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Haiti, Soil Fertility

Haiti: Restoring Depleted Soil

Haiti is the most mountainous nation in the Caribbean. *Hayti* is the Indian name for the country and means "land of the mountains." Haiti's mountain peaks reach over 8,000 feet. Haiti is a Caribbean country that shares the island of Hispaniola with the Dominican Republic to its east. Haiti makes up the western one-third of Hispaniola, while the Dominican Republic makes up the other two-thirds of the island. 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. But during February through May, the weather is very wet. Northeast trade winds bring rains during the wet season.

On January 1, 1804, Haiti gained its independence from France, and became the second oldest independent nation in the Western Hemisphere, after the U.S. More than 70 different dictators ruled Haiti between 1804-1915. Haiti is 27,750 sq. km in size, which is slightly smaller than the state of Maryland and roughly equal to the state of Vermont. By land size, Haiti is the third largest country in the Caribbean, after number one Cuba and number two the Dominican Republic. Today it's officially called Republic of Haiti and has separation of powers among executive, legislative, and judicial branches. The official languages of Haiti include French and Haitian Creole. Canada is the only other independent nation in the Americas that has French as an official language.

A 7.0 magnitude earthquake struck 14 miles west of Haiti in January 2010, destroying most of the capital of Port-au-Prince. The estimated death toll from this quake exceeds 300,000 people. Haiti is also regularly ravaged by Caribbean hurricanes. Although these life-changing events occur, tourism is one of the largest industries in Haiti, with nearly a million visitors arriving by cruise ship each year.

Today, the Haitian population is about 11,100,684. Life span estimates for the country must explicitly take into account the effects of excess mortality due to the prevalence of AIDS; this can result in lower life expectancy, higher infant mortality, higher death rates, lower population growth rates, and changes in the distribution of population by age and sex than would otherwise be expected. Within the population of 11,100,684, 60.9% is urban and about 47.6 % is rural .

The average size of a Haitian farm is about one-half acre to three acres, and on this farm lives a typical Haitian family which has seven to eight children and two parents. The family may speak Creole, the country's official language, or French. Research shows that all members of the family attain the average of a middle school education. The parents are between the ages of 25 to 28 years old and kids are between 3 and 9. Typically, young kids attend school but unpredictable events may occur leaving the parents to worry that their child may not be getting an education, because of this Haiti lags behind in information and use of technology. This in turn causes them to be behind in the agricultural area and access to information to improve farming practices to increase crop yield.

In a typical Haitian family, men and women both have a fairly equal status. 75 percent of the men live on less than \$2 a day, and likely cannot afford the seeds, irrigation, pesticides, and herbicides that would make farming a profitable business. Normally, the males deal with farming and physical labor, as the females deal with childcare. They both have a full commitment to family. Families with children are very common and parents take pride in their children. Children do work when of age and help contribute to the family. Most rural families are illiterate and there are not many opportunities for sanitary living in the countryside.

Haitian homes are but the size of an American living room. They call their home a hut; most of them are poorly built, using materials like mud, a thatch roof, and possibly scraps of lumber and rags. There is a window with no glass and a doorway with no door in a typical hut. The family is isolated in the highlands where running water, electricity and indoor plumbing have yet to reach them. This hut is often a home for more than two generations.

Haiti's population and geography contribute to its poverty issue. A great quantity of the land in Haiti is uninhabitable because of the numerous mountain ranges. The result is that limited agricultural resources have to be divided among vast numbers of people. At one point, the arable land in Haiti was plentiful but over the years, the population has increased and crop production has decreased.

Agriculture is the main source of income for Haiti. Unfortunately, agriculture has been compromised by drought and floods in the northeast over the last four years. Poor farming techniques are a major reason that Haitians suffer from poverty. Lack of fertile soil, use of improper farming techniques, and the lack of affordable products interfere with modern farming. Heavy machinery such as tractors, cultivators, and seeders, along with modern irrigation systems are very expensive. Seeing that most Haitian farmers don't own any heavy equipment, they are forced to rely on primitive methods to raise crops. Farmers plant crop seed by hand, cultivate the soil with small tools they can afford, and are forced to rely on the rain fall to irrigate their land. These heavy rains often contribute to soil erosion. Along with outdated farming practices, Haiti's land is suffering due to deforestation. Approximately 3% of Haiti's once forested country is still covered with trees. Trees hold the soil together and the leaves fallen from trees serve as the organic decomposers that protect topsoil from rainfall. Without forest cover, the land is bare and sensitive to weathering. Deforestation has caused runoff to remain on the soil eroding the land. This causes soil infertility, mudslides, and reduces water quality. In many areas massive flooding occurs. This makes the roads muddy and destroys rural area homes. Many people have been forced to move into overcrowded cities to stay clear of the flooding, erosion.

Along with deforestation the animal life has also been decreasing because of habitat depletion, and they have been hunted to provide food. The rivers in Haiti are not easy to navigate, which makes it very difficult to be used for transportation with ease. It also is very unsanitary water, as 37% of the nation's water is not drinkable. Many of the people in Haiti die from simple diseases every day. This is because there is a limited medical system aside from volunteers from other countries. In addition, there are few organized hospitals and transportation is often inaccessible. This causes a very high death rate in Haiti. The rates of birth and infant mortality are high, and roughly two-fifths of the population is under 15 years of age.

Haitians' main cash crops are coffee, plantain (banana family), yams, and sugar cane. The environment and weather allow for these crops to grow better here than in most other countries. Only one-fifth of the land in Haiti is able to sustain crops. There are few natural resources, although there are some small deposits of copper and gold but not necessarily a sufficient amount to mine. Near the coast, Haitians eat fish that the men catch using hollowed out logs as fishing boats. Further inland, Haitian farmers work approximately ½- 3 acres, but it is estimated that the average family requires about 3 acres to live normally, an amount of land which very few Haitian farmers have. The largest Haitian exports are mangoes and coffee, but they also raise corn and sweet potatoes. Haiti imports 48 percent of its food, including and close to 400,000 tons of rice each year. When times are good, rural people eat rice, beans, sorghum, and milo that the women typically cook in pits heated by burning charcoal. However, when the cost of imported food doubles in just two months as it did in 2008, Haitians either go hungry or resort to "mud cakes." These "cakes," made of clay, salt and shortening, are formed into gray disks about the size of a man's hand. Not only are these cakes nutrient deficient and unappetizing, but they also cost money, something which Haitians have very little of. The idea of having gourdes, the basic Haitian currency, is almost inconceivable in some rural areas.

Statistics say Haiti is progressing, though we may not be able to see it. Changes in any country must be gradual. We cannot expect instant gratification for our efforts there.

To put a stop to soil erosion in Haiti, all deforestation must come to a halt and reforestation must begin. Most reforestation projects in Haiti have little to show for their work. The rate of deforestation has simply outpaced that of reforestation. The World Food Programme provided food to Haitians who "earned" it by working: terracing hillsides, building infrastructure, and rehabilitating the land. I think this concept could be used very effectively, not only to repair the environment, but also as a learning experience. With funding from developed nations, the UN, and private organizations and individuals, Haitians could be organized, given specific jobs, and located to critical areas, with the end result being the restoration of trees and other vegetation and the building of terraces to prevent future erosion.

Through such programs, Haitians would learn the importance of protecting their habitat and that more vegetation and barriers equal less soil erosion. The erosion of soil is only part of the problem. Another goal must be to enrich the soil and make it more productive. Without the trees above, the rain would wash the soil away, and what was left would be baked hard by the sun.

Options for sustainable forestry are harvesting mature trees that can promote the growth of younger trees and preserve forest ecosystem, including the soil. This way we can protect the soil and make the trees themselves renewable resources.

Also, terracing is one of the oldest means of saving soil and water. Tilling and planting across the slope, following the contour of the land, as opposed to farming up and down hills. Farming on the contour creates small ridges that slow runoff water, and it increases the rate of water infiltration, reduces the hazard of erosion, and redirects runoff from a path directly downslope to a path around the hillslope.

Farming on the contour rather than up and down the slope reduces fuel consumption and is easier on equipment.

Crop rotation is another method of maintaining rich soil. Growing a variety of crops on the same piece of land is not as draining on the soil's nutrients as is monoculture. Growing the same crop year after year also increases the risk of disease, weed, and insect problems. Rotation of monocultures disrupts pests, helps recycle nutrients, and adds nitrogen if legumes are used. Monoculture shifts soil biology, and benefits yields of all the crops in the rotation.

In addition to educating Haiti's farmers on the above techniques, my proposal to address food scarcity and soil infertility in Haiti is compost education in schools. Composting is nature's way of recycling. It is a controlled decomposition of organic materials such as leaves, grass clippings, and vegetable and fruit scraps. Composting helps keep the high volume of organic material out of the landfills as waste and can be used to enrich soil. Compost can also be used as a moisture holding mulch and a that adds nutrients to the soil. My assertion is that in schools we teach kids the different composting techniques. They will practice this skill at home and at schools. In doing this they can gradually strengthen the soil from community to community.

Mulch is a blanket, an organic material applied to bare soil around plants. Effective mulches include shredded hardwood bark, pine needles, coarse compost, and shredded native tree trimmings. Mulching helps hold moisture in the soil, controls weeds and buffers soil temperature. It also protects and stimulates microbes and enriches the soil with nutrients as it decomposes. Also, Covering the bare areas with mulch or straw is an effective method for preventing erosion from wind and rain. Mulch and straw spread over the surface of the soil reduce the impact of raindrops striking the soil and cover it from the wind. Soil that is exposed to high winds may require a heavy form of mulch made from rock to prevent it from shifting in the wind.

Practicing these skills of composting and mulching provide a solution to an issue of great concern in many communities. All around the country, landfills are filling up, garbage incineration is becoming increasingly unpopular, and other waste disposal options are becoming ever harder to find. Composting provides a way not only of reducing the amount of waste that needs to be disposed of, but also of converting it into a product that is useful for gardening, landscaping, or house plants. By addressing the solid waste issue, composting provides a way of instilling in children a sense of environmental stewardship. Many educational programs focus on reducing, reusing, and recycling our solid wastes. Composting fits in with this idea but takes it a step beyond.

Contrary to the "out of sight, out of mind" philosophy, children who compost become aware of organic wastes as potential resources rather than just as something "gross" to be thrown away and forgotten. They learn through direct experience that they personally can make a difference and have a positive effect on the environment.

With richer soil, yields of coffee beans, mangoes, cassava, maize, rice, and other crops grown would all increase and could be used to feed the hungry nation. Not only must we enrich the soil of Haiti, but it

must be kept in a fertile state. These practices would make farming in Haiti more productive and improve food security.

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