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Guatemala, Factor 8: Spoilage & Waste

GUATEMALA - Food Spoilage and Waste

Oxygen, water, food, and sleep are the four basic human necessities for survival. In developing or poverty-stricken countries, meeting the basic needs of clean water and sufficient food can be an enormous challenge. This is no different in the small country of Guatemala where food spoilage and waste has a huge impact on the economy of the country and the health of the people. As food spoilage and waste is one of the biggest environmental issues in Guatemala, being able to reduce or eliminate this dilemma would greatly benefit the citizens in numerous ways.

The small country of Guatemala is settled in Central America, west of the Caribbean Sea. The varying climate consists of hot and humid lowlands and cooler highlands, while the terrain is very mountainous, with a narrow, plain coastline (World Factbook). Just as the climate and terrain vary greatly in Guatemala, so do the people. There is a wide variety of customs, cultures and languages within this country of over 42,000 square miles. Unfortunately, more than half of Guatemalans live below the poverty line (The World Book). The typical, rural Guatemalan family is composed of an average of five people, including a mother, father, and 3 children (World Factbook). Their diet generally consists of eggs and fresh fruit for breakfast, black beans, rice, tortilla, and chicken or beef for lunch and dinner. Tamales and empanadas are usually eaten as snacks. Education in Guatemala is free and required for 6 years. Their 3-tiered method of learning starts with primary school (elementary), moves on to secondary school (high school), and finishes with tertiary education (university) (USAID). Currently, the condition of education in Guatemala is notably under-funded and the classroom space, equipment, furniture, teaching materials, and water/sanitation do not reach minimum standards in most of rural Guatemala. During the required stage of education, it is difficult for children to attend schools, especially in rural areas where the schools are the scarcest. To make matters worse, most believe the time spent on education could be put to better use working to sustain the family (Wikipedia). Guatemalan government has also been trying to improve access to health care since 1996. Despite the fact that there is difficulty putting this into practice, the country's Constitution declares health care is a fundamental right to all Guatemalans (The World Bank). After 36 years of civil strife that ended in 1996, Guatemala has been trying to improve many of these key areas. As recently as March 2015, the Guatemalan government has committed to investing in the improvement of education more aggressively by the end of 2016 (www.whitehouse.gov).

As well as investing in the improvement in educational opportunities, the government has pledged to invest in economic growth. Since agriculture is a significant part of Guatemalan life, especially for the indigenous population, the improvements have potential to positively impact the farmers' situation. Little of the land in Guatemala is being used for crop or pasture even though almost two-thirds of it is available. Agriculture provides almost 14% of the GDP and employs 32% of the labor force (World Fact Book). The crops grown there include coffee, sugar, bananas, and cotton as the primary cash crops, with hemp, essential oils, and cacao following. Corn, rice, wheat, fruits, and vegetables are simply grown as subsistence crops (Encyclopedia of

the Nations). The animals raised include those such as chickens, cattle, pigs, and sheep (www.quetzalnet.com). Because the Guatemalans have many wise farming traditions, many agricultural practices are incorporated into their lifestyle. A few of their farming customs include increasing the amount of water and organic matter in soil; this is called zero tillage (World Food Programme – Guatemala). Another rural practice that is used is the decomposing of leaves and soil, worm compost, and making a foliar fertilizer from fermented leaves, water, and cow's milk (Eurasia Review).

There are several environmental barriers to agricultural productivity in Guatemala. Guatemala's primary environmental issues include deforestation and soil erosion, followed by water pollution and food spoilage/waste. Deforestation is a main issue because the forests are quickly disappearing due to the high benefit of land for gold mining, road construction, land clearing for cattle pastures, farming, housing and urbanization, timber, and growing large scale cash crops like soy, coffee, and palm oil. Cutting down these trees affects global warming, fishing, tourism, homes to many species of plants and animals, and soil erosion. Although these activities are all important, the consequences are heavier than most farmers expect (Encyclopedia of the Nations). Because of the main deforestation issue, soil erosion has now become a bigger problem. Without trees to anchor the soil, it is easily exposed to sun and has a higher tendency to dry out, causing issues such as increased flooding and incapability to farm. After the clearing of trees, the regular cash crops are planted, which can actually worsen soil erosion since soy, coffee, and palm oil roots are inept for holding together the soil, unlike tree roots. Besides deforestation and soil erosion, water pollution is another principal obstacle (Mongabay.com). Because of the countless uses of water for every day life, water pollution has always been an important environmental issue in Central America. The bodies of water located in and around Guatemala are constantly contaminated by physical, chemical, radioactive, or pathogenic microbial substances (Encyclopedia of the Earth). Lastly, spoilage and waste is a fourth major barrier in Guatemala today. Farmers lose approximately 15% of their income to food spoilage. Spoilage negatively affects the amount of harvest they can sell and, on occasion, farmers may choose not to harvest in order to reduce the hard labor resulting from diminishing returns. The farmers work to produce crops but not enough is produced due to the spoiling and wasting of the food. Consequently, water, seed, fertilizer, labor, and their environmental costs are all lost, as well as the product. As these losses add up, the amount of crops yielded drops significantly and harmfully affects the ecosystem (The Rockefeller Foundation).

Another barrier facing a Guatemalan family is the impediment to employment at a living wage. Currently, it is illegal in Guatemala for companies to pay per hour. They are only able to pay per full working day (8 hours). Because of this law, the many people that are only available to work less than 8 hours do not get hired because the employers are not willing to hire under a monthly minimum wage if they are only working half the legal 8-hour day. Cristian Álvarez from the Centro de Análisis de las Decisiones Públicas says, "A minimum wage is not a measure set to help the poor, but in a broader sense is the legal prohibition for any human being to work for less than a standardized amount. This causes the employer to just stop employing people at all, which means firing, or to stop employing them formally (panampost.com)."

In order to combat the many issues holding back progress for the country of Guatemala, the government has partnered with the governments of El Salvador and Honduras to establish the "Plan of the Alliance for Prosperity in the Northern Triangle." Among other goals, their mission is to stimulate economic growth, and improve infrastructure (World FactBook). They are

counting on financial support from other countries. In fact, the Obama administration has put in a \$1 billion dollar budget request for assisting Central America (U.S. News and World Report). The solution proposed to alleviate the food spoilage factor ties in with the goals of this plan.

Despite the challenges surrounding the environmental and employment issues, the problem in Guatemala that is both solvable and preventable is the spoilage and waste of food. The complications involved in solving this problem arise in preserving food while maintaining its quality and nutrition. The majority of food wastage occurs at the consumption and retail stages (Rockefeller Foundation). Major issues affecting this factor include the lack of cold food storage capabilities and the ethnic discrimination that sometimes prevents viable aid and funding to reach the rural poor (www.eldis.org). Solving this factor would affect many aspects of Guatemalan lifestyle, including household income. Almost one third of the world's food supply is wasted annually and reduces income of smallholder farmers and downstream value chain actors by 15%. Households living in extreme poverty spend as much as 60-80% of their income on food (Rockefeller Foundation). Preventing food loss would provide more food for the family and also enable them to earn sufficient income to purchase food since they would save around 15% of the family's income (Rockefeller Foundation).

Resolving this problem would also increase food availability. Availability of the food on the market is essential, but getting the products to the market is a large challenge. Fruits and vegetables are most wasted although they are the second largest category by production volume; they have the largest opportunity for improvement. Successfully preventing food spoilage at both the storage step and the consumer step would feed one billion more people by 2050. In addition to household income and food availability, preventing the decay of food would also increase food quality. Cold-chain storage mechanisms, which are vital but not always available, guarantee access to safe, high-quality foods for consumers (Rockefeller Foundation). This factor also plays a part in causing a food shortage for Guatemalan families. The family produces enough food; however, they lose much of it due to spoilage and waste. Overall, eliminating spoilage and waste would better the nutrition for the whole country.

Presently, the status of food spoilage and waste is worsening due to the deterioration of sanitary conditions for food preparation, processing, and production, as well as the augmenting of bacterial multiplication, which increases the risk of spoilage and contamination (ucl.ac.uk.com). The environment that Guatemalans live in is being degraded in many different ways simply from lack of food. These measurements indicate the situation is changing for the worse and, because of this degradation, the situation of a typical Guatemalan family is getting worse as well. Improving this factor would not only greatly increase the amount of food, but it would also better the environment by giving more families food, develop the economy, and reduce poverty (foa.org). With an increased ability to preserve food, the Guatemalan economy would grow and prosper more quickly. The farmers would not struggle to feed their families as much as they do currently, and families would have better health because of the increase of good quality food. Having a sufficient food supply would also result in fewer illnesses allowing the Guatemalans to save time and money that would have been spent on health care, as well as recoup wages that would have been lost due to missed work.

In order to solve this massive problem, a fairly simple solution has been recently developed: FreshPaper. This product is simply a piece of specially made paper that would be placed with the fruits and vegetables in order to extend the shelf life of the food. "FreshPaper sheets are infused with organic spices that keep fruits & veggies fresh for 2-4 [times] longer,

naturally (fenugreen.com).” Using FreshPaper is an easy way to reduce spoilage and waste in Guatemala. If the Guatemalans could use FreshPaper, or a similar product that they develop, themselves, it would help them preserve their food longer, especially the fruits and vegetables. When evaluating the feasibility and appropriateness of technologies to solve this factor, certain characteristics must be kept in mind. A developing country must have easy access to the technology, as well as affordability, government and community support, and the promise of increased income. Using a lot of resources that don’t naturally occur in Guatemala or would cost a lot to obtain would make a technology inappropriate for Guatemala. Also, expensive solutions that create a bigger problem would be inappropriate, for example, water treatment plants that create more pollution elsewhere. FreshPaper is a simple and quick solution while other ideas can be effective but slow to make a difference. This product has the potential to be made at a reduced cost, especially if using local resources.

In addition to FreshPaper, other technologies that might be helpful for post-harvest waste and spoilage could be water sanitation practices and establishing infrastructure for improved storage spaces for food, especially cold storage. The infrastructure is important to extending the life of food. To solve the problem of all the post-harvest waste, cold storage would be the top priority because that can also preserve dairy and meat longer, even though it is such a huge undertaking that requires not only buildings but electricity. With the government’s commitment to improving the infrastructure, cold food storage may be a reality in the near future. One of the specific commitments made by the countries in the Northern Triangle Alliance is that “they agreed to promote an integrated, efficient energy market by modifying the regulations governing the regional electricity market by 2016 (The White House).” Until that happens, though, the solution of FreshPaper is more appealing in that it is able to be implemented somewhat quickly.

In order to make FreshPaper accessible to the Guatemalans, a few options can be considered. In the United States, an average cost of 480 sheets of FreshPaper is \$150 so the cost of gaining access to a large amount of FreshPaper could be a challenge. Seeing the many benefits an increased consumption of fresh fruits and vegetables would provide for their citizens, though, the Guatemalan government could budget money to supply FreshPaper in Guatemala. However, this would make those needing access to this dependent on the government aid. There could be a few barriers with the government of Guatemala funding the solution to the spoilage and waste issue. Because of Guatemala’s mixed variety of Western and indigenous customs, cultures, and languages, Guatemala is a culturally complicated region (CS Monitor). Consequently, it is a challenge to convince the government of spending their money in this way. Although it is beneficial to the country, it is difficult to change the attitude of the government and introduce them to new options. However, there are ways to overcome this difficulty. Some key goals of the Northern Triangle leaders would support such a project as giving Guatemalans access to FreshPaper and educating them on the benefits and practices of using FreshPaper, or developing a similar product, along with other smart business practices to help farmers make a profit. The goals stated by the Northern Triangle include promoting private investment, developing public investment plans to support economic needs, and developing “specific strategies for women’s economic empowerment (The White House).” Also, finding the money to budget for FreshPaper is plausible by taking it from another source including taxing tourists and businesses that tend to pollute the waters. In fact, another goal of the Northern Triangle is to simplify their tax code and enhance the tax base through more effective administration making it feasible to depend on government support (The White House).
Educating tourists and businesses

about clean water practices would help decrease water pollution. Another excellent way to expand the budget for investment in smarter agricultural practices is to increase the sale of essential oils, which are naturally found in Guatemala, due to their growing popularity around the world.

Gaining government support for a solution like FreshPaper may seem like a daunting task, but there are models of other countries experiencing success. Ethiopia is a perfect example. By raising government spending on agriculture to 15% of its budget, crop yields are up 25%. Hunger has gone down to 35% (World Food Programme & Good). Additionally, a project similar to one developed in Uganda could be developed with one of the staple foods in Guatemala. The sweet potato project was started to help the malnourished people in Uganda. HarvestPlus introduced a sweet potato enhanced with more vitamin A to “improve household nutrition and agricultural livelihoods through production and consumption of these bio-fortified sweet potatoes (USAID).”

While government aid is a possible option, a better option to reduce cost is that the company of FreshPaper could allow the patent to be used by the Guatemalans so that they can produce FreshPaper themselves and not rely on donations for this product. Then Guatemalan families could be involved in reducing spoilage and waste by using FreshPaper in selling, marketing, and keeping their produce in order to preserve it longer and benefit themselves and their consumers at a reduced cost. This second option is a viable possibility because the founder of FreshPaper has stated that she hopes to allow all people of the world to enjoy fresh fruits and vegetables. Their mission is “Fresh for All (fenugreen.com).” The FreshPaper site shows research of extending the life of fruits and vegetables to allow the farmer more time to take the products to market and more time for the products to be consumed at home. With more produce available in people’s homes, they can sell more produce since they don’t need it for themselves.

Yet a third option along the lines of FreshPaper is for Guatemalans to use the many herbs that grow naturally to create a similar form of paper that will preserve perishable food. This third option takes into account the mindset of the Guatemalans who already possess wise agricultural management practices as stated earlier. This solution would also require time to develop and test a product to prove its effectiveness, as well as the personnel to accomplish the task. Again, the goals of the Northern Triangle leaders could fund an effort like this, especially for the women of the community, as part of their effort to empower women’s impact in the area of the economy.

The Guatemalans value use and re-use of natural resources, as demonstrated by their practice of zero-tillage and creating their own fertilizer. Because the people of Guatemala struggle with lack of food, reducing spoilage and waste would benefit them in significant ways. The economy of Guatemala and the health of the people are the two biggest areas that would be positively impacted. Providing FreshPaper is the simplest, and possibly quickest, way for the Guatemalans to solve this problem in their daily lives. However, since it is important to strive for education and empowerment of the people so that they can pass on the practices and lessons learned to the next generation, finding a way for the Guatemalans to produce a similar product from their own herbs and spices would not only provide a more sustainable solution but support the dignity of the people.

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