

Natural Resource Degradation in Guatemala: Rising From the Ruins
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Guatemala is a study in contrasts. With a pleasant climate, diverse landscape, and Mayan ruins, Guatemala is a beautiful country, rich in culture, history and scenery including mountains and rain forests. Yet within the country, perhaps because of the rich culture and history, lies a civilization plagued with poverty, isolation, inequality, malnutrition and serious food security issues.

During the first millennium A.D., the Mayan civilization prospered in Guatemala. For nearly 2000 years, prior to the arrival of the Spanish in the 16th century, the country flourished with little outside influence. In the 900s, as the Mayan Empire reached its peak, the forests were experiencing the affects of extensive farming and settlement building. The fall of the Mayan empire coincided with major drought and the depletion of the forests as inhabitants either succumbed to famine or abandoned the region. Beginning in the mid-1500s, the country existed as a Spanish colony and Mexican Empire for nearly 300 years, before winning independence in 1821. Since becoming fully independent, the country has alternated periods of democratic rule with periods of civil war and military juntas. In 1996, after a 36 year civil war, Guatemala reestablished a representative government.

Today, Guatemala is a country rich with potential. Leaving behind a turbulent past, Guatemalan's recognize progress toward national stability that has not been perceived for over one hundred years. The Guatemala of today is a popular tourist destination, and it continues to draw attention from investors who see prospects for increased manufacturing and services.

On the flip side, internal problems of renewed overpopulation and repression, and the byproducts of these issues, remain significant obstacles for the country. Disparity among ethnic groups obstructs resolving the problems of Guatemala. The population is primarily divided between two main ethnic groups—Ladinos and Maya. Ladinos are those of Hispanic-Maya origin and make up most of the urban population. They are commercially and politically influential. Mayans make up the majority of the rural population and face a higher incidence of poverty. The relationship between the degradation of natural resources, including deforestation, soil erosion and water pollution, can be directly linked to the overpopulation, lack of opportunities, and other economic and social obstacles that are incurred by some Guatemalans.

Guatemala, population thirteen million, is the second most densely populated country in South America with an average of 1,253 persons per square mile. The total area of Guatemala is 42,012.7 square miles (including 668 square miles of water), slightly smaller than the state of Tennessee.

The rate of population growth is approximately 2.9 percent per year. The average family size is 5.3 persons. Unlike other countries in South America, the concentration of population in Guatemala occurs largely in rural areas with only 39 percent of Guatemalans living in urban areas. While 56 percent of the population is of Mayan descent, Spanish is the official language of Guatemala. People of Mayan descent are considered indigenous and the percent of indigenous population exceeds that of other countries.

More than sixty percent of Guatemalans are functionally illiterate and another ten percent read only simple words. Among the indigenous population, obtaining an education is exclusive. One in ten children who begin school continue past the third grade. More than two million school children are not receiving formal education of any kind.

A leading contributor to the lack of investment in education is the government. Minimal amounts are spent on educational materials and teacher pay is inconsistent. Some schools lack basic structural elements such as windows, ceilings, or walls. Access to books is limited. Schools lack textbooks, especially the schools in rural areas with a greater percentage of indigenous children. There are few libraries and existing libraries have limited materials.

Because parents cannot afford the cost of tuition and books, children of Mayan descent tend to enroll in school at an older age and drop out in earlier grades. Also contributing to the dropout rate is the need for supplemental family income. One of every five children between the ages of seven and fourteen works at least thirty hours per week. These educational barriers contribute to the poverty, especially in rural, densely populated areas of Guatemala.

Poor, rural individuals contribute to 71 percent of Guatemala's population. About fifty percent of the Guatemalan children under the age of five are chronically malnourished and sixteen percent suffer from low birth weight. Corn and corn products are a major portion of the diet with 46 percent of calories consumed coming from this low-cost source. The poorest people are the indigenous who are typically excluded from access to roads, markets, education and politics. Seventy-five percent of the total population lives below the poverty line with 58 percent living in extreme poverty on less than \$2 per day. Lack of food is frequently cited as a major problem in the country as well as access to health care and sanitation. An extremely low percent of the population, somewhere around 54 percent, has access to potable water service, with only 49 percent accessibility to sanitation services. Chronic malnutrition targets children and facilitate high infant mortality and the spread of disease.

While agriculture is the largest source of work, the urban areas of Guatemala provide more opportunities. Efforts to increase manufacturing include growth in the apparel industry. The service industry accounts for the largest segment of the country's gross domestic product and employs about 37 percent of the nation's total workforce. The service sector includes retail, transportation, financial services and tourism.

While the minority of the population lives in the urban areas where there is access to employment, education, financial services, healthcare and sanitation, the majority isolated rural population struggles with a long history of social and economic discrimination. There is inequality of land distribution with 96 percent of producers farming twenty percent of the land mass while living in subsistent conditions.

Guatemala's soil and climate are considered ideal for crops such as coffee, sugar, bananas, cocoa, tobacco, and of course corn, which makes up a substantial portion of the Guatemalan diet. Bananas are one of Guatemala's largest agricultural exports. Guatemala is the third largest exporter of coffee, and it is the most profitable agricultural export with sugar as the next leading export. Guatemala is also the only oil producing country in Central America.

Rapid population increases lead to increased deforestation, soil erosion and water pollution. All three environmental concerns threatened the living conditions of a country with a high percentage of people already living in impoverished and disadvantaged conditions.

Deforestation, the country's most serious natural resource threat, is occurring at an alarming rate. Estimates are that the loss of 150,000 to 220,000 acres per year will result in the loss of almost all primary forest areas by the year 2020. Commercial and private sectors of the economy contribute to deforestation. The demand for firewood is a primary culprit with 75 percent of households using wood for fuel. Rural areas do not have access or the means to pay for alternative sources of fuel. Cultural differences accelerate the problem. For centuries a "slash and burn" mentality, the use of trees and

water, has been taught and embeds the culture. As the population continues to grow, the increased need for agricultural land to support the inhabitants and settlements affects deforestation.

Soil erosion due to large scale clearing of land causes irreversible declines in land productivity. To prepare fields for planting, a common yearly farming practice is to burn brush. In a rainy year, this practice, forfeits soil loss of 35 tons per acre.

Deterioration of the watershed from population demands, sedimentation, run-off from large scale cattle operations, irresponsible dumping of sewage and industrial waste, and pesticide mismanagement threaten the health and agricultural productivity of Guatemala. Run off from polluted water sources contaminate farm fields and family gardens as well as the drinking water supply resulting in both disease and lower production.

The elements of natural resources degradations are intertwined. Removing trees and vegetations creates increased soil erosion and run-off which increases the sedimentation of streams and degrades the water quality. Additionally, deforestation has been linked to changes in rainfall patterns and climate changes.

While no one strategy will solve the problem of natural resource degradation in Guatemala, there are several strategies that if implemented can significantly slow the destruction. Because deforestation, soil erosion and water pollution are linked, improvements made to one resource can positively affect the other elements. Besides taking actions to directly stop natural resources degradation, creating new non-farm opportunities will benefit the environment.

Primarily, efforts should be made to improve the per acre productivity on farmland. Enhanced farming practices can increase the yield thus requiring less acres of land to produce the same amount of product. Examples include use of green manures, responsible use of herbicides and chemical fertilizers, and access to newer machinery.

Since acre crops are needed to produce the necessary family income, planting more profitable crops is also a way to reduce the strain on the land. Assistance needs to be provided to farmers to enter profitable "niche" markets such as organic crops. This assistance should be in the form of agricultural education, financial aid, help in marketing produce, and expertise in negotiating contracts.

Expansion of intercropping, in which one crops grows between the rows of another, allows an efficient use of land. Cassava (yuca, a significant source of carbohydrates in the world) can be grown with corn or tobacco. When two crops with different rooting patterns and water and nutrient demands are planted together, the resulting combined yield can be higher than if the crop was grown as a stand-alone crop.

The technique of agroforestry, which involves planting trees in rows against the slope of the land leaving room for crops to be grown in between rows of trees, has been introduced in Guatemala. Expansion of this practice would reduce soil erosion. This practice is particularly effective for leguminous plants which enrich the soil by infusing nitrogen back into the soil.

The common land preparation practice of burning brush before planting crops, has been identified as a destructive contributor to soil erosion. Farming practices that reduce soil erosion by roughly 98 percent include employing alternative soil preparation, plowing practices, and the use of slow formation terraces across the contours of the slopes. Education and investment by the Guatemalan government to help spread these practices are keys to getting a handle on the extensive problem.

Although a considerable expense, Guatemala needs to look toward funding other sources of fuel to rural areas. The “slash and burn” mentality that has been prevalent for hundreds of years, no longer is a practical option. Guatemalans must consider the environment and the long term impact of their actions.

Guatemala, with eighteen major rivers and adequate amounts of rainfall on average, has an abundance of water. Proper management and regulation of the water supply is needed to insure the security and stability of this resource. A comprehensive watershed plan along with the implementation of stringent regulations protecting the water supply must be enacted to prevent untreated waste from entering the waterways.

In addition to the improvement of agriculture practices, there are social, political and economic changes that could reduce the strain on natural resources and the food supply in Guatemala. There is a strong correlation between the high incidence of poverty and the isolation of the rural population.

Roadblocks to slowing the progression of natural resource degradation include communication barriers, lack of education and literacy, cultural differences, lack of trust between social classes and lack of political representation by the poor. Also the high rate of poverty makes it impossible for most farmers to invest in equipment or risk results of unfamiliar farming practices.

The current availability of land for agricultural careers cannot sustain the expected growth in population. Improving education will open the door for other careers not directly dependent on agriculture and less straining on the land. Efforts to improve communication with the indigenous population and provide representation to the rural poor would help increase access to basic services as well as economic opportunities. For farmers forced to seek employment in non-agricultural occupations, providing technical assistance for the establishment of entrepreneurial businesses, job training, and developing temporary welfare programs would facilitate the transition.

To remedy the inequality in land distribution and exploitation of subsistence farmers, Guatemalan leaders need to take action. The success of any plan for long-term economic advancement depends on the equal treatment of the citizens. Government funded land grant programs and access to financial services are starts to resolving long standing inequity.

By providing access to better education, financial and capital resources and political representation, the rural poor could seek employment in non-agricultural fields. The densely populated areas could experience relief as indigenous citizens integrate into urban areas. As the population becomes more integrated, the social isolation and discrimination eases, and the disadvantaged sectors begin to assert their rights to achieve a level of equality.

While Guatemala may be one of the poorest countries in Central South America and it may have many huge obstacles to prosperity for all inhabitants, it is also one of the richest in terms of natural resources, culture, history and potential for growth. In order to succeed and protect the natural resources that are so vital to the future, the country will have to invest in the land and the people.

Among countries that face significant poverty, Guatemala is fortunate to have many assets and such potential for achievable solutions. The abundance of natural resources and a culture of survival and rebuilding make this country uniquely qualified to rebuild and strengthen the natural resources lost due to centuries of careless development.

Since the end of the civil war in 1996, Guatemala has addressed many of the country’s issues. It is important to keep in mind that in terms of recovery, Guatemala is in the infancy stage. Post-conflict Guatemala shows signs of great promise as a tourist destination largely because of the natural resources

that are now threatened by the long standing practices of the past. The opportunities presented by the peaceful Guatemala create new opportunities that will preserve and protect the natural resources of this beautiful and rich country.

Solutions to the problems facing Guatemala will include programs that protect the environment, educate all people, provide incomes, promote different cultures and societal classes and open doors for future generations.

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