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Haiti, Factor 6: Sustainable Agriculture

Helping Haitians Find Hope

People strive to be number one: number one in 2A wrestling--a number one draft pick--a one rating in speech or choir; however, when we are speaking in terms of poverty, food insecurity, and hunger, the number one ranking is devastating, especially if a person is from Haiti. Haiti is the poorest nation in the Western Hemisphere and the second most densely populated (Rural Life in Haiti 1). Even after the tremendous outpouring of assistance following the 7.0 magnitude earthquake that struck Haiti in 2010, there are still serious issues facing the Caribbean island nation---depleted soils, unsustainable agricultural practices, and limited access to education and progressive information. The issues the ordinary Haitian faces occur on a daily basis and are restricting the people from potential prosperity.

The issues facing Haiti have a personal connection to my family. Three years ago, my family was blessed with the adoption of a five-year old boy, Danson, from Les Cayes, a southern port city in Haiti. Danson, came to the United States for open heart surgery in New Jersey. Up until that time, I knew very little about Haiti, but ever since, the country and the people hold a special spot in my heart. For these reasons, I want to do everything I can to help the people of Haiti, starting with learning as much as I can about the Caribbean island country. Although the people of Haiti face many problems, there are people and organizations willing to help. Before the quake, many people did not know about the issues facing Haiti, but ever since the earthquake, many groups and organizations have stepped up to help fill the void in resolving the serious issues the country and its people face.

There are many more dire issues facing Haiti than poverty. Rapid population growth and periods of economic recession due primarily to political and social upheaval have certainly contributed to the abject poverty for most of the Haitian population. This along with lack of educational opportunities, inadequate infrastructure, vulnerability to natural disasters, and unsustainable use of natural resources has made Haiti a “poster child” for developing countries in need of assistance.

“Haiti is the poorest country in the Western Hemisphere: 80 percent of the population living below the poverty line, and 54 percent of the population living in abject poverty” (Blajchman 1). According to Shah, the top one percent of the population controls over half of the nation’s wealth (1). Rural inhabitants have a per capita income that is about one third that of those who live in urban areas. Access to health care is equally dismal. There is 0.25 physicians and only 0.8 hospital beds per 1,000 people. Life expectancy in Haiti ranks 154th out of 196 countries in the world (Haiti Health Stats 1).

Haiti’s long standing history of instability originates from decades of failed political and economic development. Furthermore, widespread corruption at all levels of the Haitian government has diminished the ability of the government to help solve the issue of sustainable agriculture. The lack of government accountability and transparency is a major concern of donors. “The government of Haiti has received just one percent of humanitarian aid and somewhere between fifteen and 21 percent of longer-term relief aid”

(Ramachandran and Walz 1). Therefore, NGO's and private contractors have received the large majority of aid donated to Haiti. In short, significant changes would need to be made in the government as it currently functions for it to become a central figure in solving major issues facing the Haitian people.

Agriculture is the primary income-generating activity for rural Haitians, who represent 60 percent of the country's population (Haiti 2). Most rural communities in Haiti consist of several hundred houses on small plots of land. The houses are made of concrete block with thatched roofs of woven leaves. The typical house consists of one to two rooms with a dirt floor, approximately 160 square feet. The typical household has between six to ten members but may only have two to three beds, if any (Rural Life in Haiti 1). A typical rural family does most of the cooking over an open fire where items such as rice, sweet potatoes, and beans are staples. Meat is a luxury in Haiti (Rural Life in Haiti 3).

One of the most critical challenges facing Haiti today is the lack of sustainability in its agricultural sector. Two-thirds of all Haitians depend on the rural agricultural sector, which is mainly small-scale subsistence farming where people eat only what they grow (ORE1). The rest must be purchased with a limited income of less than $400 per year (Haiti At A Glance 1). According to Hylkema, it is estimated that only one-sixth of the land currently cultivated in Haiti is actually suitable for agriculture (1). Moreover, the yields on the average farm of one hectare (nearly 2.5 acres) are some of the lowest in the geographical region.

There are three critical unsustainable agricultural practices that must be addressed if Haiti is to become the productive food-producing country it has the potential to be. These include deforestation, low soil fertility, and lack of progressive agricultural education.

Haiti remains the only country in the Western Hemisphere in which the majority of people practice subsistence farming. However, Haiti's urban population is expected to surpass the rural population by 2025. According to a case study conducted by McClintock, with the population growing at a rate of 2.1 percent, this trend towards urban migration will further exhaust natural resources to meet the needs of the urban population (3).

Haiti was three-fourths forested when the Europeans arrived. Tropical forests covered 60 percent of Haiti in 1923, but that is certainly not the case today (Haiti Reforestation Act of 2011 1). According to Velasquez-Manoff, every year, the nine million and growing populace uses the equivalent of 30 million trees for charcoal and firewood, but only 10 million trees are planted to replace those harvested (3). Charcoal and firewood provide 85 to 90 percent of Haiti's energy for home and industrial use, with rural firewood consumption estimated at 500 kg per person per year (Lemuel Ministries 1). More specifically, 62 percent of Port-au-Prince, Haiti's capital, relies solely on charcoal for cooking and heating, which amounts to roughly 0.44kg per person per day" (McClintock 4). Declining soil fertility and falling commodity prices have led many rural Haitians to intensify charcoal production as a means of guaranteeing cash income. According to McClintock,with an annual deforestation rate of 5.7 percent, one of the highest in the world, Haiti's remaining 880 km2 or roughly 100,000 acres of forested land is gravely threatened (4). As a result, less than two percent of Haiti's original forests remain due to a continuing dependence on tree wood and charcoal for cooking and heating needs (Timberland 1). Even the mango and avocado trees are vanishing, destroying a vital food source in favor of another necessity for the impoverished - charcoal for cooking. As the trees are felled, the topsoil is washed away and what

is left is not capable of absorbing rainfall. Blajchman stated Haiti is losing an estimated 6,000 hectares of soil each year to erosion (2). Furthermore, less tree cover also means less regular rainfall, since trees "breathe" water vapor into the air. Consequently, farmers who are the backbone of Haiti's economy, suffer from a decreasing water table, making their situation even more dire.

The loss of 98 percent of Haiti's tree cover has contributed significantly to a host of profound, persistent, and devastating socioeconomic problems. Erosion due to the loss of trees and their roots, further exacerbates the other natural disasters Haiti experiences during tropical storms, hurricanes, and earthquakes. Flooding and mudslides damage crucial infrastructure such as dams, irrigation systems, roads, and coastal marine ecosystems. The lack of trees has also made the climate harsher for people by reducing shade cover and removing protection from Haiti's torrential rains.

Another major factor contributing to chronic poverty and malnutrition in rural Haiti is soil infertility (Bargout and Raizada 1). Although Haitians depend on the soil for their livelihood, the tropical soil of Haiti is notorious for its lack of fertility. Natural physical factors contribute to soil infertility and erosion in Haiti, including slope, rainfall patterns, soil types, and the unsustainable farming practices of impoverished landholders. Tropical soils form year-around in hot, tropical climates, making the soil highly weathered. The soil is low in phosphorus and potassium, and it is often calcareous with ph levels over 7.5. According to Kinsinger, in some regions the topsoil is only five to six inches deep due to erosion (1).

The topography in the rural areas is also a contributor to the stability of production agriculture. The majority of Haiti's rural population has access only to steep hillsides for subsistence agriculture where maize, beans, cassava, and fruit is grown (McClintock 2). As a result, most hillsides are noticeably eroded. Gully erosion is endemic, especially along rural footpaths and roads, seriously compromising both soil fertility and crop yields.

Haiti's two growing seasons, with intense rainfall, cause precious topsoil to be lost downhill, silting rivers below. "Some 36 million tons of valuable topsoil is swept away yearly" (Velasquez-Manoff 3). As stated by McClintock, in semi-arid regions, excessive silting has reduced river flow by 80 percent threatening drinking water sources and hydroelectric power production (3). Heavy buildup of sediment in the fertile flood plains has also reduced drainage and caused salinity of the soil and groundwater to increase.

Haiti has one of the worst educational systems in the world. Most students speak native Creole, but they are taught in French. According to Franz, there is no universal public education system funded by the government (2). Most schools are private which provides an additional barrier to education with some families paying up to 60 percent of their incomes to educate their children (TWB 2013 1). Haiti's enrollment rate is 76 percent at the primary level and only 22 percent at the secondary level (TWB 2012 1). Haiti's literacy rate of about 53 percent (55 percent for males and 51 percent for females) is below the 90 percent average literacy rate for other Latin American and Caribbean countries (Haiti Literate 1).

Not only does the country face shortages in educational supplies, but it also lacks qualified educators. Nearly 84 percent of the teachers in Haiti's schools are not qualified or properly trained (TWB 2013 1). Therefore, access is not the only problem, but the quality of the education for those few who can attend is

poor. In rural areas, access to quality education is compounded by poverty and limited access. One quarter of Haiti's political districts are located in rural areas that do not have even one school (IJDH 1). Overcoming these challenges to provide Haitian children a basic education is a paramount issue. Simply becoming literate and being able to function in society is the goal Haitian parents are seeking for their children. Furthermore, a literate rural population is crucial if progressive agricultural methods are to be adopted and practiced. Farmers will likely not be able to adopt progressive practices and use new technologies if they have not acquired and practiced strong literacy skills.

Although Haiti is facing major issues, there is still hope. The Haitian government and other organizations need to provide rural farmers the opportunity to diversify their production, to preserve their natural resources, and to learn and practice progressive methods leading to increased income. This will allow farmers to invest in their operations and their communities.

Haiti was once one of the most agriculturally-productive countries in the world, even though such a small percentage of the land is farmable. To combat deforestation and increase soil fertility there needs to be fostering of sustainable agroforestry programs that will provide farmers with the tools and training to successfully implement the production of nursery tree seedlings.

In addition, sustainable agro-forestry programs will have multiple benefits to Haitians. Higher yields also mean more crops to sell and an increase in much needed shade. Instead of using a traditional Non-Governmental Organization (NGO) approach of a cash-for work program, programs that offer farmers the opportunity to volunteer to grow trees in order to earn seed, tools, and training would be the most successful. This program could include education and information regarding the best ways to cultivate an appropriate mix of plants and tree crops on their lands. An example of a plant and tree combination may be leguminous trees such as leucaena leucocephala (sometimes called jumbay) with food staples like beans and maize. As a result, the farmers would see a return on healthier soils, land, and water resources, in addition to, higher quality crops and greater yields. An agroforestry project designed on this foundation will result in a sustainable, robust, and resilient mix of plant and tree crops which will raise farmers' incomes and give them free time to engage in family and community-based activities and work development projects.

One of the most widely promoted agro-forestry techniques in Haiti is alley cropping with contour hedgerows of the jumbay shrub, previously mentioned. With this practice, the hedgerows must be spaced more closely at the top of the slope in order to slow erosion and improve soil fertility. The shrubs are periodically trimmed and the prunings are spread as mulch between the rows where they release nutrients for food crops and contribute organic matter to the soil. In 1992, approximately 1.4 million meters of hedgerows were established throughout Haiti. According to McClintock, the contour hedgerow technique saved roughly 350,000 metric tons of soil per year (8).

Carbon Roots International (CRI), which works with smallholder farmers and entrepreneurs, is another example of an NGO with an innovative approach to sustainability issues. This organization helps Haitians produce carbon-rich char from agricultural waste such as sugarcane bagasse, the fibrous matter that remains after sugarcane stalks are crushed to extract their juice. This creates two innovative products:

renewable charcoal briquettes for heating and cooking called “green charcoal” and “biochar” a natural soil additive that increases soil fertility and removes carbon from the atmosphere.

There are alternatives to open fires burning traditional charcoal and wood for heating and cooking in homes. Biogas stoves use a simple metal barrel like those used for oil storage as the base for this relatively simple technology. Animal and plant waste in digesters provide the gas used. This alternative energy technology was developed by members of an NGO called Emerging Opportunities for Sustainability (EOS), founded by a group of Iowa State University (ISU) School of Engineering alumni. It has been successfully used in over 100,000 homes in Nicaragua. Basic cookstoves, easily made with a closed concrete base with a vented metal stovetop, is another alternative to inefficient open fires used by over 3 billion low-income people worldwide (Household Air Pollution and Health 1). The use of the biogas burners and more efficient cookstoves reduces the need for wood, thus reducing deforestation (Biogas Stove 1). An added benefit of biogas is improved household air quality. This improvement is crucial since over 50 percent of premature deaths in children under the age of five worldwide is due to pneumonia caused by soot inhaled from household pollution (Household Air Pollution and Health 1).

One way to revive local agricultural production is by promoting the use of compost and other sustainable methods to rebuild soil quality. Sustainable Organic Integrated Livelihoods (SOIL) focuses on developing innovative composting methods to rebuild the soil and increase soil fertility. This is done by developing social business models around ecological sanitation where nutrients from human waste are returned to the soil rather than polluting freshwater resources (Our Soil 1). Any program implemented in Haiti would need to utilize low-cost technologies that are simple and easy to replicate. For example, Hawkeye Community College in Waterloo, Iowa, recently visited Haiti through its Global Agriculture Learning Center program. Hawkeye students demonstrated simple soil testing procedures and met with local farmers and students to discuss successful sustainable agricultural practices. Haitians are hungry for simple technology and information sharing.

The most ideal way for Haitian farmers to deal with the pressing issues of agricultural sustainability and production is for them to become more independent by making changes on their own with support from world organizations. One key element is to increase literacy, especially in rural areas. Teaching and implementing progressive farming methods will be much easier if farmer stakeholders can access and use information themselves. If programs are implemented to help teach adults basic agricultural management practices, it will give farmers the opportunity to improve their operations and their lives.

Haitians need to have access to nationwide outreach programs modeled after the ISU extension programs allowing them to have instant access to information pertaining to their production practices. An extension program could be used to demonstrate various forms of farming practices, using demonstration plots to teach about the use of agroforestry methods, soil testing, cover crops, and crop rotation as a means of diversifying crop production. Farmers need to access information from internet, radio, pamphlets, and video sources. A natural outgrowth of this would be the formation of agricultural youth organizations such as 4-H and the FFA, which would empower Haitian youth with access to knowledge and access to resources to secure a better life for themselves and their families.

Effective education is critical to cultivating a new generation of leaders. One way to provide a foundation for future Haitian leaders is with the help of fellow Haitians who have left the island nation and have received education and experience elsewhere. These Haitian nationals need to return to their homeland to create mentor-mentee relationships and share their education and experience within that relationship.

Haiti has the potential to have a productive agricultural system. Developed countries from around the world must continue to help Haitians help themselves. Haitian agriculture needs to move beyond subsistence farming by reducing deforestation and promoting sound agro-forestry practices, in addition to composting and developing green charcoal. This will also help reduce soil erosion, leading to increased soil fertility. By better educating both adults and youth about these progressive agricultural practices Haiti will grow a new generation of agriculturalists better equipped to deal with the realities of the country's natural resources. By taking action now, Haiti can move from number one in poverty to one of the top agricultural producers in the region. If I were to visit my brother's native land sometime in the future, I would hope to see a vibrant and productive agriculture system, one that I would be proud to be a part of.

Works Cited

Bargout, Remy N., and Manish N. Raizada. "Soil Nutrient Management in Haiti, Pre-Columbus to the Present Day: Lessons for Future Agricultural Interventions." *Agriculture and Food Security*. N.p., 11 Feb. 2015. Web. 23 Mar. 2015.

"Biogas Stove." *EOS International*. N.p., Apr. 2013. Web. Feb. 2015.

Blajchman, Amiel. "Haiti's Poverty Is Directly Linked to Deforestation and Habitat Loss - Red, Green, and Blue." *Red Green and Blue*. N.p., 10 May 2009. Web. 24 Mar. 2015.

Franz, Paul. "Improving Access to Education in Haiti." *Pulitzer Center*. N.p., 25 Oct. 2010. Web. 24 Mar. 2015.

"Haiti." *International Review of the Red Cross* 12.137 (1972): 465.*International Fund for Agricultural Development*. IFAD. Web.

"Haiti At A Glance:." *About Haiti*. Haiti Health Ministries, n.d. Web. 23 Feb. 2015.

"Haiti Environmental Degradation" StudyMode.com. 03 2008. 2008. 03 2008 <http://www.studymode.com/essays/Haiti-Environmental-Degradation-137114.html>.

Haiti Health Stats. *Nation Master*. N.p., Aug. 2008. Web. Feb. 2015.

"Haiti Literate." *The Haitian Alliance*. N.p., n.d. Web. 24 Mar. 2015.

“Haiti Reforestation Act of 2011." *Gpo.gov*. Congressional Record, n.d. Web. 23 Mar. 2015.

"Household Air Pollution and Health." *WHO*. World Health Organization, Mar. 2014. Web. 27 Mar. 2015.

Hylkema Amy: *Haiti Soil fertility analysis and crop interpretations for principal crops in the five winner watershed zones of intervention*. : University of Florida, Institute of Food and Agricultural Sciences; 2011. Thesis

"Institute for Justice and Democracy in Haiti." *Institute for Justice and Democracy in Haiti*. N.p., n.d. Web. 24 Mar. 2015.

Kinsinger, Brad. "What in the World?!?!?" *What in the World?!?!?* Hawkeye Community College, 12 Feb. 2015. Web. 23 Feb. 2015.

Lemuel Ministries. *: Dreams in the Desert*. Lemuel Ministries, 20 Sept. 2014. Web. 23 Feb. 2015.

McClintock, Nathan . "Agroforestry and Sustainable Resource Conservation in Haiti: A Case Study" 2003

"News." *Haiti Improves Access to Education with a Targeted Government Strategy*. N.p., 21 Nov. 2012. Web. 24 Mar. 2015.

"ORGANIZATION FOR THE REHABILITATION OF THE ENVIRONMENT." *ORE Development Projects in Haiti: To Improve Environmental, Agricultural and Economic Conditions*. Organization for the Rehabilitation of the Environment, n.d. Web. 23 Feb. 2015.

Ramachandran, Vijaya, and Julie Walz. "Where Has All the Money Gone?"*Music Educators Journal* 55.5 (1969): 64. *Center for Global Development*. May 2012. Web. July 30.

"Rural Life in Haiti :." *Rural Life In Haiti; Economic Autonomy for Haitian Coffee Farmers Is Singing Rooster's Goal*. Singing Rooster, n.d. Web. 23 Feb. 2015.

"Results." *Improving Access to Schooling and Learning for Poor Children in Rural Haiti*. N.p., 25 Nov. 2013. Web. 24 Mar. 2015.

Shah, Anup. "Haiti." - *Global Issues*. N.p., 1 Oct. 2010. Web. 18 Mar. 2015.

"SOIL Haiti." *SOIL Haiti*. N.p., n.d. Web. 23 Feb. 2015.

"Timberland Community | Haiti." *Timberland Community*. Timberland Community, Feb. 2010. Web. 23 Feb. 2015.

Velasquez-Manoff, Moises. "After the Earthquake: Haiti's Deforestation Needs Attention." *The Christian Science Monitor*. The Christian Science Monitor, 20 Jan. 2010. Web. 23 Feb. 2015.