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Belize, Organic Fertilizers

**Improving Belize’s Food Waste and Food Production**

Did you know that 1.3 billion tons of the food the world produces gets wasted? Now where does all this food go? Everything from consumable food products, household food waste, and waste products from food manufacturing facilities end up in landfills. (Aldana 2022) With the acknowledgment of improper food disposal in Belize, Belize also experiences malnutrition, poverty, and water pollution. If Belize were able to innovatively dispose of food waste, they could work towards a solution to their state’s health issues and supply for the hungry and poor population.

Belize is a Central American country that bords Guatemala and Mexico. Within Belize there is 419,137 occupants, 46% being urbanized and 2.3% of them becoming urbanized annually. (CIA 2024) The eastern side of Belize is directly next to the Caribbean that attracts heavy tourism and consists of many populous cities. The western side of the state is mountainous and the population living there is more dispersed and rural. Most to all of Belize has a tropical climate with swamps, tropical jungles, and mangrove forests along the coast. (“Belize” 2022)

Most Belizeans are of different ethnicities this being, Mestizos (Mayan and Spanish heritage), Mayans (Yucatec Maya in the north and Mopán and Kekchí Maya in the south), and Creole (English-speaking people of largely African and British ancestry). (Alford 2024) So, the wide-spread influence is clear. The variety of ethnicities is due to the foreign descents of Britain and Spain when they came and affected the population living in Belize. However, Britain primarily changed Belize due to the control they had beginning in 1862 and furthermore the disputes between Britain and Guatemala that delayed the independence of Belize until 1981. (CIA 2024)

Immigration is very prominent in Belize (being that 15% of the population has immigrated in from either Honduras, Guatemala, or other countries in Central America). And 16% of Belizeans live abroad. 6.9% of the land is used for agricultural use, which produces sugar, bananas, oranges, and maize (because the country consists of tropical weather). They also cultivate the land for livestock. A typical family consists of 4-5 members (CIA 2024) and their diet consists of beans and rice with meat or fish and fried plantains. (Gonzalez 2024)

As the global population increases, food production will have to produce almost 50% more food, feed, and biofuel to support the global food demand in 2050. Small scale farmers in Belize are going through a demanding time producing big crop yields due to increasing prices of fertilizer. However, there are also other things that Belizeans suffer from, this being water pollution and poverty. Belize bords the Caribbean so a lot of the rivers throughout Belize flow into this large water source, and sewage, industrial effluents, and agricultural runoff are polluting their water streams. (Aldana 2022) This makes it difficult for the rural population to find a clean water source since they rely on these water ways which then ultimately causes their health to suffer and decline over time.

According to the Statistical Institute of Belize, 59% of the population in 2018 was in poverty. And of the 6 districts in Belize, all except Corozal had an increase in poverty. This meant that about 106,202 households were in poverty. The poverty levels per household were most common in larger houses that usually consisted of 7 members. Although poverty rates are high in Belize, more of the population has become urbanized, so more households are making it out of poverty and due to the commercial economy and exportation of goods, farmers are able to supply their families as well. After the hurricane in 2022 and recovery on tourism in Belize after the pandemic, their economy has been able to recover and help support their poor population. (OCHA 2022) In return came the exportation of more goods and more profit. But with the production of more food (Bananas, sugar, oranges, etc.), food waste was a result from this.

Belize’s production of bananas produces about 86,210 tonnes annually (as of 2022) (Knoema 2022) and this is good for the economy when it comes to the exportation of it, however, when the civilians use the food for themselves, the banana peels are commonly disposed of incorrectly, and with such a high production rate this waste adds up. And because the poor populations also lack the proper nutrition from the food they eat, the nutrients from the food produced is important regardless of the waste because it is essential in children’s development and the adult populations lifestyle. Now, although the issue is not in the production of bananas, but the disposal of the remains, a helpful way to improve the buildup of waste that can also be beneficial for food production in Belize, is composting.

A solution to food production and waste is by composting. This is beneficial because composting your left-over food scraps is important for many reasons, it can help prevent the massive food waste rotting in landfills, improve productivity (Aldana 2022), and help regenerate soil. With the massive production of bananas in Belize that are either sold or used for civilian usage, those banana peels are of easy access and free to use due to high quantities (becoming beneficial over time). Also, when bananas are produced that are considered “rejects,” they are tossed over to whomever can access them. (Silva 2019) And this method is good for the people who need the nutrition but what happens once they rot? These banana peels and or rotted food just gets thrown away. This is bad for the environment because the rotted food is dumped into a landfill. If Belizeans were to repurpose their banana peels by composting instead, they could work to create fertilizer from these food scraps. This method is less expensive for the public and would prove helpful when producing crops to feed the hungry and poor population. It would be made possible for Belizeans to compost by using the Resource Recovery and Recycling garbage company that has three major sites in Belize city and one near Ladyville. Conveniently they are of access to Belize City, Belmopan, San Ignacio, Placenia, Orange Walk, Corozal and Ladyville. This company values reducing non-recyclable waste into landfills. This includes glass, plastic, cans, old or broken electronics, and food waste/garbage. They also want to provide efficiency, reliability and ensure transparency in all operations. Thus, making service through them reliable and efficient. Some companies that Resource Recovery and Recycle are affiliated with are BTIA, Belize Audubon Society, and the Recycling Council of Belize. (Resource) Composting is beneficial for garbage centers because it restricts the amount of leftover food rotting amongst the other possible recyclable items. This food (if disposed of correctly) can add nutrients to the soil to make healthy and accessible fertilizer. If composting became more prominent in at least 30% of the agricultural land and sufficient households, the composted food remnants including banana peels, could make enough fertilizer to help supply the small scale farmers soil with enough nutrients to produce more yield that can feed more of the population and become easier for the people in poverty to access. For example, Chaa Creek Lodge disposes of their food waste and other organic materials such as trimmings as compost that is then used as fertilizer at the organic Maya farm. The Maya Organic farm is 33 acres and provides fresh products for the lodge at Chaa Creek and the Macal River Camp. (Aldana 2022) Also, if the crops grown were used to export, this could bring in a good amount of economic income that then could improve the economy of Belize and go towards the population in poverty.

These organic fertilizers have enhanced crop production allowing farmers to produce more food on less land, and due to the cost of chemical-based fertilizers increasing, composting has become cheaper and more efficient for farmers in Belize. (Aldana 2022) Not only are organic fertilizers more cost efficient, but they also reduce climate change because they improve soil health which limits the emission of carbon from it. (Aldana 2022) The reason organic fertilizers are better for agricultural production is because the effects of the Green Revolution and the usage of genetically modified crops and fertilizers heavily affected the natural environment. This includes land degradation, over-extraction of groundwater, build-up of pest resistance and the erosion of biodiversity. However, without the addition of fertilizers crop productivity would significantly be reduced. (Aldana 2022) So, when looking at the choices of how to efficiently produce more yield that is safer for the environment and not as expensive to the user, organic fertilizer is the obtainable option.

The disadvantages of composting in Belize could pertain to high sea level rates and the fact that Belize is situated in a hurricane belt (Young, 2008) because if a family near the coast was to set up a composting bin in their backyard and a tropical storm were to hit, it is quite possible that everything they were composting would get dismantled and ruined. Let alone, the soil nearby the ocean (being very moist) would be difficult to use due to it taking longer to breakdown scraps and food leftovers because of the extra amount of moisture. Another disadvantage of using organic fertilizers made from composting would be doing so. The person who is making the fertilizer can use simple materials but would have to wait while the food scraps decomposed and broke down. Let alone the manual labor that is also needed. However, whenever you are doing farm work (using organic or synthetic fertilizers) it takes manual labor anyway. It just depends on the situation of the farmers and if they have access to the materials to have an efficient area dedicated to composting, luckily there is no real equipment that requires electrical energy in supporting a composting bin.

With the addition of creating organic fertilizers by composting, Belizeans should be able to efficiently produce higher yields on smaller areas of land. And because of this, exported and imported goods would be beneficial in more than one way. Exported goods such as bananas, oranges and sugar will bring higher income rates that help improve the economy. The imported goods that are sold at local markets will be good for the hungry population and for small scale farmers families. A major benefit would be in the case of the decrease in cost a farmer would need to spend on fertilizer for their crops, so then when these crops are sold, they won’t go for as high of a price due to higher yield amounts and cheaper materials. So, composting as a whole would be beneficial for Belize in more than one way (food production, fertile soil, food disposal, and poverty issues related to the economy).

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