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### **Haiti: Alleviating Micronutrient Deficiencies and Trying to Make Ends Meet**

In a country off the southeastern tip of Florida is a place that is completely unparalleled to the life that people in the United States are used to living. There are 10,714 square miles that make up the vast and mountainous country of Haiti, the poorest country in the Western Hemisphere (Project81 Haiti Relief). Haiti is part of the Island of Hispaniola which they share with the Dominican Republic. Portions of Haiti are occupied by large rivers, the country's main water supply; this is also where the majority of the farming occurs. There used to be lush forests that covered sixty percent of the land, but since 1925 the Haitians have chopped down all but three percent of trees. Without trees to anchor the soil, erosion has become a point of issue, which makes the land unsuitable for farming. The deforestation could be the cause of the Haitians inability to produce a self-sustaining agricultural state (Culture Grams).

Haiti is a country that does not have the luxury of food security. Seventy-eight percent of people are poor and they earn less than two U.S. dollars a day. Worse than that, fifty-four percent of people live in extreme poverty and these people earn less than one U.S. dollar per day (Haiti Partners). Issues that contribute to this country's poverty are the dry climate, mountainous terrain, lack of education, lack of government support and the limited access to food, resulting in Haitians having an unequal chance in society.

A typical family size in Haiti is approximately three or four children. In contrast, rural families have ten or more children, this way the parents will get more help with the daily chores. Most families keep in contact with their extended family. If a parent were to pass away, the grandparent would step in and act as the parent. Elders in the community are considered to have wisdom; they are very much valued members of society (Cultural Competency and Haitian Immigration). Most times this is who you would go to for advice.

Haiti is a place where sixty to eighty percent, or two-thirds of the people are farmers. These farmers own a tiny patch of land that is usually less than two acres (Open Your Heart to Haiti). The land is planted and cultivated by hand. Corn, beans, rice, yams, bananas, mangos, and many other types of fruit are what you would likely see growing on Haitian farms. What farmers are able to harvest is sometimes barely enough to feed their families due to the undesirable growing conditions. These include the mountainous terrain and erosion. Sometimes if the farmer is lucky he may have chickens, a pig, or even a goat.

Haiti's farming practices are outdated. This includes the absence of fertilizer, pesticide, machinery, and irrigation. Chemical fertilizers are not a financial option for many farmers, but if the farmer has livestock then he may use the manure to fertilize the crops. In America, farmers are able to keep plant diseases and insects to a minimum by using pesticides and herbicides, but pesticides as well as herbicides are unfamiliar to Haitians. This results in diseases being transferred by plants and insects. Machinery is nothing near what Americans picture as a tractor. The Haitians that are able to afford them have shabby two wheeled tractors. Concerning the livestock, veterinary care is near nonexistent. If the livestock were to get sick the farm would lose profit because the animal would have to be killed and the product would then be unusable (Farm Haiti Now). If Haitians were able to improve their farming abilities they would have greater yields and earn more money.

Although education is one of the most valued aspects of Haitian life, like food, most people are not able to afford it. To help make education attainable, family members will go to drastic measures. This can

include starving and not seeing their children for long periods of time while the child is away at school. During this time, rural children will likely stay with an urban relative. Schooling takes up to thirteen years of a child's life, if they are able to afford the cost of the education. There are six years of primary school and seven years of secondary education. It is also said to be extremely difficult to even get into secondary school (Culture Grams). To get into secondary school, students must pass a national exam. After secondary schooling, the families that can afford to may send their child to a university. The more wealthy families will presumably send their child or children to study abroad. Unfortunately, poor families usually are not able to afford to send their children to secondary schools. The more education you have the more likely you are to get a job. If you do not have the necessary education to get a formal job, the poverty cycle can recur.

Education is not the only concern for Haitians. Aforementioned, Haiti is a very poor country and does not have food security. The main diet of the average Haitian consists of rice and beans daily. When affordable, families may buy meat, usually pork. They also include salad and a vegetable for the main meal. When we as Americans think of our meals, we nearly always have a meat and vegetable in our diet for every meal. This illustrates how food security can be related to different countries. The United States, as a whole country, has a high level of food security; unlike Haiti.

Although rice and beans are the most common diet of Haitians, there are many less fortunate people in Haiti that cannot even afford to eat on a day to day basis. There are a large number of people who are starving, and all they can afford to eat is the mud pies made mostly by Haitian women. With luck, the people eating the mud pies may actually consume some nutrients that come from the yellowish soil found in the nation's central highlands (Open Salon, 2010). To these people, even a bowl of rice is luxury. Malnutrition by definition is the lack of proper nutrients. This is usually caused by lack of environmental and social resources or by poverty. Eighty percent of people in Haiti are classified as in poverty. For some Haitians, they have the choice between eating mud pies and literally having no food. Most choose the mud pies; this comes with health risks such as intestinal worms. The worms will consume approximately twenty-five percent of the nutrients that a person consumes (Culture Grams).

For many children, malnutrition is very realistic. A result of malnutrition is death, which is sadly, what happens to many children. Families often don't have enough food to feed a new baby, as a result it passes away. If by chance, the baby did survive, some mothers are not able to breastfeed because of malnutrition. The result of this is babies will not gain the necessary nutrients to survive. Most likely, if the parents are malnourished, the child too will be malnourished. Commonly, a child's mother may go hungry, instead of having it happen to their children.

Currently in Haiti twenty-four percent of children have chronic malnutrition and nine percent have acute malnutrition (Project81 Haiti Relief). Adding to those figures, 1.9 million people live in fear of not knowing where their next meal is coming from (World Food Programme). Prior to the earthquake that hit Haiti in 2010 these numbers were lower. Still today there are people trying to rebuild the country in efforts to lower the poverty rate, which in turn will lower malnutrition rate.

By alleviating malnutrition there will be fewer deaths, more jobs, therefore more people to work in those jobs. The leading cause of death in Haiti is malnutrition, so when malnutrition becomes less of a problem there will be fewer deaths. More jobs will be created as a product of helping stop malnutrition, in turn more Haitians will be able to buy food. This means there will be more people working, subsequently more people will have access to jobs to provide the money.

Along with malnutrition, clean water scarcity is also something that is affecting Haitians. Fifty percent of Haitians do not have clean drinking water, but Haitians do not have anything else to drink, so they are forced to drink the water that is unsafe (World Food Programme). Many times the water contains Cholera,

a water disease that causes diarrhea and constant dehydration. To counteract the Cholera epidemic, I came across an idea that will clean water for the Haitians. The system is called a Filterpure, this structure uses a regular clay pot and with colloidal silvers mixed in with layers of saw dust and clay. As two and a half liters of water passes through the clay pot each hour, the silver particles are able to kill bacteria and viruses. The water that comes out of the pot is then ninety nine percent clean which makes the water one hundred percent drinkable (Filterpure Distributes Clay Pot Water Filters to Developing Nations).

Health care is a huge concern and something that Haiti lacks. Quite often people in Haiti lack the most basic health care necessities. The sanitation of Haiti is less than adequate. To add upon this, the earthquake in 2010 knocked down many of the already shabby houses. As the result of the earthquake many people were forced to live in tents (Project81 Haiti Relief). This type of living arrangement spreads many harmful and life-threatening diseases such as malaria, tuberculosis, HIV, and AIDS.

Overall the country of Haiti has an unreliable health care system. People who are in need of health care would first need to find the nearest health care facility. They then would be required to provide their own ride to the hospital, since in Haiti there is not a reliable ambulance system. If a person was fortunate enough to make it to the hospital, they would have trouble being seen by a physician due to there being a higher ratio of patients to doctors. Once that person had been treated by a doctor, the patient would have to figure out how to pay directly out of pocket for the services the hospital provided. This, for most people, is near impossible to pay (Open Your Heart To Haiti).

Partners in Health is an organization that is trying to help Haiti eliminate water pollution and malnutrition. They have been working to reconstruct their economy since the earthquake of 2010. Partners in Health was started by the Church of Christ in 2002. To help Haiti, Partners in Health came up with the idea of a peanut-based product that will help reduce malnutrition called Nourimanba. For the past two years they have been working to clear up the Cholera epidemic in Haiti. If there were to be more donations given to Partners in Health they would be able to help feed more people and help stop world hunger. Apart from solving hunger, they also give medical attention to people who need help. Overall this organization has been very diligent in helping to provide better lives for Haitians (Partners in Health).

After analyzing the problems in Haiti, I believe that the problems lie within the government. To create a better country, first the infrastructure needs to be improved. This will draw potential businesses into the area. One of the reasons that businesses are not drawn to Haiti is because it is prone to earthquakes and hurricanes. If those businesses were to make their buildings earthquake and hurricane resistant, they may be more likely to set up a business in Haiti. The government would then be provided with more taxes. These taxes include sales taxes, property taxes, and income tax. This would then boost the government and they would not have to import as much as they do, because currently Haiti imports 2.928 billion dollars and only exports 801.7 million dollars, according to (Haiti's Economy Profile 2013). With the new tax money the government would then be able to afford sending children to public school.

Workers have to be strong enough to perform their task in the jobs, and this can't happen if the people of Haiti are malnourished. This leads to my suggestions regarding solving malnutrition in Haiti. Three ways to combat malnutrition are biofortification, Nourimanba, and a machine called the SolarFlex. Biofortification is a process that uses the crops that the Haitians are accustomed to growing. By using conventional breeding, scientists are then able to make the common crop more nutritional. Currently rice and beans are a staple in most Haitians diets. When using biofortification those two crops could be enhanced to contain more zinc and iron. Apart from those two crops there are other crops that have the potential to be biofortified. There is also zinc biofortified wheat, sweet potato, and maize. Sweet potatoes can also be iron biofortified. Finally, scientists were able to make crops provitamin A carotenoid biofortified sweet potatoes and maize (Biofortification of Staple Crops). The process of biofortification is very beneficial because not only does it give the people of Haiti more nutrients, it also makes them self-

sufficient. After the first seeds have been given to the rural farmers by either the government or a non-profit organization, the seeds will be able to germinate year after year. A question that farmers may ask about biofortified seeds is, "Will it hinder the yields that I was producing?" The answer is no. Scientists have proven that not only will you have the same amount of crop, but biofortified seeds have also been shown to help the soil (Nestle, Penelope). By using biofortified seeds, a family will be able to grow the crops they are accustomed to, receive more nutrients, and be self-sufficient (Nestle, Penelope).

Nourimanba, a peanut-based substance, also would make people more self-sufficient. The peanut-based substance was first introduced to Haitians by Partners in Health. The Partners in Health volunteers showed how to make the simple Nourimanba, which contains peanut butter, milk powder, vegetable oil, sugar, and finally a vitamin packet. Nourimanba is fast working, taking six to eight weeks to completely treat a severely malnourished child. Currently, Partners in Health is providing the ingredients for the Haitian people. This poses a problem. If this organization would stop funding Nourimanba in Haiti the Haitians would have no way of receiving these ingredients. To avoid this, I suggest that they should not only teach the community how to make this product, but also provide them with stock of the ingredients for Nourimanba (How Haiti's Peanut Crop is Saving Lives and Creating New Economic Opportunities).

My final suggestion in combating malnutrition is the SolarFlex. With this machine funded by Malnutrition Matters, ten to twenty kilograms of wet fruit can be made into dry preserved fruit to use throughout the year when that crop isn't being harvested. The machine works by moving air horizontally across the food. The SolarFlex is powered by solar panels that have the ability to tilt to accommodate for different latitudes and seasons. The government plays a role in this suggestion because the cost of the SolarFlex is too great for a community to buy together. With help from the government a community could get a SolarFlex between \$1,400 and \$1,900. This machine would then give Haitians the ability to get nutrients from foods that are not in season.

Once jobs are available and Haitians are healthy enough to work, education for a formal job is required. I believe that education is one of the most valuable tools you can use to help relieve poverty. I suggest that the government create public school system. The very least a person needs to be able to learn is a knowledgeable educator and a common place to gather. The most preferable idea of a school would be some place children could call a safe haven. In this place they would learn the skills to be successful in life. Students would also be provided with a hot meal. In these government funded schools, anyone of age can go to school for little to no cost. This in turn would save people from starving in order to keep their children in school. In addition, it would give jobs to people, such as teachers and janitors. After completing their education, a child has a better chance at being successful in life and being able to start a family without worrying about where the next meal will be coming from. Education also gives Haitians a sense of accomplishment.

The safe haven type of school would be costly. Meals, supplies for students, school buildings, transportation, and educators all come at a price. The funding for these schools would come in time from the businesses that came into Haiti because of the improved infrastructure. People in the community could help aid these schools because the positions such as a janitor could be filled by someone who wasn't able to afford education. Other jobs created by the schools that could be filled by the local community are the construction workers. Overall a public school system would benefit the children in the community as well as the adults.

Concluding, Haiti is an unstable country that suffers from malnutrition. This is the result of eighty percent of Haitians living in poverty. The factors indicated could be attributed to two-thirds of the Haitian population not having formal jobs that give them a living wage. Most Haitians live off fewer than two U.S. dollars a day. For some it is even less and they are not able to get necessary nutrients. Healthcare in Haiti is not common. Haiti does not have anyone to cure common diseases and foreign aid is only

available to the most serious victims. This brings attention to another problem, education. Parents will starve to make sure their child gets an education. The child's education normally lasts only six years. A full term of school requires thirteen years; secondary school is the following seven years. There are few people who are able to attend secondary school. This is because some families cannot afford it, and others could not pass the final exam.

The terrain of Haiti affects the agriculture. Haiti has a mountainous and rugged terrain, which is suitable for producing coffee, Haiti's main export, but not many other crops. Another factor that complicates Haiti's agricultural production is erosion. Ninety-seven percent of the trees in Haiti were cut down. This resulted in erosion which depleted the good soil and transferred it to the ocean. The recommendations I had come up with to help Haiti become a self-sufficient country include making education public and creating a better infrastructure. To help manage malnutrition, biofortification, Nourimanba, and the SolarFlex are all ideas that the Haitians will be able to use to combat malnutrition. Through my research paper I have learned much about Haiti's culture and the way of life, and I believe that "*if you can't feed one hundred people, then just feed one*" (Mother Teresa).

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