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Improving Food Security in Togo: Adapting Farming after Natural Resource Degradation

Introduction

Togo is a small agricultural nation in West Africa, and it is located between Ghana to the west, Benin to the east, and Burkina Faso to the north. Southern and Northern Togo are very different. Southern Togo has many lagoons and contains low and narrow coastal strips of land. Northern Togo is made up of sedimentary lands with higher elevations, and the highest elevation is in the northeast part of the country. Part of the country has a plateau region that lies just north of a chain of hills that reach from the southeast to the northwest side of Togo.

Almost 65% of the six million inhabitants of Togo are farmers, or are employed in agricultural related jobs. Natural resource degradation has occurred due to use of wood for fuel, and increased demands on the natural resources by the growing population. Family farmers are subsistence farmers who rely on their crops to feed themselves. Togo's rural population is poor and 32% live below the poverty line. Water and air pollution also contribute to the degradation of the resources. Of Togo's 56,785 sq km (21,925 sq miles) of land, only 70 sq km (27 sq miles) is irrigated.

Traditional farming practices in Togo cannot keep pace with the needs of their growing population combined with the human caused natural resource degradation. Improving food security in Togo will be directly related to finding new and sustainable farming practices to improve yields and reduce the environmental impact. Ways to adapt farming for the subsistence farmer must be explored.

Only 68 miles wide from East to West, Togo has six different climate zones. It has beaches, jungles, and a large variety of land with rivers that drain from both the northern and southern parts of the country. The climate can range from tropical to savannah, and comparatively, Togo is slightly smaller than West Virginia in the United States. The temperature ranges from 27° Centigrade (80.6° Fahrenheit) in the south and 30° Centigrade (86° Fahrenheit) in the north. There are two rainy seasons, from April to July, and October to November in the south. There is one rainy season in the north, from April to July. The average rainfall is 1,321 mm (52 inches) and 1,143 mm (45 inches) respectively.

Wild animals are rare, especially in the southern and central regions. A few lions, leopards, and elephants can be seen in the north. Monkeys, snakes, and lizards are numerous in many areas, and crocodiles and hippopotamuses are found in the rivers. Many different species of birds and insects are found in the country. Fish caught off the coast include mackerel, bass, seabream, red snapper, triggerfish, dorado, ray, sole, and white crustaceans.

Typical Subsistence Family Farm

The average farm size is less than seven acres and most families are subsistence farmers. Peanuts, millet, and sorghum are grown in the north; sorghum, yams, corn and cotton in the central region; coffee, cocoa, rice, and cotton in the south. The overwhelming majority of the crops being raised are eaten in the home, particularly rice and corn. Extended families living together are common, with three or four generations living together with a yearly income of only 350 United States dollars.

A family in Togo may be a part of one of 37 different tribes and their religious beliefs could be Christian (29%), Muslim (20%) or other indigenous beliefs (51%). French is the official language in the country; however one of the other four African languages of Ewe, Mina, Kabye, or Dagomba may also be spoken in the home.

Raising cotton used to be a more stable source of income for Togo farmers. However, years of not being reimbursed for their cotton, low cotton prices, and poor weather caused farmers to change to other crops. In 2007, the Togo government committed to repay farmers for their past cotton crops and cotton farming is starting to reemerge as a viable option for farmers again. Certain cereals such as wheat cannot be grown in Togo and must be imported. Leading cash crops are coffee and cocoa, followed by cotton and peanuts. Some attempts are being made to export pineapples, houseplants, vegetables, and palm oil by the Togolese government.

Education and life expectancy in Togo impact the family farm and can be considered major barriers. The average life expectancy in Togo is 55 years old for females and 51 years old for males. Four percent of Togo's population lives with HIV/AIDS and many families live with that or other infectious diseases such as hepatitis A or typhoid fever. Children are generally sent to school until the age of eleven for males and seven for females and the literacy rate for reading over the age of 15 is 60%. The difficulty of getting to school is another obstacle; some students must walk 10 miles to the nearest school.

Factors Impacting Agricultural Productivity and Farm Income

The high rate of population growth is taking a toll on the natural resources of the country. The need for firewood has been one of the primary causes of deforestation in Africa. Fire wood is used as fuel for electricity and heat in the bigger cities. The deforestation has caused desertification in the north, in spite of a government campaign of reforestation to halt the spread of the desert. Desertification is a process by which land becomes increasingly dry until almost no vegetation grows on it, making it a desert.

Togo once was forested, but the majority of the forests have been cut down and used for fuel. Only 9.4% of the country's land area is now forested and only 2% of that forest area is protected by management plans. The country is losing 21 hectare (51.9 acres) per year. That is over 3.4% of the total forested area per year.

Due to that fact, Togo now has to import wood from neighboring countries. Soil erosion is also occurring because of deforestation, and it is impacting agricultural production. A mountain chain runs down the center of Togo, and because of erosion, it has become harder to farm on the areas impacted by the run off. Some of the rivers in Togo have dried up and cut off some of Togo's farmers from their main water source. When the wind picks up, it lifts the indispensable resources off the ground and makes the land even less fertile. During rainy seasons, the heavy rain makes ruts and channels large. This impacts the farmers' land and makes it more difficult to farm. All of this is due to deforestation.

Many factors are causing people to deforest the land and these obstacles must be overcome in order to stop the deforestation industry. Any forests that are left in Togo are being cut down for energy because Togo cannot import fossil fuels due to their small economy. Also many political organizations are even promoting the use of timber for energy because of the backlash against fossil fuels in many other countries. Before any reforestation efforts can be undertaken, many public policies and opinions must be changed, and the source of fuel for energy must also be changed.

Farm income is impacted because fragile areas are deforested, over cultivated, and overgrazed. Trees and bushes are stripped away to clear more land for cultivation, or to provide firewood and timber. In the process, the plant cover that binds the soil is removed. Animals can eat away grasses and erode topsoil with their hooves. Intensive cultivation depletes the nutrients in the soil and poor irrigation practices can harm the land. Once soils have become fragile and plant cover has been lost, wind and water erosion make the damage worse. Topsoil is carried away and a mix of dust and sand is left, causing desertification. Farming becomes more difficult and productivity for the subsistence farmer declines.

All of the human induced degradation of natural resources has affected subsistence farmers. Water has been harder to find, and natural streams that farmers used to rely on are drying up. The soil becomes infertile and more difficult to farm. Fields also are requiring more and more cultivation and fertilizing to make them productive. Overuse of the soil also creates poor quality soil and these can lead to intensive cultivating and fertilizing to be productive. The cycle created impacts every part of the farmer's life. Families have to work harder to make an income to support their family, and the majority of subsistence farmers have little income or knowledge to positively impact change on their own. They cannot reforest their land, nor do most have the educational background to provide other options for their families.

Resource degradation has disadvantaged many developing countries, because they cannot keep up with the cost to fix the degradation. If they cannot fix the problem, then the agriculture that many people depend on for life will begin to fall apart and people will begin to starve because they cannot grow enough food. Subsistence farmers are impacted greatly.

Togo is the world's fourth largest producer of phosphates and is the main source of foreign exchange for the country. Although agriculture employs more of the population, the impact of mining phosphates, limestone and marble has impacted the degradation of the land. Poor mining practices combined with using potential agricultural land for mining impacts the family farmer by limiting available land.

If this problem were resolved, many subsistence farmers would become more productive, leading to a surplus food that the families could sell to make money, and create a better life style. More land could also become fertile and more able to farm, leading to bigger farms and a better and more stable income. By planting trees and other natural vegetation, natural degradation could be slowed down or even stopped. Of course, that would lead to less farmland at first, so crop yield would be decreased. Over time though, as the degradation is stopped, farmland would become more fertile thus leading to higher crop yield and more profits.

Forestry projects in many fairly developed countries in West Africa currently embrace concepts of management of renewable resources now. They use the participation of local people, and participation in these programs by developing countries has increased during the last few years but still needs to be improved. In Togo, many international programs are working with the government of Togo to train and assist the population in learning about reforestation and stopping degradation. However, the process is slow and trees take a long time to grow.

Adapting Farming to Improve Food Security

With continued education for the Togolese population and government, the importance of stopping deforestation and degradation will continue to be recognized, so the long term impact will be less devastating. This would have a major impact to subsistence farmers. Their land is already losing its fertility and the ability to grow healthy crops as well as in the past. Reforestation and stopping

degradation must continue, however, other options must be presented and considered for the subsistence farmer. The government of Togo must support any plans for them to be effective.

Global warming and other types of climate change must also be considered in any option to adapt farming and improving food security. Some crops may not be able to grow in the regions they used to grow in. It would be necessary to adapt subsistence farmers to climate change and how to grow other types of crops for a living. Education, government and farmers' commitments will all be necessary for a long term plan and solution to the problems.

There is no simple way to fix the problems or adapting farming or people to change. Replanting previously forested areas will be a necessary step to curb soil and resource degradation and climate change, but it will only work for the long term. Another short-term or intermediate solution must be found. That solution has to be cheap enough for small governments to afford, and it also has to be versatile and useable on a larger scale. Hydroponics farming may be the type of a solution that could positively impact change and bring food security to the subsistence farmer.

Hydroponics was first used on a large scale by the United States military during World War II on Wake Island. The soil there was infertile, and there was little of it. Hydroponics was used with great success there, and the plants grown were able to feed hundreds of soldiers stationed there. Hydroponics works differently than typical planting because the plants are grown in a liquid solution that provides all of the nutrients for the plants. For this type of hydroponics, no soil is required. Many forms of hydroponics have been used all over: from the cold, infertile Arctic to the International Space Station. Hydroponics has been used in a large scale at many growing facilities throughout the world.

Hydroponics are fairly inexpensive, by United States standards, to start. They are light since they require no soil, and they take up less room compared to traditional planting since the roots of the plants don't need to grow out as much to absorb all of the necessary nutrients. Systems can be started for 100 United States dollars, but once it is started, there is very low upkeep cost. Farming in this manner does take time and attention; however, extended families in Togo could be of assistance and farming in this way would be easy for all generations to learn. Hydroponics can be used on many types of plants with good results. The investment of money by a loan or grant to subsistence farmers could change their lives.

Farming in this manner can be a great way to grow large amounts of fruits or vegetables in a limited space. With some forms of hydroponics, all the farmer would need to do is get some water, add a bag of nutrients to it and then plant the seeds in a cup and submerge the cup in the liquid solution. The plants can then be grown in a green house out next to the house. The farm land could still be farmed on a smaller scale while reforestation could be going on and the fertility of the land restored.

One of the simplest homemade systems uses the following supplies: A 75 liter (20 gallon) plastic storage tote, channels of pvc pipe - four to six inches in diameter, a one half inch water line that is capped on one end, pots for plants, pvc glue and a submersible pump. With this simple system, a farmer could learn to make and adapt his system to his needs. It would be easy to maintain and build.

The money to educate farmers on how to use hydroponics and how to prevent resource degradation would need to come from the United Nations or some other form of international aid. Instead of sending volunteers to assist with only reading and writing, volunteers could be sent to teach hydroponic farming, setting up farms and loans for farmers. A strong foundation would need to be built with subsistence farmers and that support would have to be supplied initially by outside sources. The initial investment in Togo to make it more stable and adaptable would be at a cost, but then a payback deal could be worked out with the developing democratic government of Togo.

Conclusion

Human caused degradation is a growing concern in Togo. It needs to be stopped or the entire nation of Togo will soon be an infertile nation that is turning into a desert. If the land used for farming is allowed to continue to degrade, farmers will lose their only source of food and income. Food security is a concern for the small country and understanding the role of the subsistence farmer is important. The very economy of Togo would collapse considering that 65% of their population are farmers and that many more work in the agricultural industry.

Togo has a very diverse ecosystem encompassing six very different ecosystems, from desert to savanna to tropical rainforest. It may be a small elongated country, but it is one of the most diverse areas in the world. Not only is it a melting pot of many ecosystems, but it also is a melting pot of many different cultures; from French, to African, to many other native cultures. Due to all that diversity, Togo is a good indicator on what is happening in ecosystems around the world, and how it is impacting different cultures from many different regions.

Finding viable ways of stopping degradation in all six ecosystems within Togo must continue and be implemented. Stopping degradation, deforestation, desertification, and adapting to global climate change are all needed for food security in Togo. The same methods that are used in Togo could also be developed in other small developing countries.

All in all, many different forms of curbing and reversing degradation must be used in Togo and most of them will take some time. A mixture of short and long term solutions must be used in combination with each other to reach the desired outcome. A short term solution like hydroponics can be coupled with a long term solution like reforestation. With a little effort, hard work, and time, a desired outcome can be reached, and by learning how to reach that outcome in a country like Togo, humanity can work to get that conclusion throughout the world.

By increasing yield by subsistence farmers, food security can be attained and can be held for decades to come. The surplus food that could be grown by the farmers could be sold at the local markets for a profit. Not only would that improve the security of the farmers by putting extra money in their pockets, but it would also improve the food security of non-farmers by giving them a more secure and stable source of food. Depending on how much higher the yields are farmers could improve their annual income by quite a lot. Finally, if high enough yields were reached, there would be more of a supply and Togo could export more crops to the surrounding areas, improving the economy and the stability of the economy.

Many other organizations from outside of Togo would be needed to implement the procedure to improve food security and stop natural degradation. The World Bank may have to supply some money to the government and citizens of Togo in order to build the basis of hydroponics and reforestation. The United Nations could oversee the reforestation of Togo or even lend some people to help with the efforts. Some companies from around the world would have to build large amounts of the supplies to build hydroponic systems and maybe even sell these supplies for a lower cost. Many organizations from all over the world will have to come together to improve food security in Togo and other African countries, and hopefully it will have good results.

Works Cited

- Bonnal, Jean, comp. "Republic of Togo." The Online Sourcebook on Decentralization and Local Development. Food and Agriculture Organization of the United Nations. 12 Sept. 2008 <<http://www.ciesin.org/decentralization>>.
- J., Dan. "Hydroponic Plants Triumph in Unlikely Places." Hydroponics Dictionary. 8 May 2008. 13 Sept. 2008 <<http://hydroponicsdictionary.com>>.
- Kenney, Brad. "Success under Glass." American Vegetable Grower (2006): 12-13.
- "Local and National Consequences, Loss of Local Climate Regulation." Mongabay. 4 Sept. 2008 <<http://mongabay.com>>.
- "Obituary: Gnassingbe Eyadema." BBC News 5 Feb. 2005.
- "Projects Abroad in Togo." Volunteer Abroad. 12 Sept. 2008 <<http://www.volunteerabroad.com>>.
- "Republic of Togo." Nations Online. 12 Sept. 2008 <<http://www.nationsonline.org>>.
- "Rural poverty and desertification." Rural Poverty Portal. 14 Sept. 2007. International Fund for Agricultural Development. 10 Sept. 2008 <<http://www.ruralpovertyportal.org>>.
- Todzro, Mensah F. "Situation on desertification and degradation of natural resources in Africa." Cosmovisiones. 8 Sept. 2008 <<http://www.cosmovisiones.com>>.
- "Togo." Britannica Online Encyclopedia. Encyclopedia Britannica. 5 Sept. 2008 <<http://www.britannica.com>>.
- "Togo." Central Intelligence Agency. 4 Sept. 2008 <<http://www.cia.gov>>.
- "Togo." Encyclopedia of the Nations. 3 Sept. 2008 <<http://www.nationsencyclopedia.com>>.
- Turner, Steve. "The Hydroponic Farm: Simple and Profitable." Country Journal (1982).
- "West Africa." FAO Corporate Document Repository. Food and Agriculture Organization of the United Nations. 12 Sept. 2008 <<http://www.fao.org>>.
- Willkomm, Jason. "How to Make a Simple Homemade Aeroponics System." Hydroponics Dictionary. 8 May 2008. 13 Sept. 2008 <<http://hydroponicsdictionary.com>>.