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Malawi, Factor 6: Sustainable Agriculture

Sweet Potatoes, A Solution to Food Insecurity in Malawi

In Malawi more than half the country lives in poverty. The country has struggled for years to produce enough food to sustain its population. Sustainable agriculture is a major factor in food insecurity in Malawi. By investing in the production of sweet potatoes and the use of crop rotation this would help 80% of the population. This would be just the first step in bringing the population out of poverty.

The Republic of Malawi is a landlocked country in Africa. It is bordered by Tanzania to the northeast, Zambia to the northwest, and Mozambique on the east, south and west. Malawi covers 94,080 square kilometers of land and 24,404 square kilometers of water. The climate is subtropical with the rainy season lasting from November to May and the dry season from May to November. Lake Nyasa, spanning 580 kilometers long, is said to be the country's most prominent physical feature. It is known for having more fish species than any other lake on earth. Malawi may be the 100th largest nation in the world, but it is also one of the most densely populated and least developed countries. Malawi has a population of 19,196,240 people and 80% of the population lives in rural areas. In 2010 50.7% of the population of Malawi lived below the poverty line and only half of the population over the age of 15 can read and write. Most children stop going to school before high school to work in their family's fields or care for younger siblings. This creates a gap in needed education in the country and provides some challenges when facing food insecurity. Attending college is rare due to the competition of getting into one of Malawi's three universities or 5 colleges. Many who have the money to attend a college choose to study abroad in Germany, the United Kingdom, or the United States.

A typical house in Malawi is constructed of sticks and mud. Houses are often built close together in small compounds. Typically a house has separate rooms for sleeping, eating, and storage. Manure from cows is used to build the floor and showering is done outside. Getting water is often a feat in itself. It is usually carried great distances from a lake or river for showering and from a well for cooking. Most of the cooking is done over a wood or charcoal fire. So what do Malawians eat? Maize, which is a British term for corn, is a staple in the country. Nsima is eaten twice daily and is a dish of boiled cornmeal which contains very little protein and vitamins. Fish is the most affordable source of animal protein. Fruits such as mangoes, melons, oranges, bananas, and pineapples are common.

Marriages are often arranged in Malawi and on average women will have 5-6 children. The life expectancy is low and the maternal mortality rate is high due to disease and lack of health care. The leading causes of death in the country are HIV/ AIDS, Acute Respiratory Infections, and Malaria. The best hospital in Malawi is considered to be the Seventh-Day Adventist Hospital in Blantyre. Queen Elizabeth Hospital is also in Blantyre. Malnutrition is a major health problem facing underdeveloped countries around the world and is one of the leading causes of death in Malawi. This is not just from a lack of food but also a lack of nutrients. Nsima is a popular dish because it is easy to get and produces the feeling of being full but it also has a low nutritional value. Less than half the children born will live past the age of 5. According to a USAID article, "In Malawi, 800,000 children under 5 are malnourished and 1 million suffer from vitamin A deficiency" (Kachisa and van Vugt). Vitamin A deficiency can cause blindness and can also increase the risk of fatal infections. Zinc deficiency is also common in Malawi. Approximately 60% suffer from zinc deficiency. Zinc deficiency can cause stunted growth, loss of appetite, and impaired immune function.

There are many factors that keep farmers from producing enough product to sustain the country. Some of these factors include droughts or the opposite, floods, increased soil degradation, and insufficient amount of agricultural land. The average farm size in Malawi is one hectare (2.6 acres), compared 434 acres in the United States. 59.9% of Malawi's land is considered to be agricultural, 38.2% arable, and only 1.4% is used for permanent crops. Agriculture accounts for one third of the GDP and 80% of export revenues. The major exports include; Tobacco, sugarcane, cotton, dried legumes, tea, peanuts, and coffee. The most common crop grown in Malawi is maize. Most families have a small plot of maize but are unable to grow a sufficient amount of food. One quarter of the population runs out of food 5 months after the harvest. The factor that I chose to focus on is sustainable agriculture. Sustainable agriculture, according to the Grace Communication Foundation, is "the production of food, fiber, or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare"(sustainableable.org).

Malawi is struggling to produce enough food to sustain the country. With the population increasing rapidly there is more pressure on natural resources and that is where soil erosion and degradation begin. The biggest reason for crop failure is dry conditions and low nutrient soil. Farmers often burn off fields after harvest to prepare for the next season, this damages the soil and the nutrient within it that are needed to retain water. They often burn off fields because it requires little labor. The problem? There is not enough food being produced to sustain the country due to soil degradation and education on farming techniques, therefore causing the issue of food insecurity. Many families live day by day not knowing where their next meal is coming from. This is a major problem that needs to be addressed now to better the lives of everyone in Malawi.

I believe the best solution would be crop rotation. Crop rotation is the practice of growing multiple plants in the same lot. Crop rotation works by growing different crops, at different times

of the year, on the same plot of land. There are many benefits to crop rotation. When you grow one crop it takes nutrients out of the ground. One way of restoring these nutrients is crop rotation. "Different crops have different nutrient requirements and affect soil balance differently. Some, like corn and tomatoes, are heavy feeders that quickly deplete soil nitrogen and phosphorus. Thus, if you plant corn in the same spot year after year, that plot of soil will run low on nitrogen and phosphorus more quickly than other parts of your garden will" (editors of organiclife.com). For example farmers would grow maize during the wet season and sweet potatoes during the dry season as they can be grown in opposite seasons because sweet potatoes do not rely on rain or wet weather the same way that Maize does. Sweet potatoes contain high amounts of nitrogen which is needed after maize strips the soil of nitrogen. The main benefit of crop rotation is returning nutrients to the soil to increase crop production. This is an efficient way of doing this as you are also growing another crop in the process. In this case it would be sweet potatoes. Not only would you be returning the needed nutrients to the soil in order to boost maize production but you would also be producing sweet potatoes adding to the overall GDP and feeding larger amounts of people. Sweet potatoes have an average yield of 320 bushels per acre which equals 16,000 pounds. A 25-30 foot row can produce an average of 50 pounds of sweet potatoes. In addition to the ecological benefits sweet potatoes also contain high levels of protein and fiber, and are rich in both vitamin A and C, which would help cut down on the number of children suffering from malnutrition and vitamin deficiencies.

This solution is so simple it just needs to be communicated and implemented. The lack of education is one challenge the country has to overcome. As only half the population over 15 years old can read a write this presents a challenge. One way we can combat this challenge is to partner with programs to provide education and funding. The Malawian government has funded improved seed varieties and fertilizer since 2005. This allows "smallholders to buy a small amount of fertilizer and seed so that they could replenish the soil nutrients, take advantage of improved seed varieties and at least achieve a livable crop from their tiny farms" (Africa Confidential Newspaper). My proposal would take it a step further. With the help of programs and organizations like World Food Programme this solution is not out of reach. World Food Programme currently supports education by providing meals to about a million school children. 10% of the meals that are fed to the school children are made from food bought from local farmers. With farmers. If they were able to provide the materials to help farmers get started with farming sweet potatoes and help educate farmers on the importance of crop production and the process of planting sweet potatoes, it would make a huge impact on the country. In addition to the materials needed it is also important that they provide the needed education on how to grow sweet potatoes, the benefits and why it's important to the soil, and how this is going to help the farmers and their families. With education comes knowledge and knowledge is something the country greatly needs.

Sweet potatoes have been around for over 5,000 years and are part of the morning glory family. They are native to South America but are now grown all over the world. In fact, the country that produces the most sweet potatoes is China. China produces more than 130 million tons each year. Since sweet potatoes are not native to Africa they would need to be brought in. Sweet potatoes are grown from slips instead of seeds. You can order slips through the mail or start them

from existing potatoes. To begin I would recommend that farmers get slips that have already been started that can be planted right away and then they can learn the process of starting their own slips. To start them on your own slips you need to cut a sweet potato in half, use toothpicks to keep it propped up in a jar of water. They need warmth and a few weeks to sprout so it is suggested to put them in a warm place. Each sweet potato can grow up to 50 slips. Once the potatoes are covered in sprouts you can carefully separate them into slips to be planted. This process is one that would need to be taught to farmers in order to make this system effective. This program would need to have assistance to start up the project from organizations like World Food Program, but after farmers started using this solution it would essentially be self-sufficient because farmers can start their own slips each year. Once farmers are education on the proper practice of crop rotation they can continue to spread their knowledge to others in order to best serve the population.

The project initial itself would cost around \$9,000 to start with to plant an acre with already grown slips. If you were to plant the slips 15 inches apart in each row and space the rows out 4 feet from each other you would need 8,712 slips to plant an acre. One acre produces 16,000 potatoes then you can start growing your own slips, you need 160 potatoes to produce enough slips to sustain one acre. Out of the first crop of the initial acre you can plant 100 acres of sweet potatoes. After the initial cost of \$9,000 to plan the first acre there is no future cost because you are able to produce your own slips each year. This cost may fluctuate, and it may require a little assistance here and there in the years to come whether that is financial or educational. I believe that with this solution the country will be able to help 80% of its population in the coming years. Though Malawi is the 100th largest nation in the world it is still one of the most densely populated and least developed. Something needs to be done to change this, and now is just as good of a time as any.

“The quest for food security can be the common thread that links the different challenges we face and helps build a sustainable future” (Jose Graziano da Silva, United Nations Food and Agriculture Organization). It is apparent that something needs to be done about food insecurity in Malawi. There are many ways to address food insecurity, I have proposed only one solution of many possible to try to solve this issue. The solution I have proposed of crop rotation and planting sweet potatoes to renew soil quality and increase the GDP as well as giving the population need nutrients to address vitamin deficiencies and malnutrition in Malawi, will not happen overnight just as Rome was not built in a day.

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