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Belize: Erratic Weather and Climate Changes Effect on Food Security

Belize is a country of over 312,000 people located in Central America. Belize is comprised of total area 8867 square miles making it slightly larger than Massachusetts. (U.S. Department of State)

Belize is also referred to as one of the most scarcely populated countries in the Americas (Belize Family). Belize used to be known as the British Honduras until 1981 when they finally pursued and gained their independence after decades of being ruled over by Spanish and the British. Belize is now a member of Common Wealth of Nations (CWN). It is made up of lush rainforests, lowlands, Mayan mountain range (3675 ft. high) and home to the world's longest and second largest coral reef known as Belize Barrier Reef. Belize is located in Central America, south east of Mexico and directly east of Guatemala. Belize has a subtropical climate with an average moderate temperature of 80F and an average rainfall of 51inches in a year. Belize is comprised of 59 percent forest with deciduous trees in the north and tropical hardwoods dominating the south (About Belize). Belize has two major meteorological disturbances, northers and hurricanes both of these disturbances can cause changes in the general weather patterns with northers producing colder than normal temperatures and wide spread, heavy rain fall that are most often hard to predict or forecast. Hurricanes however are far more dangerous than northers, June1 sites the beginning of hurricane season in the Caribbean Sea, Gulf of Mexico and the Atlantic Ocean. Typically for Belize hurricanes occur during August to October (Extreme weather in Belize…Northers and hurricanes). Belize recently had hurricanes during 2007 and 2010 where there was heavy flooding causing major damage to agricultural exports. The damage was widespread and particularly devastating to the rural poor with destruction of crops needed to feed their families and surplus yields diminished or eliminated that could have been sold to gain precious income for the family. (U.S. Department of State)

The people of Belize are a very diverse in ethnicity and racial descents comprised of Native Americans, Europeans, Creole, Garifuna, and Mayan and of mixed decent. At approximately 15 persons per 30 square miles, Belize hosts the lowest population concentration in Central America. Its official language is English although its people speak different languages for example; Caribe, Mayan, Spanish, and even a Créole dialect. It is a Christian nation with more than 50 percent of the population being Roman Catholic and the majority of the rest protestant with a small percentage being Muslim, Hindu and Buddhist. Education in Belize is a premium in which they require children 5 to 14 years of age to attend school. At the primary level school attendance is moderately high at 90 percent, but then at secondary level that rate declines to an average of 38 percent enrollment. This decline is easy to understand given the fact that Belizean secondary students must pay for the continuance of education. Subsistence farm families find the cost prohibitive and the time, they believe, is better spent in the workforce supplementing the family's income. In spite of all of this, at 76.5 percent, Belize has claim to one of the highest literacy rates in all of Latin America (U.S. Department of State).

For Belize the typical rural farm family would consist of a mother, father and two to three children (Department for International Development). Education, as we know, 90 percent of the 5 to14 year olds will attend school while by the time they reach secondary school only 38 percent will have remained enrolled probably because of cost and loss of family income. In Belize we find that they have 1,594 miles of road of which only 303 are paved (Belize Infrastructure). The lack of proper road conditions has also negatively affected rural farm families with the added fact that there are only 10 cars for one thousand people in the entire nation of Belize. Lack of roads and poor conditions of those already existing roads makes it difficult for rural farm families to reach urban areas where they may sell or buy goods or obtain health care. The children of rural families are more likely to be under weight, wasted or stunted in growth compared

to the families that live in urban areas (Belize Multiple Indicator Cluster Survey). Rural farm family's annual income is $365 to $730 a year, whereas GNI (Gross National Income) per capita is $3740(Rural Poverty in Belize). Belize is made up of an agricultural work base which provides 71 percent of the foreign exchange and of which provides 29 percent of the approximate labor force employees. The mortality rate for men is 71 years compared to 76 years for women whereas infant mortality rate is 2.3 percent. Roughly one third of the nation is under the age of 14 years, and half is less than 24 years of age causing yet another factor in the reason teens do not attend secondary school. (U.S. Department of State)

In Belize breakfast is the main meal of the day. For the rural farm family their main diet would consist of rice and beans, meats such as fish, seafood and chicken, they may also enjoy some more exotic meats (game) like venison, armadillo, iguana and gibnut (paca) all of which are indigenous to Belize. Even though about 1,998,230 acres are suitable for agricultural use only 10 to 15 percent is farmed per year (U.S. Department of State). Vegetables are lacking in the rural family diet, the vegetables in Belize are hard to come by, the most commonly grown vegetables are cabbage, potato and beets. We know that some rural farm families have access to vegetables in school gardens and with participation are learning to grow more varieties (Plenty Belize). The fruits in Belize are in abundance the most common fruits are mangos, papayas, pineapples, melons, bananas and carambolas (star fruit). Most of the drinking water is rain water; they do this by collecting the rain that falls on the roof and storing in a cistern for future use. The ground water is generally unsafe in most of the rural areas due to poor and sometimes improper sanitation as well as the leaching of chemicals from farming or salt water leaching resulting from floodwaters after a hurricane. (U.S. Department of State)

The typical family sustenance farm is 10 to 49.9 acres. The crops most often grown are beans, rice and maize with some raising citrus fruits as well. The farmers practice the milpa system using a combination of perennial crops most often the farmers have little knowledge of technology or are unable to obtain it, resulting in low productivity and low crop yields. The end result is that most of the farmers will have to work somewhere else besides their own farm to be able to properly provide money for their families. The limited financial resources of these families often inhibit the adoption and implementation of cropping in a productive way (Rural Poverty in Belize).

Presently the rural farm family has access to health care but is not able to afford it. Currently Belizean organizations are partnering up with World Health Organization (WHO), Pan American Health Organization (PAHO), and the International Development Bank (IDB) and as well as various international aid organizations. They are working to reform Belizean health care to introduce the National Insurance Health scheme (NHI). This reform, when completed, promises to provide all Belizean citizens with free public health care access. At present time, though most rural families and especially poor families are unable to afford most healthcare. The youth are at greatest risk of malnutrition and food insecurity. The youth are at greatest risk of malnutrition and food insecurity. There are however some programs that provide free or relatively free care for the severely impoverished (Belize: Health Care System).

At this time, erratic weather and lack of support of ecological resilience are points of major concern. There direct result adversely affects crop yields in that the crops are either partially lost or totally destroyed. This directly affects the subsistence farm families in loss of producible food as well as surplus for added income supplementation. The most recent hurricane and resulting flood waters were in 2010. Belize's erratic weather is a common problem consisting of northers, flooding and hurricanes. The most natural result from the hurricane is a decline in agriculture yields. As of now the situation is that flooding waters have removed nutrients from the soil and caused wide spread soil erosion. This has continued to result in low yield of crops for the next season and so on. Because of the lack of technology among this subsistence farm family group the effects have become seemingly stagnant. The farmers are unable to employ techniques, either from cost or lack of knowledge, that would decrease or eliminate soil erosion

and nutrient depletion. The continued lack of financial resources for this group has continued to perpetuate the problem. We were able to compile these facts using the 2010 Census Summary of Belize.

Although, it is obvious that they cannot alter or eliminate weather patterns, climate changes or even control erratic weather such as a hurricane they can help to protect their food crops by preparing ahead of time. To do this they would have many options to help protect their food crops, for example, planting erosion preventing crops around their intended harvest or digging more ditches and trenches around their harvest crops. This type of prevention could help to alleviate some of the problem of not being able to produce a profitable and increasingly larger crop yield. The devastating destruction of a hurricane or northers could become virtually non-existent. This, in turn, could assist the rural farm family by allowing them to sell surplus goods at the market and earning much needed additional income. Increasing yield will directly affect their income and, in turn, will directly affect the family's food security. Besides the increase of crop yields the crop integrity and quality could be greatly improved by the use of anti-erosion techniques leading to greater food security.

There are a number of other factors that have the potential to negatively affect Belize people, two of which are economy and ecological systems. Global warming, although its viability is still under scrutiny, can potentially cause salt water intrusion into fresh water aquifers through coastal flooding and erosion. Increasing temperatures that can lead to heat stress, coral bleaching, loss of biodiversity and therefore an increase of the spread of disease, increased droughts and floods and even fresh water supplies are threatened as a result of the changing rain fall patterns. The increase in global warming is also believed to increase the intensity of hurricanes and tropical storms threatening the very lives of the people of Belize. One group that is trying to help with this problem is the Caribbean Community (CARICOM) at which one of their projects is Mainstreaming Adaptation to Climate Change or MACC. (The San Pedro Sun)

Urbanization of Belize can be both positive and negative for wellbeing of the typical subsistence farm family. The rate of urban population growth is currently 2.59percent and has been on a steady rate of increase for some time and bringing the total urban population growth to 52 percent. The rural population growth, however, continues to decline and is presently 1.37percent as of 2010. With the increase of population density other problems have begun to appear: increase in arable land with a direct decline in numbers of farms for one. So although the land is being cleared its purpose is not intended for permanent crops or subsistence farms but rather building sites, wind farms. (Belize). The rising urban population is also increasing the need for clean water. Currently in the rural areas clean water is a valuable commodity because of the lack of proper sanitation. Water scarcity for Belize is on the rise by 2025 they will need to increase their water development from 25 percent to 100percent. (Argonaut)

Increasing demands on energy have become a source of concern for both rural and urban dwellers of Belize. It is easy to believe that 10 diesel powered generators were not adequate for the country of Belize. 50 percent of their electricity is supplied through Mexico and another 30percent from the Mollejon dam. The remaining 20percent is furnished with thermal sources. The construction of a hydroelectric plant began in 2002 and despite law suits is operational with a plan for the private owners to transfer ownership to the Belize government. In 2000, only 17percent of Belize's energy consumption was from hydroelectric power and the other 83 percent from petroleum. (Encyclopedia of the Nations)

Based on the research I would recommend, for the erosion of food crops, to first educate the people about what to do before the bad storms come. I would recommend planting some anti-erosion plants around the intended harvest, to help the harvest stand up against the harsh weather and floods that can wash away plants and much needed soil nutrients. Another strategy would be to dig more ditches and trenches to catch the water and draw it away from the intended crops of harvest so that the fields are not flooded when the storms come. Lastly for agriculture I would recommend that we should introduce technology to farming practices, since the families have practically no technology in itself. This would help them to

grow more crops, more seed for new crops, giving the opportunity to be faster at their work and allow them to send out more harvest earning them more money for food and other necessities and altering the downward spiral of food insecurity. By doing this rural farm families would be able to produce more harvest which therefore in return they will sell surplus yield, they also will receive the much needed increase in income that will help to supply them with food security.

The MDGs (Millennium Development Goals) that would correspond with Belize would be; food security, economic development, child and maternal health, environmental sustainability and targeted developmental assistance. The reasoning for these is because you might think that because Belize is not a third world country, that it's pretty well off and doesn't need all this assistance. Well that's wrong because even if it's not a third world country they still need help. One of the major areas of need is food security. In the United States we don't really wonder when our next meal is going to be, while the poor rural farm families of Belize are faced with this every day. The next issue is economic development of Belize. Belize is a country of which does not make enough money to sustain itself. The people of Belize need to be educated on how to handle the income they receive and how to spend to the most of their benefit. The third issue is child and maternal health. The most malnourished people of Belize are the children ages 0 to 20 years. The children are most at risk for food insecurity because of what I mentioned earlier in this essay. The fourth reason is the environmental sustainability. Environmental sustainability in Belize is quite low due to the erratic weather, floods and hurricanes in Belize that cause the land to degrade and erode. As I mentioned earlier with what techniques may help with this problem. And the last issue is targeted developmental assistance.

Some of the appropriate community, national government corporations and other organizations, I believe, are positively affecting Belize now are the BRDP (Belize Rural Development Program), Plenty Belize and Caribbean Community (CARICOM). I would say that these organizations have taken the first steps to help the country of Belize. Each has a varied approach to food security in Belize and is working toward its reform in the near future, hopefully by 2015, with increased awareness of the public and their much needed financial support. Their focus is widespread with far reaching possible outcomes from School Food Programs (SFP) to Solar Power, school gardens (GATE), building farmer's markets and Information Technology centers (IT).

The Belize Rural Development Program (BRDP) funded by European Union (EU) and the Government of Belize have various projects throughout Belize. One of BRDP's projects is funding of large national agriculture, of which is livestock, providing information on processing and marketing. They also have 30 rural Information Technology (IT) centers. Currently the BRDP is investing in hundreds of micro grants to some 100 small group projects that train rural families, and most recently built the Cayo Farmers Market. Their course of action is to work with the rural poor people by investing in viable, sustainable and profitable activities or enterprises in order to increase income and profits for the poor. BRDP encourages local beneficiaries to "drive" and purpose the project along with taking ownership by contributing a required 25 percent. Their goal is to "empower the rural poor and to invest with them to create wealth and to eliminate poverty". (Belize Rural Development Program)

Another helpful organization is Plenty Belize. This group has several projects that are helping out Belize for example the GATE (Garden-based Agriculture for Toledo's Environment) program, Traditional Birth Attendant training program and solar energy applications. The GATE program works together with schools like Toledo District School Feeding Program (SFP) which they help the students in Toledo District of Belize, this is the poorest district in Belize and therefore claims the highest percentage of malnourished children in attendance, by supplying them with hot lunches and nutritious snacks during the days of school. GATE program, commonly initiated by the community themselves, helps create school gardens that are maintained by the teachers, students and community. The school gardens are organic and support

soil fertility and biodiversity at many levels. They can directly affect malnutrition by increasing nutritious foods free of chemicals for the farm families. (Plenty Belize)

What works? According to David J. Spielman and Rajul Pandya-Lorch of the International Food Policy Research Institute, "Sustained public investment in the hardware and software of agricultural development is critical. This includes public investment in irrigation scheme, rural road networks, rural education, market infrastructure, and regulatory systems. Long-term investment in the building blocks of agricultural development is a necessary condition for success and is evident in each and every success case". As you can see much has been done and is currently underway to bring about food security in Belize by 2015. I believe we have a good start, but there is much more to be done. While researching Belize I realized how little I knew or had heard about the subject of food security and how it is affected by climate changes and erratic weather. While growing up and living in the United States of America I have not been challenged, so far, with true food insecurity or its effects on the poor. I believe that as more and more people made aware of the need they too will choose to get involved in changing the world's food insecurity. Focusing on education and beneficiary involvement, I believe, are just the beginning of the tools we need to make a lasting and viable difference in food insecurity in the nation of Belize.

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