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### **Solving Food Insecurity Through Education in Kenya**

"Hungry farmers should be an oxymoron" (Thurow, 2012, p. xii). Imagine you live on a farm that does not produce enough food for your family's needs. Your only source of income is from selling the milk produced by your cow. The small amount of money from the milk is divided between buying food for your family and paying school fees for your children. For you, putting your children through school is just as important as putting food on the table. At the beginning of the year, you sold your entire maize harvest (which could have fed your family for a whole year) to raise money to pay for the high school tuition of your fourth child. Imagine watching your youngest daughter cry for food, but you have nothing to give her. You are then forced to watch the cruel reality of your daughter shrinking into a severe stage of malnutrition. This is the everyday life of a woman named Leonida Wanyama (Thurow, 2012). Leonida is a 43-year-old farmer and village elder from the Lutacho village in western Kenya. Leonida strongly believes education will lead her family out of poverty, and I strongly agree with her. Education is a natural human right, granted to you at birth. Poverty should never stand in the way of anyone, when trying to receive a quality education. No one in the world deserves to be hungry, and with education we can fix this major problem.

Kenya is a country located in eastern Africa. A rural Kenyan farm family usually consists of a mother, father, and four children (Kenya National Bureau, 2010). Throughout the year, this Kenyan farm family will harvest and eat their own maize, beans, meat, vegetables, and fruit. (AFS, 2015). It would be unlikely for a rural family's children all to go to school for a quality education, considering the price and the percentage of success. Since 1966, every Kenyan family has had access to public healthcare, but still only 20% actually have some (The World Bank, 2014). This rural farm family would probably not have any type of medical coverage/healthcare because of the high cost. This typical Kenyan family would own one to two acres of land (Acumen, 2015). Maize is the staple food of Kenya, so this almost guarantees this farm family would be growing their own maize (Kaveri-Mbote, 2005). The lack of knowledge and extension services in Kenya makes it difficult for the rural farmers to learn modern agricultural practices. This Kenyan farm family made be beginning to become exposed to the matter of crop rotation. They also may be learning about irrigation in order to increase their yields (Foodtank, 2014). A rural Kenyan farm family would be faced with my barriers and challenges throughout a year. Some barriers include climate change, extension services, use of outdated technology, pests and diseases, use of inputs, soil nutrient deterioration, and poor infrastructure (IEASIC, 2001). Climate change has been a problem in Kenyan rain-fed agriculture because rainy seasons are becoming unpredictable, and this is making it hard on the farmers. In Kenya, there is a lack of extension services. These services are supposed to transform agriculture, reduce poverty, increase income, and link rural farmers to the economy. Rural farmers are using outdated technology, which is now becoming ineffective in agricultural productivity. Part of this particular problem is the lack of extension services linking farmers to more modern research. Pests and diseases have also been a long time problem in Kenyan farms. These rural farmers lack knowledge and exposure of the subject on how to handle and control pests and diseases from killing their crops. Many rural farm families in Kenya cannot afford the right type of seed, equipment, or fertilizer because of the high cost. This lack of resources dramatically decreases their yields. Many farmers in Kenya have depleted the soil of its nutrients through continuous cultivation. Farmers again lack the knowledge of good farming practices that sustain the soils nutrients. Another barrier Kenyans face is poor infrastructure. The country of Kenya has very poor roads for transportation. This leads to a huge loss to farmers, when their food spoils during the process of transportation from farm to market (IEASIC, 2001).

All of these barriers and challenges can be overcome with one solution: education. The most efficient way of distinguishing poverty is investing in education (Global Partnership for Education, 2015). Education gives people the opportunity to lift themselves and their families out of poverty. Benefits of education include peaceful voice, gender equity, improved health, innovation, economic growth, and higher wages (AAF, 2013). Going to school and receiving an education can help protect children from diseases located in poor communities and villages (Schools for Africa, 2012). The meal children receive at school is usually the only meal they eat all day. Education decreases the chance of children becoming victims of abuse and violence (Schools for Africa, 2012). Children with an education are more likely to help their families and communities once they grow up (Schools for Africa, 2012). Parents, who do not see education as an important part of life, are less likely to send their children to school especially if there is farm work for them to do instead (Crabtree, 2013). Africa is concerned with the type of education they can provide their people (Crabtree, 2013).

Lack of education causes farmers not to produce enough food because they don't know modern agricultural practices, modern technology, or how to control pests and diseases (IEASIC, 2015). Kenyan farmers are undereducated with modern agricultural practices, so they still use the practice monoculture. With education, they will learn this practice depletes the soil of its nutrients, therefore decreasing their yields. They will learn crop rotation is a much better alternative. The spacing between the seeds when planting is also another important agricultural practice they are not fully aware of. When putting the seeds closer together, farmers will be able to dramatically increase their yield per acre. Fertilizer rate is a modern agricultural practice that strives to provide each seed with the adequate nourishment. This also helps increase the farmer's yield per acre. Another agricultural practice farmers may be uninformed about is the topic of irrigation. With the unpredictable climate change, irrigation can drastically save crops from drought and increase yields for farmers. Modern technology is also a subject many Kenyan farmers are undereducated in. They do not know or fully understand the different types and varieties of hybrid seeds, equipment, fertilizers, herbicides, and pesticides they can use on their fields and crops. Many farmers do not know there are many different varieties of hybrid seeds that are specifically bred to withstand certain conditions. Another topic that is commonly unfamiliar with farmers is how to control pests and diseases. Kenyan farmers lack the education of the use of pesticides and crop rotation to get rid of pests and diseases.

Education in Kenya is starting to have a brighter future. The percentages of literacy rate, school enrollment, and gender equity in Kenya are improving. These measurements indicate the situation of education is improving significantly. The situation for rural farm families is improving considering primary school is free, and there are much more educational opportunities for the rural families. Improving education by increasing the farmer's knowledge of agricultural practices such as crop rotation, seed spacing, and planting time can significantly increase their yields. The more food a farmer can produce, the more income they will receive. Improving a farmer's knowledge about inputs such as seed variety, chemical spray, and equipment will help maximize the yield of a farmer's field. We can sustain the environment by educating rural Kenyan farmers about crop rotation, in order to preserve the soil's nutrients. Another environment sustainability practice is not continuously tilling the soil to prevent erosion. Education can link farmers to the economy, and in turn this boosts the country's economy. Most rural Kenyan farmers are in poverty, so educating them will increase their yield per acre and their income in order to bring them out of poverty. Education will benefit everyone involved including women, rural farmers, and urban residents. Education will never have a negative impact; it will only make the country of Kenya stronger. Major issues such as population growth, climate volatility, and pollution will affect education by testing its schools building capacity and the knowledge of its people. It will test the rural Kenyan farmers' knowledge about agriculture and force them to make educated decisions toward their family's future.

The majority of people who live in Kenya are rural farmers. Over 80% of the Kenyan population, especially those living in rural areas, make their livings mainly from agricultural related activities (KARI,

2012). Due to these reasons, the Government of Kenya (GoK) has continued to allow agriculture to have a high priority in national development (KARI, 2012). All though such a high percentage of people are farmers, this does not mean these families are in good food and financial standings. In 2012, a survey conducted by CCAFS revealed no more than 2% of Kenyan households are 'food secure' all year long, and only 1% had enough food to feed their families for at least 10 months of the year (Atakos, 2015). This means 97% of the households struggled to get enough food to feed their family for more than 2 months out of a year (Atakos, 2015).

My solution to solve food insecurity through education in Kenya is by implementing a loan service to rural farmers. The goal of my service would be to supply the farmers with materials and education in order to fully maximize their yield potential and start them on the road to a successful life. The outline of my loan service has four major steps. The first step is to network to the farmers of Kenya and have them agree to use my service. To do this I would travel to villages in Kenya and simply talk to farmers and show them the advantages of my service. Advantages of my service are free educational courses, face-to-face delivery, and a guarantee to a successful outcome that brings families out of poverty. The next step would be to distribute the seed and fertilizer to the farmers. The seed and fertilizer would be delivered to each community to ensure farmers would not have to travel far distances to receive their supplies. I would choose to use the Kenya Agricultural Research Institute (KARI) Delkab maize varieties. These varieties seem to be the best option because of the extensive eight-year development of the seed (Farmbizafrica, 2015). They take up less space, are drought tolerant, and pest resistant, but the most important aspect that stood out was the fact that they were Grey leaf spot, Maize Streak Virus, and Turicum blight resistant (Farmbizafrica, 2015). When these three infections start affecting a field, they can reduce yields by 50%, which would be a major catastrophe to Kenyan farmers (Farmbizafrica, 2015). The third step for my solution is educational classes, which are required for the rural farmers who accept my service. These classes would be every week for one hour after each Sunday worship service. This time range would be the best option because of the long distances these Kenyan farmers travel just to get to the church. Setting a time other than a Sunday morning could potentially draw customers away due to the hassle and inefficient timing. In these classes, farmers would learn basic, modern farming practices and technology that is not currently available to them. Some of these practices would be as simple as showing them how important it is to pull weeds in their fields because if they don't, the weeds hold the maize plant down from growing to its full height and decreasing their yields. Some necessary and more complex techniques include crop rotation, intercropping, optimum spacing, use of terraces, water harvesting, micro-irrigation, improved processing and storage, integrated pest management, and composting. The next step would be to assist the farmers in selling their maize. If the rural farmers follow all of the educational teaches, their yields should double which is huge. This means farmers will have enough maize to sell some when prices are high, pay back the loan they received, and have enough maize to feed their families for a whole year. Providing this knowledge and assistance to the Kenyan farmers would drastically increase yields and income to improve the country's food security tremendously. My solution will allow parents to make a greater income, which in turn can potentially send their children to school. As studies have shown, once these children finish schooling, they have a much higher chance of being able to help lift their families out of poverty. The net profit for farmers using my solution would be much more than the profit of previous years. The end goal would be for rural farmers to eventually not need the service anymore and become a self-sustaining operation.

The success of overcoming food insecurity takes support from multiple groups. The community, national government, organizations, and international governments must work together in order to combat this challenge. For my solution to work, the many communities in Kenya are going to need to have their full support into this idea. They need to believe this is the way they will lift themselves out of poverty and into a promising future. They need hope. Communities within Kenya need to be able to communicate with each other to ensure the maximum success of ending food insecurity. The number one service a

national government can do is support its people and their decisions. It is hard for people of a country to advance forward if its government does not stand behind them.

Many different groups of people are already trying to help out Kenyan farmers including communities, their national government, and international governments. One community in Kenya is already doing that. In the Kikumini village located in Eastern Africa, over 450 rural farmers joined together for the annual Wote Training (Atakos, 2015). This particular training is to teach farmers about climate-smart agricultural techniques (Atakos, 2015). These farmers live in a dry area where drought, severe erosion, and low fertility of soil is a common struggle, which is why this training is so crucial to their agricultural success (Atakos, 2015). This community has shown success does not need to come from large national governments, but from their own backyards. Local Kenyan communities are not the only ones trying to make a difference. In 2008, the Government of Kenya (GoK) introduced a long-term development called Kenya Vision 2030 (KARI, 2012). GoK defines food security as "a situation in which all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (KARI, 2012, para. 4). The goal of Kenya Vision 2030 is to grow Kenya to a middle-income country and ensure all of its people live in a safe and secure environment (KARI, 2012). To accomplish this goal, GoK developed a seven step plan as follows, "agricultural policy reforms, three-tiered fertilizer cost reduction, branding Kenya farm produce, establishment of livestock disease free zones and processing facilities, creation of publicly accessible land registries, development of agricultural land use master plan, and development of irrigation schemes" (KARI, 2012, para. 10). Kenya is not only receiving help from their own government, but they are also obtaining help from multiple international governments. Kenya is the major focus of the U.S. government's global hunger and food security initiative, feed the Future (USAID, 2015, para. 3). Feed the Future has helped 485,000 rural Kenyan farmers implement management practices and modern technologies on more than 15,000 hectares of land (Feed the future, 2015). U.S. Government nutrition programs have also reached out to 2.2 million Kenyan children under the age of 5 years old (Feed the future, 2015). The United States of America is not the only country helping Kenya out. The Embassy of the Kingdom of the Netherlands deals with the cooperation of rural farmers to ensure food insecurity in Kenya (Food security, n.d.). The goal of the Embassy is to improve food security, employment, and rural farm income throughout Northern Kenya (Food security, n.d.).

Organizations are also an important part in ending food insecurity. An organization that is currently implemented and working in Kenya is the One Acre Fund. Their views of solving food insecurity are very similar to my own personal opinions. We need to empower farmers with education, so they can solve their own problems (Thurow, 2012). Andrew Youn, the founder of One Acre Fund, made a key point when saying, "Our secret business ingredient is distribution" (Thurow, 2012, p. 44). The purpose of One Acre Fund is "We serve small-scale farmers. In everything we do, we place the farmer first. We measure success in our ability to make more farmers more prosperous" (One Acre Fund, 2015). This organization has had success in multiple different aspects. One of these ways is how they have networked out throughout Africa. They currently serve in four countries and have helped over 300,000 poor, rural farm families (One Acre Fund, 2015). One thing they also emphasize to farmers that has made their organization a success is to simply share. When farm families have enough food for themselves, they encourage everyone to share, in order to lift the whole community out of poverty and not just themselves (One Acre Fund, 2015).

Why are the rural farmers who devote their entire lives to farming starving? Education is the root to solving the major issue of food insecurity throughout the world. How to solve food insecurity in Kenya has become a very important problem for this country. With education, food security problems will be solved, and people will eat. Educating the people of Kenya on how to grow their own food is essential. There is a huge difference in giving someone food, and making them work to grow their own food. Similar to objects in our lives, the food farmers in Kenya harvest themselves will mean a lot more than

food simply given to them. Education is the root to solving every type of challenge. No one in the world should be hungry, and with education we can fix this major problem. Education gives a family the opportunity to lift themselves and their families out of poverty. Although education in Kenya is improving, it is still not enough. The concept is very simple; lack of education has caused farmers not to produce enough food. If we can implement a solution such as providing the farmers with modern knowledge, seed, and fertilizer we can overcome food insecurity. Through education and the help of the world, we can end hunger not only in Kenya but also throughout the rest of the world. With education, food security problems will be solved, and people will eat. Educating the people of Kenya on how to grow their own food is essential. I believe we can all learn a valuable lesson from Norman Borlaug's granddad, Nels Borlaug, when he said, "Fill your head now to fill your belly later" (Vietmeyer, 2008, p. 36).

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