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Guatemala, Factor 6: Sustainable Agriculture

### **Guatemala: Permanent and Reliable Farming Techniques**

Norman Borlaug, founder of the World Food Prize once noted “Food is something that is taken for granted by most world leaders despite the fact that more than half of the population of the world is hungry”. While it is an unhappy fact, it is still a fact; half the world is starving and the population must do something about it. Living in a world where food is never further than 5 feet away from you is easy, but the sad reality is that there are millions of people who do not have a steady food supply, and this must stop.

Guatemala is said to be a place of beauty; mountains of terrain cover the land along with dense forests. But despite the seemingly healthy landscape, its people suffer from malnutrition and an unsteady food supply. According to The World Bank 53.7% of Guatemalans are considered to be under the poverty line, where an additional 15% of Guatemalans are also considered to live in extreme poverty ("Guatemala Overview", 2014). Furthermore a study facilitated by the World Food Programme discovered that chronic malnutrition is affecting 43.3 % of Guatemalan children under 5, with 80% of indigenous children living in Guatemala also being affected by chronic malnutrition ("Guatemala Overview", 2015). These statistics shed light on the increasing and devastating starvation that is plaguing the Guatemalan population, and supporting the fact that Guatemala needs a change in their farming techniques in order to increase food security and prevent further families from falling into poverty.

In recent years Guatemala has been plagued by natural disasters, steep land, and drought along with problems that have been caused by its own population, including deforestation, soil and water degradation, and a decrease in environmental quality. All these problems have come together to form a country that is on the path to becoming an unsustainable environment. According to the Environmental Economics Unit at the School of Economics and Commercial Law in Göteborg University "Guatemala is suffering from several environmental issues such as water pollution, air pollution, environmental health in rural area, deforestation, soil and land degradation, and over-exploitation of water sources". These issues have resulted in awful statistics such as the fact that five children die every day from water-borne diseases in Guatemala. Additionally it is discovered that 10% of the land in Guatemala has been highly degraded and an additional 63% of the land could become highly degraded in the near future. ("Guatemala Overview, 2014)

Not only is Guatemala being affected by these devastating environmental impacts, but its social stability is also being tampered with. In fact Guatemala's income distribution is ranked as the 10<sup>th</sup> most unequal in the world, with the richest 10 percent of the population controlling 50 percent of the nation's national wealth and the poorest 10 percent owning less than 1 percent. This unequal money distribution results in an equally unequal power distribution in the political system where the power lies with the richest 10 percent. This results in a domino effect where the land, money, and practically all the resources that Guatemala has to offer lands in the hands of a select few, which allows little room for poor and desolate workers to make a living and sustain themselves. Moreover this lack of financial stability in the majority of the population results in an inability to gain access to proper health care, healthy drinking water, or basic necessities. This social instability is a primary cause of food insecurity in Guatemala.

Moreover, Guatemala is being faced with a series of economical challenges that are posing threats to the population, more specifically the poorer half of the population. The World Bank reports that Guatemala has the biggest economy in Central America but suffers from the highest level of inequality and poverty. But while Guatemala's economy may look to be in good shape on a surface, it is also revealed in the same report that crime and violence costs make up for 7.7 percent of Guatemala's debt. Continually it is also revealed that the unemployed currently make up for almost half of those who are considered to be severely malnourished. It has also been discovered that a majority of the investment into agriculture is consumed by the expensive deforestation that is part of the slash and burn agriculture that is used in Guatemala. These statistics expose the fact that while Guatemala's economy looks good on a surface level, the money that is being spent is focused on the wrong things, thus causing issues such as poverty and unemployment.

Currently, the most common form of agriculture in Guatemala is slash and burn agriculture. This is the process where the farmers and settlers burn trees and bushes to clear new farm land and enrich the ground with nutrients from fertilizer and pesticides. This form of agriculture is only viable for 3 years until the land becomes unusable and new land must be cleared (New York Times, 1999). This form of agriculture is most commonly used due the level of desperation that peasants suffer from, so they turn to quickly finding a piece of land where they can farm to sustain themselves, but in the process they fail to account for factors such as environmental preservation and the fact that slash and burn agriculture is only a temporary solution. In fact slash and burn agriculture has shown to lead to soil degradation, soil erosion, loss of forest vegetation, and in some cases decreased water quality due to the immense amount of pesticides used during the process ( Yadav, 2012). But not only is this devastating form of agriculture ruining the environmental quality Guatemala, it's actually increasing. There was a tremendous increase in slash-and-burn land, 5.15 percent, in 2010 compared to the 0.83 percent that was witnessed in 1990 (Yadav, 2012). This increase must stop if Guatemala can have any hope at improving in any aspect of food safety, security, or sustainability. This rapid deforestation and water and land degradation must be stopped in order to sustain environmental quality in Guatemala so Guatemala can move forward in their goal to achieve food security instead of ruining the resources they have left. In fact the World Bank estimates that Guatemala will be unable to use approximately 76% of their land due to deforestation in the next decade.

In order to fix this monumental problem we must look to other forms of agriculture and solutions to this issue. One solution is organic agriculture, otherwise known as permaculture. Organic Agriculture is defined as a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system." (FAO/WHO Codex Alimentarius Commission, 1999). Simply put, it is a form of agriculture that is dependent on ecosystem management instead of external agricultural inputs, such as pesticides and fertilizers. Instead these previously used chemicals are replaced with specific management routines that maintain long term fertility and environmental health ("World Markets for Organic Fruits and Vegetables", Web).

The expected benefits of organic agriculture in the agriculture department includes expected increased diversity, long term soil fertility, high food quality, reduced pest/disease, self-reliant production system, and stable production (Curcefix, 1998). Organic farming has numerous benefits when concerning environmental issues. First of all, it discourages use of pesticides and other harmful chemicals that pollute the ground and water, leading to thousands of deaths a year. If organic agriculture is put into place it will minimize the runoff of pesticides and herbicides that pollute the water, improving the quality of life for

many Guatemalans. Continually it will also conserve water because organic farming requires much less irrigation than conventional agriculture (Chait, 2015)).

Second of all, organic agriculture improves the biodiversity and health of animals overall. Organic agriculture completes this by preserving natural habitats and allowing for natural predators to be natural pest control. Additionally, it helps animal health by exposing farm animals to chemical free grazing, sustaining the farm animals as healthy and productive animals. With that being said, while I do support the gradual decrease of use of chemicals such as herbicides and pesticides, I do not support the idea of taking GMO's away completely due to the fact that transgenic GMOS have proven to be very useful in providing seeds that are ideal for the Guatemalan environment.

Thirdly, Organic Agriculture improves the soil, combats erosion, and fights the effects of climate change. A study done by USDA Agricultural Research service reads that organic farming builds up organic soil matter better than conventional no-till farming. This is especially important in rebuilding Guatemala's agricultural capacity by re-building the soil that has once been made unusable, and preserving the environment in order to be able to grow sustainable crops. Not only does organic agriculture do this, but it also combats erosion; a rising problem in Guatemala. Erosion issues are affecting the land and food supply of Guatemala, but organic agriculture has only one-third of the erosion loss as other forms of farming, proving that it is the preferable method in this case. Moreover a research study has also found that since 1981, organic agriculture has reduced carbon dioxide in the area, slowing down climate change.

Not only does organic farming help the environment but it also helps social ills. The Natural Resources and Ethical Trade Programme also reports that organic farming is likely to improve health, better education, form a stronger community, improve income equality, and increase employment (Curcefix, 1998). Organic agriculture is proven to contribute to rural employment because organic agriculture results in higher demand for labor so therefore it will give the rural population an opportunity to be employed. This in turn will help close the gap between the rich and the poor because it will offer opportunities for the poor to earn money in order to sustain themselves and their families, thus raising a part of the population out of poverty and decreasing the number of people who are malnourished. Additionally it will offer more food security, which also leads to people becoming less malnourished.

Lastly, one must look to the benefits that organic agriculture will offer to the economic stance of Guatemala. The study from The Natural Resources and Ethical Trade Programme also reports that organic farming provides a stronger local economy, a self-reliant economy, income security, increased returns, and reduced cash investment. Local economies are strengthened because when organic farming is put into place the local economy is producing its own products, allowing it to be active in exports trade. This will allow the local economy to generate money for Guatemala as a whole, improving its economical stance. Additionally this will help establish Guatemala as a self-sustaining country because they will be generating their products on their own without outside help, establishing themselves as a country that is self-reliant and sufficient. When these benefits come together we clearly see that organic agriculture is preferable to any other form of agriculture in Guatemala because of its vast environmental, social, and economical benefits.

Some may be skeptical of this type of improvement due to the fact that there has been only a few instances of where this type of transformation has been implemented, but these few instances have been extremely successful in their transitions. An example of a successful transformation would be the Toledo District of Belize and the country of Argentina.

The Toledo District of Belize started out much like Guatemala is now; the people of the district relied on the subsidence of slash and burn agriculture to a great extent and they were being faced with the dim

prospect of diminishing land productivity. The people of this district were not only steadily losing their land but were also suffering from malnourishment and poverty. In the late 1980's the implementation of the Toledo Small Farmers Development Project (TSFDP). The main goal of TSFDP was to provide small and rural farmers of Toledo with the necessary equipment to sustain themselves through alternative methods of sustainability, such as organic agriculture. In 1995 an Interim Evaluation Mission from International Fund for Agricultural Development was performed on the TSFDP and the results proved successful:

The project has made progress toward its objectives of increased production and encouragement of sedentary agriculture through the provision of advice, better genetic material, credit and the allocation of surveyed plots of land to farmers under individual title...the project has helped coordinate marketing of rice through the Belize Marketing Board's milling facility and appears to have defined a niche to market "organic" cacao. It established two marketing/input supply depots and has trained personnel in the management of these, in addition to the one built by TAMP (Plenty Belize, 2000).

While the Toledo District still has a long way to go, even today, this project has made great improvements in the sustainability of their agriculture. Moreover, The Toledo District also has multi-faceted Garden-based Agriculture for Toledo's Environment (GATE) program. GATE offers local sustainable livelihood and addresses the multiple threats of environmental degradation, unsustainable agriculture, and poor nutrition. This program started through four local school and it has evolved into 38 more communities all supplied with regular extension support; tools, seeds, and other supplies; classroom activities; educational support to teachers in integrating the gardens into their curriculum; teacher training workshops; environmental education; educational materials; encouragement to start home gardens; and nutrition and food preparation education by Plenty Belize (Mason, 2012). The GATE Program has provided a good base for sustainable agriculture and has started a movement of organic agriculture in Belize.

Another example of a country flourishing due to organic agriculture is Argentina. In the 1990's half of Argentina's 36 million population was in poverty and the land was becoming increasingly unusable (Vann, 2002). In 1989 Argentina first began exploring the idea of organic agriculture by experimenting with wheat and by 1996 Argentina had successfully become certified in organic agriculture and were cleared to be on the European Commission's equivalence list for organic farming in third countries (EC Mission Report, 2000). After Argentina grew equivalence with the EC, organic exports began to account for 80 percent of all exports and the annual growth rates were over 100 percent in the second half of the nineties. Today, Argentina's undernourishment rate is below 5 percent of the population and has become a major food exporter with the ability to produce food for 400 million people ("World Markets for Organic Fruit and Vegetables - Opportunities for Developing Countries in the Production and Export of Organic Horticultural Products", 2001).

While Argentina's transition was largely successful, there were a few issues that they stumbled upon that should be documented in order to prevent the same issues from appearing in Guatemala. One of the major issues that Argentina struggled with was that producers complained about the limited availability of bio-pesticides because some farmers were experiencing pest problems and in turn had a smaller yield for it ("World Markets for Organic Fruit and Vegetables - Opportunities for Developing Countries in the Production and Export of Organic Horticultural Products, 2001). One of the ways this issue can be combated is with insect traps, disease-resistant crop selection, and biological controls such as predator insects and beneficial microorganisms("The Organic Label", 2008). Additionally there were reported complaints of farmers having an absence of a contract with importers until right before harvest leading to insecurity among the producers("World Markets for Organic Fruit and Vegetables - Opportunities for Developing Countries in the Production and Export of Organic Horticultural Products", 2001). This issue

was best resolved in Argentina through time and enacting deadlines. Many farmers reported that after the first 6 initial years of organic trade contracts began to become more consistent and reliable, moreover some companies reported that setting a type of deadline on their trade dates helped give importers an incentive to form contracts earlier (FAO, 2015).

There are two things that Guatemala needs in order to succeed in organic agriculture. First, aid programs must be sent to educate small and large farmers on how to maintain and implement an organic farm. Education is of utmost importance in this circumstance because without the farmers have little to no knowledge on how to actually sustain an organic farm, and thus will not be able to succeed in their endeavors in permaculture. These aid workers would teach farmers things such as how to maintain precisely controlled watering environment, raising beds, how to enclose water, and many more things. These programs are necessary and beneficial in every aspect when dealing with introducing organic farming, or permaculture. This aid could be provided US aid simply by balancing the budget so the US can use less aid money in sending pesticides and providing materials for slash and burn agriculture to sending tools and educators to teach and provide materials for organic agriculture. This could also be implemented through the Food and Agricultural Organization of the United Nations, The International Trade Centre UNCTAD/WTO, and The Technical Centre for Agricultural and Rural Cooperation all of which have had significant history in helping other countries implement organic agriculture

The second most important thing that needs to happen in order for organic agriculture to succeed is for there to be widespread support and implementation of organic farming. This can be ensured by spreading and informing the benefits of organic farming and informing the population the detriment of the current farming technique that is being used at this time. These two ways of implementation have proven to be successful in developing organic farming in various locations such as the Toledo district of Belize and Argentina, who witnessed major environmental, social, and economic due to their newly adopted farming technique.

A recommendation for this implementation is to start agricultural and economic activities prior to the actual implementation of organic agriculture in preparation for the transition that the country will soon have to make. This includes, but is not limited to marketing activities to raise the appeal of organic agriculture, improve their drainage systems in order to help the water supply and agriculture, and implement monitoring systems and contracts to monitor farmers work.

Guatemala is a gorgeous environment, there is no doubt about it, but the degradation of the environment might take that away from this country. The malnourishment and hunger that is experienced by over half the country is also unacceptable. As mentioned before Organic Agriculture will be very useful in Guatemala specifically for 3 main reasons. First, organic agriculture will facilitate and improve the quality of natural products that Guatemala can provide such as bananas coffee, cashew nuts, various vegetables, and various fruits. Currently Guatemala is falling behind in trade, with organic agriculture they will be able to increase their exports and catch up in the trade game. Second, the cost of fertilizers and pesticides are too expensive for rural farmers, making it near impossible for rural farmers to compete with the rich. Ultimately organic farming's system of using local farm based techniques allows poor, risk-averse famers to produce food and income for their families, adding to the appeal of organic farming. Third, it benefits the Guatemalan landscape and offers a long term, permanent solution for farming. As mentioned earlier, Guatemalans are utilizing the slash and burn farming technique as their main strategy for farming. This is unhealthy and detrimental to Guatemalans because it is not only destroying the environment but it is only a temporary solution to a long term problem. Organic farming can be sustained year after year after year, providing the agricultural stability that Guatemala so desperately needs. We must implement this form of farming because as Norman Borlaug said, we cannot stand by and take food for granted and not help while millions of others are starving.

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