boost Agriculture; Cannot Afford to Fail.").

The investors from Vietnam are helping the Haitian people by buying land and using it to grow crops and hire Haitian people to grow affordable rice for Haiti and nearby countries. This would greatly help to stimulate the Haitian economy and food markets. Also, with the new Vietnamese investors claiming territory in Haiti, progress can be taught to the current farmers. The Vietnamese rice farmers will bring with them the skill to effectively cultivate and grow superior strains of rice. These techniques can be taught to the current Haitian farmers through experience from the Vietnamese farmers. The only problem that may arise from this is the language barrier. Though Vietnamese investors would expect this problem, there can really only be one permanent solution to it and that is for the Vietnamese to learn the Haitian language. That is because a large majority of Haitians aren't even educated and cannot be expected to pick up a new language.

Since the earthquake in 2010, Haiti has received a lot of relief from countries and missionaries. The United States has sent relief funds to help with the cleanup of Haiti. In the past, United States helped Haiti until the Kennedy administration pulled relief funds away when the Haitian president misused funds. Missionaries have gone to Haiti to help build new houses and hospitals.

Haiti has had a difficult time since its independence from France. Famine and disasters have left the country of Haiti in almost complete disrepair. However, Haiti isn't lost, but in need of some help from outside sources. The people of Haiti have also asked people to not just give them food, but to give them aid that will help them in the long run, like improving soil quality so they can grow their own food. There have been some very important factors in the difficulties experienced by Haiti, ever since the founding of Haiti by Columbus. The deforestation of Haiti has been a major factor in the downfall of the productivity of produce. With the topsoil almost completely nonexistent, the Haitians haven't been able to grow

enough food to feed themselves. The modification of the way they plant and harvest their crops is the most effective way to change the condition that the Haitians live in. The second most important factor in restoring Haiti to its original state is to improve soil quality. To turn the production up on the produce will allow the Haitians to make more money to support their families. This, in the long run, will allow the economy to be improved through production. Increasing the nutrient levels in the soil will help the country to grow some of its natural wildlife. Growing more effective, taller plants will also help retain the topsoil. Since the ground is mostly clay, the water that Haiti gets washes off as clay does not allow water to penetrate the surface. Laying of proper topsoil, through the production of organic material from human waste and decomposing paper, will allow water to soak down and saturate the ground. Plant science is the best way to insure the food independence and economic health of Haiti.

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