The Degradation of Natural Resources in Kenya
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Kenya is a country on the coast of the Indian Ocean. Centered over the equator the coastal area is a hot, humid tropical region. The majority of the country has wide-open plains with poor soils. These regions typically have a dry climate. Kenya's population is 33,260,000 with an area of 224,081 square miles. The official language is English, but the national language is Swahili. Thirty-six percent of Kenyans live in urban areas with Mombasa and Nairobi being the two largest cities. Nairobi is also the nation's capital.

Kenya is a republic with elections and a structure similar to the United States. Kenya only has two branches of government. The people elect the president and 210 members of the assembly. The president then appoints twelve more members to fill the 222-member parliament in Kenya. The president also has a cabinet similar to the United States. Each cabinet member is called a minister. The twenty ministers each lead an executive department of the government.

Kenya is making efforts in industries such as tourism and industrialization to break the country's reliance on agriculture. However, the population is growing rapidly and feeding this population is a great challenge (Commins, Stephen). With recent lengthy droughts all industries have suffered. With no waterturning hydroelectric power plants, power shortages have begun. Food shortages on the coast where fish farming is prominent and throughout the country where water is scarce are making dehydrated cattle and devastated crops a horrible problem. These droughts have cost the country eight percent of its GDP.

With 80% of the population of Kenya being employed by agriculture, agriculture is still the foundation to Kenya's economy and well-being. However, with the degradation of natural resources and water scarcity Kenya's well-being is threatened. Subsistence farmers must confront degradation of resources head on. This misuse of resources threatens not only productivity but also their very livelihood. By creating a sustainable agriculture environment it will not only boost their standard of living but also insure that there is always a place for agriculture in Kenya. Continuation of research and extension is a major role of the Kenyan government..

There have been 1200 people killed, and 350,000 people displaced from their homes, but violence was not the only outcome of a December 27 election. Ever since the election, prices on almost all goods have gone up. Subsistence is becoming the "norm" in Kenya in both the rural and urban setting (Wadhams, Nick). Subsistence in the rural setting includes farmers raising corn, beans, and sorghum. These crops are produced as a food crop for a farmer and his family. Subsistence farmers farm 1.5 to 50 acres. Cash crops include coffee and sugar (Kenyan Food). Subsistence agriculture is not limited to crops. The Maasai that live in south Kenya and parts of Tanzania herd goats and cattle. They depend solely on the livestock that they raise (Kenya).

Subsistence stretches far beyond the borders of farms and fields. It stakes a claim in almost all cities in Kenya. One half of the Kenyan population tries to survive on only a dollar a day (Wadhams, Nick). In 2007 the World Bank classified 41 percent of Kenyans as malnourished, and at least 34 percent small for their age.

Many producers in Kenya are feeling the affects of the degradation of resources in Kenya. For example Nyaga, a producer of maize stated that this year she might not be able to even harvest two 90 kg bags. She went on to state "Normally, I get up to 20 bags"! (Pigeon Peas) Livestock is also affected by the drought. Many cattle in Kenya's Rift valley are dying (Bevege, Alison). If Kenya is to survive this time of drought they must adapt their practices to the challenges of water scarcity.

Sustainable practices can help improve the economic and agricultural situation in Kenya. Based off a study conducted by the Kenya Agricultural Research Institute, yields of plots with conservation practices were anywhere from 12.1 to 23.1 percent higher than their neighboring plots that did not have any conservative methods in place. Treatments included fanya juu terraces, Napier grass strip, and Calliandra calothyrsus hedgerows (Mwangi et al.).

Other conservative practices include tied ridges and conservation tillage. This first practice is a practice that some farmers in drought areas are already using in Africa. Tied ridges help prevent surface run-off and because of damming in the furrows, the ridges can even trap water and give more time for rain water to infiltrate into the soil. Tied ridges are a great technique for underdeveloped countries because they can be created even with a shovel. With great success in West Africa yields have increased up to 40% with maize.

Conservation tillage is a simple farming practice widely accepted by American producers and could have outstanding results in Kenya. With reduced tillage of the soil this practice increases organic matter. Organic matter is crucial for healthy soil. Low organic matter in the soil creates a need for more inputs. Studies in the United States, specifically Michigan, show that for every one percent increase in organic matter, can increase yields up to 12 percent. For every year no-till practices are used two to four inches of soil moisture can be conserved (Magdoff, Es).

Improving the soil for better yields is one aspect of conservation measures but Kenyan producers should also focus conservation methods to meet the challenges of water scarcity. Water harvesting in the fields include the fanya juu terrace and catchment systems. A fanya juu terrace channel is .6 m deep by .6 m wide. With fanya juu ridge on one side directing the water in to the channel, the channel acts as a retention ditch. Catchment systems are usually on a slope. They stop water run off and direct it into cultivated areas.

Many systems for storing water are being implemented in all parts of Kenya. These systems are in dire need in arid, and sub arid areas. For example, 50 percent of livestock production in Kenya is in arid areas (Ministry of Ag). The Maasai once sold cattle for $374. They now are selling them for just the price of their skins. These cattle are so starved that the slaughterhouses will not even process them. They sell them at a measly 12 cents (Bevege, Alison). With implementation of pitting livestock survivability increases due to not only more access to water but also increased forage supplies. Dams are also a water harvesting method that should be further pursued in Kenya. Harvesting water in an urban setting is also very important. Roof catchments are another sustainable way to harvest water.

These conservation practices are not enough to create a sustainable agricultural industry. In crop production, producers should be mindful of the crops they plant. One choice is drought tolerant sorghum. In 1983 Dr. Ejeta released a hybrid named Hageen Dura-1. In trials this hybrid increased yields by 50-100 percent. Farmers across Africa that are already using the hybrid say their yields have increased up to 150 percent.

Another choice is pigeon peas. They are already grown on about 196,261 ha of land in Kenya. The International Crops Research Institute is giving free seeds to farmers. They state that a producer can harvest 1500 kg per ha. However only 20 percent of Kenyan farmers are planting pigeon peas. They are very high in protein (Pigeon Peas). They can help combat malnourishment. Pigeon peas are sustainable because they can be fed to livestock and stems can be used for fuel. Pigeon peas are a nitrogen fixer so planting them with corn can reduce fertilizer input cost (Pigeon Peas).

In an interview with Richard Jones, the eastern and southern Africa International Crops Research Institute for the Semi-Arid Tropics assistant director, he stated "Often, information does not move well, It is like lighting a fire, it burns, then it goes out; you have to keep lighting many smaller fires (Pigeon Peas)." There is a great need for improved extension in Kenya.

"Knowledge might be power, but it is also the key to survival."-Louis L'Amour

Louis L'Amour said it best "that knowledge is the key to survival." To get knowledge to producers the Kenyan government should countinue to build its extension network. Extension is a free service that puts research-based knowledge to work to improve the quality of life (Comer et al.). Extension is a coperation between educatonal institutions and a network of professionals working in the agriculture field.

Both educational institutions and farmers would benefit from a strong extesion network. Extension resieves research based information and the colledges receive feedback from producers implementing the research. A strong network of extension agents working in the field, work as middlemen between producers and colledges. These agents help match the right recommendations to meet the producers needs. How ever research is useless if it is not put into practice.

Kenya's well-being will suffer if the degradation of natural resources continue. Natural and man-made issues have caused the price of food to go up and the availability of that food to go down. Subsistence is becoming the "norm" in Kenya. The subsistence lifestyle is leading to hunger and malnourishment, with the World Bank stating 41 percent of all Kenyans are malnourished. Subsistence can be seen in all cities, up and down the coast and through out the vast plains.

Yields are down and input costs are up. These are just some of the effects of years of flooding followed by years of drought. Subsistence farmers can narrow the gap between the peaks and valleys of these natural cycles by implementing conservation practices. The main goal of these practices is to build better soils. Better soils utilize water more efficiently. To build better soils producers have to increase organic matter. For every one percent organic matter increase yields increase by up to 12 percent. These practices include; tied ridges, conservation tillage, fanya juu terraces, Napier grass strip, and Calliandra calothyrsus hedgerows. Studies from the Kenya Agricultural Research Institute show that these practices can increase yield up to even 23.1 percent.

Water harvesting will also play an important role in creating a sustainable environment in Kenya. In areas where wells are in place 65,000 m^3 of water is pumped each day lowering the water tables and adding 366 million dollars in additional cost. Water that is caught by natural rainfall is water that doesn't have to be pumped.

Planting crops that are better suited for arid lands will also increase yields and better the lives of Kenyan farmers and city dwellers that will benefit from increased food production. Pigeon peas for example could bring in 1500 kg per ha in a time where some producers are worried about getting just two 90 kg bags on the ground they farm.

If Kenyan farmers adapt their farming practices to meet the current challenges, Kenya's well-being will prevail.

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