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 Malawi, Agricultural Sustainability

### **The Improvement of Agricultural Sustainability in Malawi**

In a small east African country, there lie problems; problems that need fixing. Malawi is a country in a transitional stage. Malawi has overcome some almost impossible problems such as; constant drought, (International Federation of Red Cross and Red Crescent Societies) the push to abolish the Farm Input Subsidy Programme (a program to enhance food self-sufficiency by increasing smallholder farmers' access to and use of improved agricultural inputs [Chibwana, Christopher, and Fisher, Monica The impacts of agricultural input subsidies in Malawi]), and the invasion of armyworms (destroyed the crops of nearly 140,000 families- Mesina, Lameck Fall Armyworms Hit Malawi, President Appeals for Help). These problems have had a significant impact on the country, which is why with the help of several educational services, programs to re-fertilize the soil, and the development of irrigation systems, Malawi's agricultural sustainability will grow and become more balanced.

Malawi has a current population of 18.09 million people. This is more than Zimbabwe, with a population of 16.15 million people, and Zambia, with a population of 16.59 million. On average Malawi has about 512 people living per square mile. With a 16.45% of urban population, Malawi's population is mostly rural with 83.55% of the population living in non-urban areas, according to The World Food Bank.

Like both Zimbabwe and Zambia, Malawi is a multiparty system. On February 1st, 1963, Dr. Banda was named prime minister after Malawi, formerly Nyasaland, was allowed to secede from the Federation on December 19, 1962. When the Federation was formed in 1953, it consisted of Northern Rhodesia, now Zambia, and Southern Rhodesia, now Zimbabwe. Independence from the British Commonwealth occurred in May 1963. Malawi then became a republic with Dr. Banda as its president. (Misachi, John What Type of Government Does Malawi Have?)

Malawi relies on local government systems to make most laws and protocols. This, in theory, is a good idea because the local people know more about where they live rather than people living in the capital. However, while this works, in theory, the people in and surrounding the office have become corrupted. Even though today Malawi continues to have a presidential system and function as a republic, the local councils are the people who run most of the country.

Recently, the local councils have passed laws in hopes of protecting Malawi's agricultural system because, in Malawi, over a third of the country's profit comes from agriculture. Agriculture accounts for 38% of the country's gross domestic product (GDP)(The World Bank Group). This is an incredible number due to the fact that only one-third of Malawi's land is able to be cultivated.

According to Jacques M. May's *The Ecology Of Malnutrition In Eastern Africa And Four Countries Of Western Africa*, corn is the main crop planted and harvested. It is sometimes accompanied by sorghum and millet. The average farm size for smallholder farms, farms that produce food only for themselves to consume with only any surplus sold off, is 1.2 hectares which can roughly round to 3 acres. By comparison, The United States of America's average farm size is 442 acres and Zimbabwe's average farm size is 37 hectares or roughly 91 acres.

Malawi is a landlocked country in Eastern Africa. Three-fourths of the land is surrounded by Lake Malawi. Lake Malawi accounts for 20% of the total area that is considered Malawi. Malawi stretches 836 kilometers in length (519 miles) and varies in width from 80 to 161 kilometers (50-100 miles). Within the

area of Malawi, there are plateaus, mountainous regions, and the land in the southern tip of the Rift Valley. The varied geography gives Malawi a very diverse climate. The plateaus are cool whereas the valleys, in contrast, are very hot and dry. The mountains are different still, with the area of and near the mountains usually temperate. The year consists of three seasons ranging from November to March, April to May, and June to October. The main rainy season stretches from November to March. While the rain brings moisture to the land and in some case, is good for the soil. However, in this season the rain causes a lot of erosion which drains nutrients from the soil. The months of April and May are when the less rainy season occurs. The rest of the year, June through October, is the dry season.

The national average family size is 4.5 persons per family. 65% of the population live in traditional housing; this consists of mud walls and a thatched roof, whereas 16% of the population lives in permanent housing, such as concrete, stone, and/or brick walls with either iron sheet, concrete, or asbestos roofing. 18% of the population live in semi-permanent shelters, with concrete, stone, or brick walls and a thatched roof. (Makowa, Gladson)

The main diet of the people consists of corn and/or manioc (also known as cassava, a root of a tropical tree) however, sometimes beans and peas are also added. Most Malawians farm for themselves and cook the food of a fire on the floor of their house. The main job that Malawians have is surviving; there is no average wage for this. Most Malawians live on a day to day basis, which is why agricultural sustainability is needed more than ever. Only some families in Malawi have access to education. Primary education is free; however, most kids drop out due to the fact that their parents need them to work in the fields. There are some main roads in Malawi, but they are hard to get to especially if one has no mode of transportation besides your feet. This means that there are some markets but the food that is grown is mostly kept within the family. There are so many other barriers that Malawians face, such as access to nutritious food, and clinics.

There are several issues that affect Malawi greatly, such as pest invasions, drought, erosion, and others currently affecting the sustainability of the country. These issues have many side effects, including malnutrition, food insecurity, and an increasing population living under the poverty line. These conditions may not seem very real when looked at on a global scale, but they are very real to the people of Malawi that have to live with them every day. With the help of government programs, these conditions have not gotten worse but also have not gotten significantly better. Since there are no government programs implemented to help the people reverse the process that led to the problems they now face, the continuing depletion of minerals in the soil due to erosion has gotten even worse.

The large smallholder farmer population has contributed to the lack of nutrients and minerals within the land. Part of the issue is the lack of knowledge about the subject of soil fertility. As of 2014, 62% of Malawi's 15-24-year-old age group has not completed primary school according to the National Education Profile Update. Of all people employed 22% have no primary education, 26% some primary education, 26% primary education, 19% middle education, 5% secondary education and 2% tertiary education. The education percentages for own farming are similar, 23%, 27%, 27%, 19%, 3%, 1% respectively. Using this information, one can conclude that the newer generation has not learned the skills needed to be sustainable farmers. With the lack of education, the less environmentally aware the farmers are of how their actions affect the soil and other important factors, such as water and yield.

The issue of the lack of agricultural sustainability affects the rural population and the urban population equally. This is because while the urban population is not directly affected by the erosion of the soil and depletion of the nutrients in the soil, but they can be the victim of pricing. When there is a pricing increase, it is most likely caused by a supply and demand issue. This means that since the rural farmers have less yield and need to keep most of the food themselves, they have to charge more for their products in order to make a profit. The urban population, even though they only make up 16.45% of the population

versus the rural population at 83.55 %, have to pay significantly more for products in a market than the rural population when using local trade. (Republic of Malawi Malawi Urbanization Review)

Due to the lack of supply of food and the demand being higher than the supply, there is an increase in price. The rural population is affected differently than that of the urban population; they are more affected from the agricultural standpoint. Without modern irrigation systems, farmers lack the water they need in the dry season but have a significant amount more water than they need in the rainy season. This can lead to severe drought or flooded fields, depending on the season, furthering the depletion of the food supply for the area they provide for. Not only are the farmers victims of their inability to harness the rains, they also are affected by the byproducts of the cycle between the wet and dry seasons. This, in turn, causes erosion.

Erosion itself is a very big problem and something Malawi has had to deal with for a very long time. With the process of erosion, there come many effects which may include the depletion of soil nutrients, soil structure, and the contamination of waterways. All of these are problems that Malawi currently faces. Erosion is a sizeable factor not only the current generation is dealing with, but also the later generations will continue to struggle with as well. This can cause various problems in the future, like the downfall of crops, continuous bad seasons of harvest, sickness due to the contaminated water sources, and infertile soil. These problems threaten the continuation of Malawi's economic system since over 80% of Malawi's economic system rests upon the shoulders of the crops the people are able to harvest. (Our Africa, Economy, and Industry)

All the problems that Malawi is currently dealing with also affect women, men, children, and the elderly differently. Children and the elderly need more nutrients in their food in order to survive. While the life expectancy for males is 48.3 years and 51.4 years for females, the infant mortality rate is still high. The infant mortality rate for Malawi as of 2010 is 66 deaths per 1,000 live births according to the African Health Observatory (AHO); this is a problem that needs attention. For comparison, in the United States of America as of 2016, the average life expectancy is 79 years of age, and the infant mortality rate is 5.7 deaths per 1,000 live births according to the World Health Organization (WHO). Children are also the future of any nation and Malawi is no different. If the children are exposed to the problems they face without any solution, it can be very detrimental to their health. When people are exposed to these problems but with the addition of solutions, they can then implement them later in their lives, helping to reduce the effects of the lack of agricultural sustainability and solve the lack of public knowledge of this issue.

Men and women also deal with each problem differently. Men are very hands-on within the farm; men also usually work in the fields and tend to use the techniques they learned from those before them, such as techniques that were passed down father to son. These techniques may have worked 20 years ago, but due to climate change may not work now. The men try to fix the problems that they encounter by using the techniques that they used to get there in the first place. The women usually cook the food and provide meals for the family; this means they are only given limited options depending on what is brought in from the fields. This can unintentionally cause malnutrition in the children. The men, as well as the women, are not as affected by the lack of nutrition compared to the children and the elderly Malawians.

Without solutions to the problems Malawi faces from an agricultural standpoint, they cannot provide for their children which may influence the infant mortality rate. These problems mostly affect the indigenous people rather than the refugee and minority population. This is because Malawi does not have a large population of either refugees or minorities.

The issue of agricultural sustainability greatly affects the environment. In the desperate attempt to address the problem of the lack of programs and policies in place to protect the environment for future

generations, radical changes in the geography may occur. Many farmers may attempt to flatten the land around them while others will cut down the trees on their land which will only cause more erosion.

My plan is to work with the government and nonprofits to create programs to teach the young and the old how to farm better and how to keep nutrients in the soil. This program will consist of hands-on learning on a few acres to test the techniques learned. The program will also utilize the fewest amount of people from the outside community possible in order to help the residents not feel like outsiders are taking over and telling them everything they are doing is wrong. The volunteers and paid workers will work with both the people and the government to devise plans on how to help balance the agricultural sector of the economy. This may include urban gardens in the most populated cities. These cities may include Lilongwe, Blantyre, and Mzuzu. The development of these projects will depend on the support of the local government and the civilians within the city. With the support of the local government, this project can partner with the educational system and use the urban gardens to teach the kids within the schools about sustainable farming. In Malawi local government may be hard to work with. In order to win them over, volunteers may have to integrate within the village before they present an idea. With this, it may be possible to build trust with the local people and with the local government as well.

Throughout the world, there has been a big push toward teaching the younger generation the importance of sustainability. From sustainable energy to fixing the holes in the ozone layer, there has also been a push to be agriculturally stable. This may involve putting in urban gardens in crowded cities so that inner-city kids will have food at home that they can share with their families. Urban gardens have grown in popularity recently and involve kids of all ages. It gives the community an opportunity to invest in itself. Urban gardens take advantage of smaller spaces and vertical space as well.

The key to stabilizing the food sourcing and farming methods is to teach the younger generations without insulting the older generation. Urban gardens are the perfect compromise. They give the kids that are in school a fun activity to do and give them new interests that apply to their actual lives. The activities also give kids access to food that they would otherwise not have the ability to obtain. This will give the parents some more stability at home by relieving stress related to food issues and may even further elongate the time kids will continue going to school. Urban gardens also teach the kids some farming techniques that they can later use in life if they decide that is what they want to do.

Another way to get kids active in their community as well as giving them some small-scale food stability is aquaponics. Aquaponics is the process of growing plants using the natural fertilization of fish. The fish are placed in a tank and fed. The plants can be planted in several different styles and are something that warrants further exploration. The plants don't need soil; they only need the water the fish live in. Aquaponics uses the water of the fish and runs it to the plants; the plants then absorb the nutrients and the water can then be sent back to the fish. One can raise both the fish and plants. The process also decreases the likelihood of insect invasion. This is a big deal because of the armyworm infestation that Malawi currently has. This is not the extent of school programs that are out in the world, but they are the most effective.

Aquaponics is heavily centered on technology, which means there needs to be a sufficient amount of sophisticated plumbing as well as different pumps needed to filter the water and ensure consistent water flow. With a significant population living in harder to reach communities, it will be difficult to transport and construct such technology. Technology, while useful in a more urban area of Malawi, can still be used in rural areas. In order to produce the amount of energy needed to run such a project, like aquaponics, will require creative thinking. The methods used will depend on the area of Malawi in which the project is stationed. When near the lake, hydropower maybe an option or in other areas solar and wind. It is important to use sustainable energy, to create a project that is completely self-sufficient teaches children of the current generation that doing things correctly is better than doing things fast. It is the desire for

quick fixes are the cause of some of the problems that Malawi faces today.

While the previously proposed problems are pending acceptance from the government, there are several things that rural farmers can implement now. Some of the most important factors of farming are soil that has a lot of nutrients and is well fertilized. Malawi is currently struggling with nutrient-depleted soil. One of the ways to fix this is to rotate crops. Planting the same crops in the same field can deplete nutrients in the soil and make it difficult to have a successful farming season. While rotating crop is a good technique, adding new diverse crops will also help the nutrient depleted soil. This is because the new crops have different nutrients and when they decompose add the said nutrients into the soil.

As well as rotating crops Malawi farmers can reduce the time they till the soil. Soil tillage “...speeds decomposition of soil organic matter and the release of mineral nutrients.” (Tilman, David) with the help of rotating crops and the reduction of tilling the fields, it will give the soil a break and be able to absorb nutrients through fertilization or at the end of the harvest with the decomposition of the plants. Hopefully, this will address some of the substantial issues that face Malawi.

Aquaponics, urban gardens and the more immediate farming techniques, will also need to include responding to the problems that the low sustainability has caused such as malnutrition. This may include showing families how to cook more nutritious meals and coming up with meal plans based on the food available to them. It is a great way to see the process of the urban gardens and aquaponics system come full circle. The workforce involved with this would be made up of mostly volunteers and some full-time employees. This is a great way to counteract the problem of erosion and sickness due to the low yield of the fields.

When the aquaponic systems, urban gardens, the rotation of crops, as well as the reduction of tilling are put into place, it will provide a more stable life for Malawians everywhere. Produce prices will lower and relieve some of the stress on the economic situation especially in the urban areas. With the help of the new farming techniques, crop yield should increase leading to more supply and lower prices. If farmers add new crops to their fields, it will supply a more diverse selection of food all around Malawi. This can enhance the overall nutritional balance which can combat malnutrition. This, in turn, will help the overall quality of life in Malawi. The government no longer has to worry as much about bringing their people food and the side effects of not having it, this will give Malawians a better path to life.

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