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### **Kenya: Creating Community Irrigation to Combat Drought and Water Scarcity**

Kenya is a picturesque country in southeastern Africa bordered by Somalia to the Northeast, Ethiopia to the North, Sudan to the Northwest, Uganda to the West, and Tanzania to the South. The Indian Ocean lies to the East. There are approximately 40 million people living in Kenya, and of those 40 million people, over 70% live in rural areas and about 75% work in the agriculture sector. The capital city is Nairobi, and more the 5% of the population lives in this city. Other major cities include Nakuru, Mombasa, and Eldoret. Kenya is a very beautiful country with many national parks and wildlife reserves. ("Kenya")

Citizens living in the urban areas of Kenya have access to better jobs, modern conveniences, and a higher standard of living. However, the majority of people living in the rural areas experience hardships on a daily basis. A typical family in Kenya has about five members, and the average yearly income for that family is around \$270. (Gitu ) When compared to the United States where the average family size is only 2.6 members and the average family income is \$65,000, one can see that poverty is prevalent for many Kenyans. ("Income")

The country of Kenya is relatively poor, and this trait is reflected in human services available to the people. The average life expectancy in Kenya is about 50 years. Roughly \$6.20 is spent per person every year in Kenya on healthcare. The world healthcare organization recommends that countries spend at least \$34 dollars per year. Kenya is, therefore, well behind the recommended level. In recent years, Kenya's education system has been improved drastically. Most students, regardless of sex, can attend primary school for free. Class sizes are becoming more manageable, and more students are attending secondary schools. ("Allianza")

The main staple foods for Kenyans are corn, beans, and potatoes. Many dishes also contain meat, but diet varies with each culture and region. Another common part of their diets included fruit and fish, but that is also dependent on the location. Crops grown by small subsistence farmers reflect their diets. Corn, millet, sweet potatoes and fruit are primarily grown; however, two of the most popular cash crops grown in Kenya by small farmers are tea and coffee. Crops grown typically vary with location of the farm. If the farm is located in low-lying areas, one would find pineapple, coconuts, cotton, or corn. Highland farms grow coffee, tea, corn, or wheat.

Many barriers restrict food security in this nation. These barriers are holding Kenya back as a Third World Nation. If these barriers could be overcome, the people of Kenya would gain food security and live longer, more substantial lives that would defy poverty. The following factors affect the food supply and are key to raising the standard of living.

Farms in Kenya use hand labor to grow their crops. They use tools, such as hoes, to do most of their work, mainly planting and cultivating weeds. These practices restrict growth of small farms, hindering efficiencies and food security. Without the ability to grow the farm, the chance of improving the standard of living is minimal.

Population growth is another element that is causing food insecurity in Kenya. In a nation where food availability and distribution is already lacking and cannot provide for the existing population, population growth at Kenya's rate of 2.6% is making it more difficult to feed all the people. This rate is one of the highest in the world. Even if agriculture practices are improved, it is still highly unlikely the food supplies will increase by 2.6% per year. Population growth needs to be curbed in Kenya in order for better food security.

Food aid is considered a blessing by many in Kenya, but it is an unrealistic method and will not help United Nations reach their Millennium Development Goals (MDGs). Since one of the MDGs' main targets is to improve food security, the people of Kenya need to become self-sufficient in order to escape poverty. Currently, the abundance of free food in Kenya is making independence even more difficult. Instead of teaching self-reliability, it is, instead, making them dependent on this aid. Some Kenyans find that they can get aid without doing anything. This counter-productive aid does not help Kenya build a future that includes food security. Also, in areas where aid is not necessarily needed, free food easily becomes a smarter choice for many citizens when trying to feed their families. However, this is unfair competition to local farmers, driving them further into poverty and creating a cycle that is difficult to overcome. If the farmer can no longer sell his products, he can not make any money, which in turn hurts the businesses and employees of the business. People who work in the business sector can no longer afford to buy food on their own and now must rely on this free aid. ("American Jewish World Service")

Crime is another problem in Kenya. Crime appears in all parts of Kenya and is very evident in larger cities. People who do not feel that they earn sufficient wages tend to steal, rob, or murder in order to care for their families. Also, there is deep resentment against Western people and interests, making it difficult to give foreign aid. (STANFORD)

The unemployment rate in Kenya hovers around 40 percent. This is one of the greatest hindrances to the advancements of the Kenyan economy. Even though 60 percent of the population does have full time jobs, many of these jobs are low paying. The lack of reliable jobs makes it difficult for people to feed their families, hampering food security by limiting sales and income to farmers. If higher paying jobs would be provided, food security, along with a decrease of crime, would be achievable. (STANFORD)

Kenyan farmers could have a perfect season and raise bumper crops, but that would be in vain if the farmers access to markets is restricted. All over the world, crops are allowed to rot in fields because there is no way to get the crop to an area where they can be marketed. This is clearly a hindrance to food security in Kenya. Roads are often found in poor conditions and methods of transportation generally restrict farmers from traveling more than a few miles. Even though small farms are less efficient than the larger farms, they are still critical to this nation's food supply and need to gain better access to markets. (STANFORD)

The age old adage goes like this: "Give a fish to a man and he will eat for a day. Teach a man to fish and he will eat forever." This saying can be related to farming in Kenya. Kenyan farmers lack basic knowledge and do not understand that certain crops grow better in different climates and soil types. If they could better understand these facts, more crops could be grown. Along with learning soil types, Kenyan farmers could also learn to better utilize natural and artificial fertilizers to help improve soil quality for the type of crop grown. The use of fertilizers could drastically improve yield. An agency needs to be implemented in Kenya, educating farmers about all aspects of farming, including crops, soils,

irrigation, and business issues. A good model for this agency would be the Extension Services offered across America.

One of the major barriers is drought. The climate in Kenya at times makes it difficult to have consistent crops year in and year out. Much of the country experiences a rainy season and a season without much rain. Irrigation is not readily widespread throughout the nation. Farmers that periodically experience drought suffer through these times and without foreign or domestic aid would suffer and starve. Kenyans, however, need to work towards using practices that help protect them against drought. They could learn different techniques on how to irrigate and use water wisely. During drought, crime rises, malnutrition increases, and people suffer. In the last ten years, drought cycles in Kenya have increased. Managing water resources is difficult, but if done properly, many issues can be improved in Kenya. (Odula )

Water is essential to life. Without it, many small farmers around the world can not sustain themselves. In Kenya, drought cycles that use to occur every five to ten years are now occurring about every two years. This is having a negative effect on local people. Unable to grow anything, farmers and locals must now rely on aid to survive. Currently, the drought is getting worse in Kenya. A recent story in the Huffington Post reports that along with suffering from malnutrition; up to 14 people perish from starvation each day due partially to drought. The drought is occurring in mainly the northern sections of Kenya, and herds of animals are the worst affected. (Odula ) As a family in Northern Kenya drought is killing off a large portion of our livestock, and it will take years to rebuild the herds of sheep and cattle lost. Cereal grain storage of crops like maize has been used up, and now our people have very few choices on what to eat. Poor herders and farmers are the most seriously disadvantaged, but everyone in the region is feeling the effects of the drought. The situation is made worse by refugees from neighboring Somalia. (Reuters)

There will most likely be no improvements in the climate this year as the drought continues. Food shortages continue and demand increases as refugees flee from tensions and problems in Somalia. The influx of Somali refugees has put a major strain on relief efforts in Kenya. This, along with a recent political election, has created an increase of crime. (Odula ) Something needs to be done in this drought affected areas immediately. One of the things farmers and herders need to do is implement farming practices that use less water. If farmers and herders adapt their current practices to better manage water scarcity, they would be able to help improve their own standard of living and, coincidentally, gain better food security.

In many communities and tribes across Kenya, local pastoral farmers have grazed their herds of livestock across the landscape, but they always have turned to springs and sometimes wells to water these herds. According to an article in Mesha, (the Media for Environment, Science, Health and Agriculture Association in Kenya), only 13 percent of irrigation potential has been reached within Kenya. It also stated that many current irrigation practices are inefficient or wasteful, due to unlined canals that let water seep into the ground. These previously low use springs should be accessed for use as irrigation by laying a system of pipes instead of open canals. Water pipes could carry water longer distances than current methods, therefore reaching more farms. Crops, such as corn, and other high water usage crops should be avoided in these areas, as they are more suited for areas that have consistent rainfall patterns. Instead, growers in these area should focus on boma rhodes grass, which is a high yielding fodder that can be used to help feed livestock that can provide clothing, meat, milk, and even income. Another crop suited well for this climate is the Leucaena tree. Leucaena trees are another example of a crop that requires low water

supplies. The Leucaena tree can be used for animal feed, or its branches can be used to create beds and manyattas, which help house individuals and can create additional income for families. However, with irrigation comes with its own issues. Herders use these springs to water their livestock. If water is diverted from these watering holes, the livestock would suffer for thirst, but currently, much of the water in a spring goes unused. In order to solve this problem, current natural springs should be made more modern, and instead of the water flowing naturally, it should be stored up in tanks and water towers. If areas are drought prone, it would be greatly beneficial to have stored sources of water. Farmers in the area should be taught better irrigation practices, such as drip instead of flood and irrigating in the evening when direct sun would not cause rapid evaporation. Environmental needs also have to be addressed though, but some water can and must be diverted to help ease Kenya's growing problems.

Investments need to be made by local governments or communities to improve current water infrastructure. Assistance from other areas, including foreign aid, should be used to speed up the process. It is important that the people of Kenya support themselves, and after they gain the initial success and prosperity, it should fall upon themselves to maintain and expand water infrastructure for future generations. Currently the government of Kenya has set up 15 regional boards. However, they cover a broad area and can't always effectively manage resources. Instead, a local board should be made to enforce water conservation, made up of knowledgeable locals. The local board needs both backing from the national government as well as support from local tribes and communities. Small loans, provided by outside organizations or government agencies, could be given to farmers to help fund efficient and cost-effective systems for irrigation. Private investors could also lend money to help spur development. After all, many of the farms are small and wouldn't require large pipes to deliver the needed amounts of water per farm. Even a small amount of water could be the difference between a nutritious meal and starvation.

If community-sponsored water supply and irrigation would become feasible, Kenyans would gain the opportunity to be self-reliant. They could begin to feed themselves and others and ultimately gain food security. With food security, crime and other problems within Kenya could be eased and controlled.

There is no blinking at the fact that food security is a major issue around the world and is extremely relevant within the country of Kenya. People are suffering and dying every day in this poor country that has the potential to sustainably feed itself. Through proven methods of irrigation, and economic backing from both foreign and domestic sources, Kenya would have the ability to gain food security. It is essential that something needs to be done to help Kenya reach the (MDGs). Despite the many issues within Kenya that are limiting food security, there is a dream of a meal on the table every day. That dream needs help by all of us in order to be a reality.

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