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Kenya, Sustainable Agriculture

Kenya: Recovering the Splendor of an Agricultural World

South of Ethiopia and between Uganda and Somalia lies the Republic of Kenya. The estimated population of the southeast African country is 47 million people (World Atlas, 2019), and 72.9% of that population is rural. Kenya has a presidential republic governmental system with national and county levels. The total land area is 582,600 square kilometers (Stanford, 2019), some of which consists of humid Indian Ocean coastline, lush Central Highlands, Mount Kenya, and the Chalbi Desert (Ntarangwi, 2019). Kenya is on the earth's equator and yields an enjoyable, tropical climate with a dry and wet season (Ham, 2019). Unfortunately, the weather can be very unpredictable and begets the crop failures of farmers who cannot plan around the changing seasons (Nathanson, 2016).

Concerning malnutrition and hunger, Kenya is one of the more well-off countries in Africa, though it does face major challenges of its own. Most of the farmers in rural areas are subsistence farmers, which means they grow and harvest crops for the support of their own families (Africa and the World, 2019). Kenya's climate is inconsistent in terms of the wet and dry seasons and the unpredictability of the weather leads to common crop failures. Along with crop failure is the scarce amount of land that people own. The average Kenyan farmer owns about five acres, or two hectares, of land (Nations Encyclopedia, 2019). This isn't a great amount of land for a farmer to plant and harvest crops for his family. Kenya's biggest economic sector is in fact agriculture, and so these challenges have a huge impact on the country's overall stability.

Another issue currently trending in the country is the degradation of soil (Farmers Trend, 2016) due to loss of forests and overcultivation. Because so many people (half the population in fact) are below the poverty line, they try and find ways to make even a small amount of money. Trees in forests are cut down and the wood sold for money, used in construction, but mostly as firewood for cooking. Without enough trees, the precious topsoil is eroded from Kenya's lands, diminishing the amount of available fertile land for farming. Topsoil is earth's most valuable layer of soil because it consists of the primary mixture for plant growth. Water, air, and decaying organisms make up this rich, organic spread that is vital to agriculture. Without solving this issue we cannot even begin to help farmers because there won't be any farming soil remaining.

With the growing population Kenyans are finding a hard life in the urban regions of the country as well. The agricultural complications are reaching the cities and affecting the people who

reside there. A lack of food in rural areas has a directly negative effect on urban areas of that country. It has been found that a well-rounded agricultural division of a country has an enormous contribution to that country's economic development (Economics Discussion, 2016). In fact, agriculture is a direct step towards advancing the industrial capabilities of a country. Agriculture produces raw materials that can be processed into countless goods and sent out in all directions, perhaps across a continent. Agriculture provides the surplus of supplies a country requires, and the foundation for a sturdy infrastructure. Overpopulation in Kenya leads to a lack of services available to people, and farmers' worries about their food supply isn't helping. Many farmers cannot afford the proper equipment and machines they need for successful up-to-date farming. The lack of a modern advanced technology (Farmers Trend, 2016) in Kenya foretells that farmers will not produce enough crops to support the population anyway. We live in the 21st century, a very advanced and technological era. As the human race evolves, so do our practices in government and economics. Agriculture should not be limited to the cattle and the cornfields. There should be no reason for limitation when the world is constantly embracing new opportunities for growth. The answer lies with enhancing the sustainability of Kenya's agriculture.

The first step would be to get the solution across to the people, because it does no good to implement things that Kenyan natives will not be able to do themselves. English philosopher John Locke said that people are born with certain rights that cannot be taken away by any government or person. The United Nations created a document called the *Universal Declaration of Human Rights*, which describes those freedoms and powers that every person in the world possess. Among those are the right to self-determination, equal opportunity for advancement, and freedom of thought (United Nations Agreements on Human Rights, 1997). If you were to elaborate on self-determination, you might talk about how people want to work hard and accomplish things that enrich their lives. However, accomplishment is limited to the attainable. And the thing about freedom is that no person is created the same, nor has the same goals, not even the same situational conflicts. People naturally depend on other people through bonds of trust, and trust is earned, not given. Based on the Human Rights we have created, it is clear that every person deserves a working chance, and every other person is obligated to help others in whatever way they can. There exists no opportunity of advancement if you have nowhere to advance. There can be no freedom of thought if you were never taught the right way to think. There is no self-determination when everything is done for you. But when those that are obligated to aid others in need do so, it eliminates the "unknown" reach for working and replaces it with trust. People trust each other when they know they can rely on one another. However, people are more determined when they work for their own accomplishments.

With proper instruction on useful techniques of farming, Kenyans will not only learn and prosper in their fields of agricultural study, but also feel the satisfaction of growing healthy crops by themselves on their own land. The United Nations should be the organization to fund the teachings of proper farming and also supply them with correct machinery. If the equipment is not available for direct shipping to the country, then there should at least be the awareness of what is needed. Another benefit to teaching people of better ways to farm is that they will become a part of the solution. In other words, they can start to generate their own ideas, and work alongside

each other. We can do all the research we want, but nevertheless, Kenyans are the ones who live and farm in Kenya every single day.

Once the foundations of learning are placed in the hands of Kenyans, we can also begin to implement other solutions. To combat the unreliable climate, the United Nations could fund the construction of greenhouses. Greenhouses are used in the United States as well as other countries for the purpose of growing crops and potted plants in an area sheltered from strenuous weather conditions. The greenhouses provide shelter for plants inside via the roofs, while still allowing sunlight to penetrate and the plants to then photosynthesize. Greenhouses offer ideal surroundings for the specific crop that is grown inside, (Technology Network, 2019). For instance, a broccoli plant is hardier than a cucumber plant and would therefore require less regulation of temperature and sunlight. It is also easier to manage the soils used in a greenhouse. Some plants grow better in loose soils that are filled with organic matter, and others grow better in thin, sandy soils.

Another benefit to using greenhouses in Kenya would be irrigation systems. Greenhouses not only shelter the crops inside, but the irrigation systems that will also be built. Irrigation is controlled by a computer system and provides moisture to the crops as needed. This is an appropriate example of when Kenyan farmers would need to be provided with knowledge of these possible resolutions. Not only to be able to operate said systems in the greenhouses, but to understand and be able to teach the concepts of sustainable farming.

Each farmer should have at least one greenhouse on his/her property in order to provide a viable quantity of crops to sustain their family, as well as bring to the market. Along with the greenhouses come rain barrels. Rain barrels are often overlooked because they are so simple, but that's the point: simplicity is miraculous. When it rains, rain barrels collect water for storage. The rainwater can then be transported into an underground water storage tank. The irrigation systems in the greenhouses feed from the underground water tanks. Because so few rural farmers have access to electricity, an alternate method to a computerized system is a hydraulic pressure system in which the water movement is controlled by a valve opening and closing. Solar panels could also be the source of power for the greenhouse systems. Another very important benefit to building greenhouses is that the construction provides jobs and new career opportunities for the 40% unemployment rate in Kenya. Instead of having hired workers from other countries and the United Nations come out to Kenya and construct the greenhouses and irrigation systems, we need to teach Kenyan people all about how and why it works, and how to build and maintain it. Going back to the previous paragraph mentioning human rights, the right of self-determination relies completely on the given circumstance of knowing what choice to make. Again, people cannot be successful if they don't work, more importantly, if they don't work in determination of themselves. Greenhouses would help to further the advancement of the technological infrastructure in Kenya.

Along with farming technique alterations, the main solution for the environment is trees. Trees are the vast, marvelous, and impressive woody plants on our planet. They absorb carbon dioxide,

store the carbon, and release oxygen into the air. They provide shade for wildlife, especially for aquatic wildlife. The shade of the trees cools the water temperature, allowing for more oxygen to dissolve in the water. Higher oxygen levels are a sign of a healthy aquatic ecosystem. Of course, the Kenyan landscape is not one full of streams and rivers. But it does have a lot of open, dry land. Tree roots provide stability in the soil, holding it in place. The main goal of planting trees would be to prevent erosion of the precious topsoil that is vital to agriculture. Planting trees is hard work because it takes so much time for the trees to have an impact, but the longer we wait, the more we will delay in repairing Kenya's soils. Research should be done on where specific trees grow well and in which climate. For example, if there was a forest consisting of a high percentage of oak trees, it would be astute to replant that same land with oak trees because they had already been growing there for hundreds of years. The trees do not just have to be planted in reforestation areas. It would be beneficial to plant even simple shrubbery even on the level plains and farmland.

There is another resolution for the vulnerability of Kenya's soil; a nationwide composting organization. Composting is something that many people and organizations already commit to here in America. It is seen as a very green and eco-friendly practice that has many benefits. Compostable items include fruit and vegetable peels, egg shells, coffee grinds, newspaper, and dead leaves and brush. Once the organic matter has time to decompose, it forms a nutrient-rich dressing that can be used in place of fertilizer, and just for a plain soil substitute. If the composted matter is not needed for the crops being grown, a farmer can simply place it around trees, and dispose of it back into the environment. Along with creating organic fertilizer and new soil, composting decreases the amount of waste in landfills, which is always a good thing.

One of Kenya's biggest economic sectors is ecotourism of the natural landscapes, (Ntarangwi, 2019). Kenya is home to many beautiful wild animals including elephants, buffaloes, and leopards. Tourists can enjoy the natural beauty of Kenya through safari tours, rural ranches, and animal sanctuaries. Right now, a lot of these sanctuaries and wildlife rehabilitation programs are privately owned and run. If we can teach people, all over the world, the importance of preserving nature, we will have a better shot at protecting it. Not only do the people of Kenya need to be taught about the environment, but so do the visitors to the country. This doesn't have to be simply Kenya's problem, it can be a something for all of us to look out for and everyone to take a part in. Whether it is through donations, or college trips to local farms, we can all be aware and offer help towards the answers. Tourists to the country are obligated to abide by environmental protection rules the same as those who live in Kenya. Once issues and solutions are more widespread, there will be a greater chance for a greater change in better agriculture.

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