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Guatemala: Factor 5

Guatemala: Responding to Climate Change by Adapting Practices and Policies

Guatemala is a land of contradictions; picturesque, lush, rolling hills, next to abrupt jagged volcanic mountain chains that bisect the country east to west, next to tropical lowlands. Guatemala's land mass, although comparable to the state of Tennessee, has coastlines on both the Atlantic Ocean and the Caribbean that measures over 400 kilometers. Although the climate is hot and humid along these coasts, the highlands to the north are arid and temperate and the mountainous areas experience freezing cold. Inhabited by an agrarian population with more than half living in rural areas, still many may not have enough food at the end of harvest to feed their families until the next growing season.

Although much of the country of Guatemala appears to be lush and fertile, crop failures are nothing new to the residents for a variety of reasons. In recent years, this country has pushed through volcanic eruptions, tropical storms, and sinkholes that can swallow whole buildings. This string of natural disasters has left parts of this nation stripped and inadequate for farming and raising sustainable amounts of crops. These factors have had a detrimental effect on Guatemala's ability to sustain important aspects of national success including education and healthcare.

In this paper, I will first present problems Guatemala has confronted, both natural and man-made, and then I will present how these issues can be dealt with. Weather patterns and climate change has taken its toll in the last 20 years in the areas in and around Guatemala. Because of its geographical location, the land is in both earthquake and hurricane zones of risk. A recent disaster in Guatemala was the eruption of the Pacaya volcano. This volcano left one person dead and over 2,000 citizens evacuated. Shortly after this eruption, Hurricane Agatha arrived on the shores of Guatemala in May of 2010. Hurricane Agatha tore through Central America; leaving villages destroyed, people dead, and the livelihood of most families, their crops, ruined. According to meteorologists in Guatemala, over 14 inches of precipitation had fallen by May 29; less than 5 days after the eruption of Pacaya. Landslides caused by the rain blocked roadways and destroyed fields and crops. The rainfall from Agatha also resulted in a sinkhole that measured over 100 feet in diameter.

Subsequent to these disasters, a mudslide tore down the side of the Agua Volcano leaving nine natives dead and twelve people missing. Guatemalan officials declared a state of emergency as conditions worsened. Multiple rivers were swollen and nearing the top of their banks. Hundreds of homes were destroyed leaving ranges of blank farmland, and the crops and promise of success for the year of hard work and faith was gone as if planting had never even taken place. These storms have set farmers and workers back for more than a year in their progress. As a result, the farming families had no means of income leading to an even higher poverty rate and making it difficult if not impossible for families to have proper nutrition.

Although these disasters took place nearly 3 years ago, the current status of Guatemala's climate is still unstable. The usual summer rains now occurr in the winter months and the summer brings drought-like conditions. A Guatemalan native, Marta Domingo, is quoted, "The climate has changed. For the last two years we have lost 30% of our maize and been forced to buy from the market just when prices were so high. We are surrounded by big plantations of palm, sugar and banana, and they have deforested and diverted the rivers. My grandparents used to say the birds sing to bring the rain, but there aren't many birds any more." Marta, along with many other Guatemalan parents, is struggling to keep food in the mouths of her 6 children.

As of the year 2000, Guatemala had a population of more that 12 million people making it the second most densely populated nation in South and Central America. In recent years, Guatemala has had an extremely high rate of population growth. The average Guatemalan woman has 5 children in her lifetime. Because of the size of the families, the average family lives off of a main diet of corn, beans, and rice; supplemented by cucumbers, melon, papaya, carrots, radishes, and other locally grown fruits and vegetables. With such a limited diet, many citizens are malnourished and are lacking many minerals like vitamin B12 and Zinc. This has resulted in a high mortality rate and a high incidence of fatal illnesses such as tuberculosis, heart disease, intestinal parasites, and influenza; conditions that need healthcare.

Health care in Guatemala is limited. It is divided into three sections: public, private non-profit, and private for-profit. Health care coverage is low, with an average of only 40% of the population receiving benefits. When comparing Guatemala's healthcare to the healthcare of the United States, there is a large gap. The U.S. has less than 19% of the population uninsured. Currently, there is less than one doctor for every 1,000 people and only .6 beds for every 1,000 citizens. These are dangerous ratios for patients. (Source: "Guatemala")

The education system in Guatemala is similar to the system in the United States. There is a 3-tier system that is compromised of primary education that is fully funded by the government, is obligatory, and lasts six years. Secondary school and technical school/college follows the primary curriculum in a progressive, globalized program. The main effort of these schools is to focus on multicultural affairs. Unfortunately, due to over 50% of the population being under the poverty line, many schools are under-funded. There is a lack of materials, classroom space, and currency. As a result of this lack of funding by both the population and government, Guatemala has an illiteracy rate of 31.9%. Many young students don't experience more than 4 years of education.

Just a little over 5% of Guatemala's total land is used for intensive crop production year after year, and the farms in Guatemala vary in size. Whether it is steep hills, rocky ground, or flat coastal plains, farmers are intent on cultivating, planting, irrigating, and harvesting from as much land as possible. The average farmer has to rent land to farm and although they put in long hours, they may still not have enough money at the end of the harvest to support their families.

Farmers grow a wide variety of crops. The most common cash crops are cotton, bananas, sugar, and coffee. Other crops that are also farmed and exported are hemp and cacao. The farming of nontraditional crops has grown in popularity in the last ten years. Examples of crops that are nontraditional crops are melons, papaya, mangos, snow peas, broccoli, celery, asparagus, and garlic. In addition to crops, farmers also raise chickens, goats, sheep, hogs, and cattle. Cash exports of agricultural crops in 2002 (source: Sagastume, Elizabeth) totaled nearly 1.5 billion dollars a year. In addition to the agricultural exports in Guatemala, there are also some natural resources exported such as petroleum, nickel, rare woods, and fish. Even with this huge amount of commercial agricultural production, daily food for families is not readily available and must be purchased in outdoor markets (similar to farmer's markets) or is bartered for with neighbors and other locals.

Major problems in the agricultural trade are trade barriers and tariffs. Countries willing to trade with Guatemala have been limited in the recent years. The United States is Guatemala's main trade partner and account for receiving nearly 38% of its exports and over 40% of imports. Another issue is the market's access to finances. Guatemala is not a wealthy country and this affects their trade and imports. The financial standing of Guatemala is also an obstacle to employment for the population, resulting in most citizens earning a wage that is not enough to sustain themselves. A path around the barrier of poverty could be an increase of non-agricultural employment. If this were to happen, there would also have to be a rise of agricultural diversity and productivity to keep agricultural production for exports high.

The conditions the average Guatemalan has to work in are often undesirable and in violation of most employment laws. The average minimum daily wages for workers are as followed (equivalents to the U.S. dollar are shown): $3.00 for the workers, $3.30 for the average commerce worker, $3.38 for construction workers, and $6.00 for special labor workers. For day-workers, the average workweek is 44 hours and 36 hours for night-shifters. Work conditions in Guatemala are often illegal and dangerous. Even when working in these poor conditions, the common worker still doesn't make enough to purchase basic necessities for their families.

Let's talk about how these monumental problems might be dealt with. If the nation of Guatemala had a more temperate climate with less natural disasters and milder summers, farming would become easier for agriculturists and the benefits reaped by the end of harvest would be lucrative and sustaining. Therefore, families would have more capital and there would be less of the population living in poverty. If the climate was more dependable and there was more harvest at the end of each season, economic development would boom and show great means of increase in just less than ten years. However, climate is a given and its results must be dealt with rather than controlled.

Even if Guatemala had a more temperate climate there would still be issues that would affect the productivity and sustainability of agriculture, Examples include water management and the management and conservation of natural resources. With the prospect of its population doubling every 23 years; sustainability of its resources such as water is important. This nation has water pollution as an additional matter of concern. Water pollution in Guatemala is a problem that is very dependent on population, management, and sanitation practices. Clean or potable water is extremely important for Guatemala even though 74% of the water in this nation is used by the agricultural industry.

In regards to the management and conservation of nature, deforestation due to clearing for agricultural use needs to be monitored to limit erosion. Rivers can be managed in order to maximize its usefulness for irrigation and everyday purposes. At this point in time, Guatemala has a program called The Program for Forest Incentives (PINFOR). This program has been created by the National Forest Institute to promote the idea of sustainable forest management through investments for reforestation activities and the management and protection of the natural forests. This program has made over 150,000 new jobs for the citizens of rural Guatemala.

Throughout the last 10 years, there has been much progress in innovative technology and farming practices to help smallholder farms ensure their agricultural efficiency. One practice that would be beneficial if carried out would be the use of better soil drainage systems. This would be especially useful because of the changing weather patterns and surplus of winter rain. Excess water could be controlled, impounded, and kept off of fertile crop growing areas.

Another system that would be highly beneficial in this country would be farm crop and property insurance. Risk management systems to protect corn and other crops against drought risks were first introduced in Guatemala in 1998. However, after Hurricane Mitch in 1998, problems with the system started to arise. These problems led to a more comprehensive project referred to as 'Guateinviete'. This project subsidized up to 70% premiums in accordance to crop size and type as well as location of the property that is being farmed. Guateinviete is a fund that guarantees credit from banks to the agriculture sector. As part of this guarantee, banks involved are required to request agricultural insurance coverage for farmers who borrow from the system. If the farmer doesn't request this insurance before the need for it arises, the subsidy is not accessible. A main barrier to this insurance system right now is raising enough capital to help subsidize the program. A more dependable system is needed for the country of Guatemala because of its unpredictable weather patterns.

Guatemala, as previously stated, has a lot of problems with poor nutrition, disease, and overpopulation. There are straightforward as well as continuous solutions to these issues. Lack of proper nutrition in families is often caused by the lack of variation in diet as well as the overall lack of vitamins and minerals. Two important minerals that are missing in the average Guatemalan's diet are Vitamin B12 and Zinc. Vitamin B12 supports proper brain and nervous function as well as maintaining blood production in the body. Zinc, the mineral, is a necessity for proper immune response and brain function. To more of these minerals, diets need to include more fresh fruit, seed foods, and meat. Increased meat production may not be a realistic solution due to climate, space, and productivity. However, these vitamins and many others are abundant in many crops that are adapted to the region if they would just be grown.

Since the average citizen in Guatemala has a compromised immune system from lack of proper nutrition, they are more prone to potentially fatal diseases like tuberculosis and influenza. These diseases do not seem serious or hopeless to those of us that are fortunate enough to live in a country with a strong healthcare system, vaccines, and modern medicine. For most Guatemalan citizens, their reality is dangerous and disease riddled. These disease problems are caused by crowded living conditions caused by overpopulation, lack of sound sanitation practices, and the lack of education to prevent them. Water sanitation practices such as the boiling of drinking water or using a reverse osmosis system to purify water before consumption is needed. Reverse osmosis is a process that is has been successfully to recycle wastewater.

Aside from the water sanitation issues, there is, as mentioned, the lack of health education. An aggressive education program needs to be added to the current primary and secondary education program that introduces the ideas of a stronger knowledge of disease control and prevention, as well as sanitation and hygiene practices at an early age.

The proposed water sanitation practices, boiled drinking water and reverse osmosis, hold singular benefits and drawbacks. Reverse osmosis of water is expensive as well as having health disadvantages such as de-mineralized water, acidic water, and not removing volatile organic chemicals. However, the largest advantage includes the elimination of arsenic, nitrates, sodium, copper and lead, and the municipal additive fluoride commonly found in water in Guatemala. Boiled water has advantages including eliminating pathogens as well as volatile organic chemicals. However, boiling water is not a suitable solution when nitrates, chemicals, or toxins are presented in the water. Another drawback of boiled water is the amount of energy (fuel) needed to carry out the boiling process. When promoting reverse osmosis and the boiling of water, it is important to reflect on what aspects of technology would need to be considered as well as how these processes should be promoted. Technology and equipment that would be needed for large scale reverse osmosis systems would consist of the meshes and screens as well as necessary pipes to carry out the procedure.

Agriculture has long struggled with irrigation and water management in crop production and its effects on the land it is enhancing. Agriculturalists, smallholders and plantation owners must use more efficient practices along with irrigation such as terracing, waterways, and no-till farming. Terracing is a practice that assists in drainage; this would help the fields accommodate the drastic differences between the swelling rains of winter and the fierce droughts of the sweltering summers. Waterways would be helpful in the winter with the large amounts of rain and these natural waterways would also be good for the wildlife as a habitat. No-till cultivation, also referred to zero tillage, is the direct planting of crops from year to year without tilling or disturbing the soil. This method of farming increases the organic matter, nutrients, and water in the soil as well as decreasing erosion issues.

In order for these suggestions to be successful and help Guatemala and its population, they would need assistance from the government, agricultural business corporations, and other organizations, as well as the enthusiasm of the general population. The government could be a partner in this effort by providing funds

to help implement these new plans. Barriers to improved farming practices include cost, education, and labor. Cost barriers are obvious yet unavoidable. The average rural worker, making an equivalent of three American dollars an hour, is not in a position to scale up already failing farming practices. Labor is another limiting factor that ties in with capital. A financial commitment by the government to implement and better education of improved farming practices may be necessary.

Education about progressive and sustainable farming practices goes further than what the government can subsidize. A grassroots movement, such as Campesino a Campesino, could greatly benefit all Guatemalan farmers. Campesino a Campesino means farmer to farmer. This type of movement is a highly effective communication movement between farmers. Farmers speak with each other through the use of parables, stories, and humor; presenting agricultural improvement as a logical outcome of clear thinking and compassion. Emphasizing a love of farming, nature, family, and community rather than forcing farmers to accept these new innovations, the program promotes the use of progressive farming practices such as terracing and no-till farming on a small scale to first see how they work. The government could assist in the development of this movement by funding conferences for rural farmers and workers to speak with each other and discuss successful farming practices similar to the successful Cooperative Extension system used in the U.S. An important offshoot of the Extension system in the U.S. is the youth 4-H program. This program along with other programs like the FFA organization would be an effective way to get young people involved in the improvement process and teach leadership, personal growth, and promote career success.

Guatemala, currently is just managing with the resources it has. However, it is a nation of great potential. If improvements can be made in critical areas, the country could ensure a bright future for its current population and for generations to come. Agriculturally, the management of limited agricultural land expansions, improved land drainage, managed irrigation, and revenue assurance through crop insurance could all be beneficial in the development of Guatemala. With an improved education system, sound sanitation and water systems, and an integrated health system, Guatemala has the potential to be an independently successful and sustainable country linking them to other countries of great influence.

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