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Kenya, Spoilage and Waste

## **Kenya: We Must All Pull Together**

Kenya is a small, hilly country located in Eastern Africa. With such diverse geography in such a small country, however, it stands out from other countries throughout Africa. The highlands in the north are bisected by the Great Rift Valley, which runs through all of Kenya. In the valley, there are active, volatile volcanoes and hot springs. Deserts border the north, while numerous lakes are scattered throughout the country. (worldatlas.com, n.d.) Kenya is a land full of rich culture and varied agricultural commodities, yet due to poor storage methods, a land rife with waste of those same commodities.

### **1. Kenyan Living**

According to FeedtheFuture.gov, the current population of Kenya as of 2016 is 48.5 million people. (FeedtheFuture.gov, 2016) Over half the population lives below the poverty line, making less than \$2 a day. (FeedtheFuture.gov, n.d.) The average yearly income is around \$840. Much of the population has access to health care, but the services provided are not enough to meet Kenyan's needs. In 2003, the government proposed free primary education for all, but as of now, only 70% of Kenya's population is literate, and Kenya is ranked 65 out of 110 countries for education. (UNICEF, 2003)

The average Kenyan family consists of 3 children and both parents living in either a rural hut or a one-room shanty in city slums. However, not all children are given the blessing of both parents. According to the non-profit organization Orphans of Kenya, around 2.5 million children are orphaned due to AIDS, which 1,000 people die from every day. (orphansofkenya.org, 2012) The few families who have a suitable income can afford a two-bedroom house with running water. Most homes have no electricity or running water. In urban areas, the only toilets available are either the streets or public latrines, which over 500 people use daily. Two-thirds of Kenya's 26% urban population consists of those living in slums, while 74% consists of rural families. (FeedtheFuture.gov, n.d.) Only half of the population has access to clean water, and only 25% of Kenyans receive clean water through their pipes. (voanews.com, 2009) According to Edward Kairu of the development program Maji na Ufanisi, over two-thirds of the water problems can be attributed to government corruption and inefficiencies in the water systems. For example, most middle-class homes in Kenya only receive water 3 or 4 times a week due to the country's water rations. 30% of city water is wasted, especially in the capital of Nairobi. Some water loss is due to poor piping, as most of the pipes are over 50 years old. In more rural areas, most have to walk a long way to water, and most of the water they gather is unclean and full of dirt or parasites. (voanews.com, 2009)

### **2. Setbacks**

Over 80% of Kenya is not suitable for farmland. Northern lands suffer from desert landscapes and extreme drought. Most of Kenya's produce is grown on small family farms, which are less than 1.2 hectares, as opposed to the average of 169 hectares in America. (fao.org, 2005)

The main exports grown are tea, coffee, cabbages, onions, corn, potatoes, and bananas. Other exports also include essential oils, roses, carnations, (which are grown for European countries) and tobacco products. Staple crops mostly include potatoes, corn, and maize, which is usually made into porridge called ugali. (npr.org, 2015)

The Kenyan diet is high in porridges made from lentils or maize, with veggies and the occasional meal of

beef or goat. Diets are highly lacking in zinc, Vitamin A, and iron, and not all children have access to proper nutritious foods. 16% of children under 5 are underweight, and 21% of children are suffering from stunted growth. (usaid.gov, n.d. ) This doesn't just affect children's hunger and physical growth; it also affects their ability to get ahead. Studies have shown that children who are chronically hungry have difficulty paying attention in school and formulating their thoughts.

With high rates of food-insecure families, most children have to drop out of school and help their parents earn money just to get a bit of food on the table, giving up on their dreams of a better life. In addition, although education is available through government programs and non-profit organizations such as WorldVision, Compassion International, and UNICEF, most Kenyans do not see the value in a primary education. Education does not immediately bring in more income, so parents often discourage their children from going to school. They are faced with such a difficult choice- feeding their minds, or feeding their bodies. Taking a child away from school to work on a family farm or some other endeavor to bring in an income may seem short- sighted to those of us in developed countries with perpetually stocked pantries, but this is the reality that marginalized families continually face.

Job scarcity is common in urban areas. Often, families are forced to walk long miles just to earn a few dollars doing odd jobs. Some carry luggage all around the city for tourists, while some perform heavy labor duties. Workers are often exploited and paid next to nothing. Most rural families are employed farmers, but because most of the wheat products they grow are not properly transported or stored, the crops are spoiled or experience some loss. This is due to insect infestation, vermin consumption, or other means due to poorly stored grain. The farmers are forced to sell their produce early at a very low price, reaping no profit and very little money.

### 3. Effects of spoiled wheat products

Roughly 1.3 billion tons of food produced for human consumption is wasted globally. (fao.org, 2011) In more developed countries, food waste is largely due to consumers or produce simply disposing of a product rather than finding a way to preserve or re-use it. In developing countries, however, without proper infrastructures in place and often antiquated grain storage, food waste is more common. Because most Kenyans farmers are living on the cusp of poverty daily, losing even the smallest amount of grain to sell or eat, can be devastating. Sadly, it is estimated that 15-35% of Kenya's food products are wasted annually. (mgafrica.com, 2014)

When people are hungry, they do not often make well thought out or long term decisions. Lack of opportunities and food can make people do things they would not normally do. Those in poverty can choose to do something simply because it offers security or more money to buy food, and do not consider the long-term consequences. These choices can include loans with exorbitant interest rates, businesses dealing with less than scrupulous people, and placing their children at risk for trafficking or other nefarious groups.

For example, the terrorist group Al-Shabab in Somalia recruited young men by paying them \$50 a month and a mobile phone. Though the group has committed innumerable atrocities, they convinced hundreds of young men to join the cause because they offered the things those young men did not have at the time: security, and money. It is very important to not only inform Kenyan citizens of alternative choices, but also take steps to encourage and offer opportunities to generate more income and educate them on products or technology that would aid in their farming. (usaid.gov, 2017) The more the community or individual farmer is involved, the better the chance of success will be, as ultimately the goal is for independence and sustainability, so they no longer face food scarcity.

One solution is the construction of air-tight silos. According to theconversation.com, silos are constructed using galvanized iron and hermetically sealed, meaning that bugs, rodents, and other animals could not

consume it because of the low levels of oxygen. The silos can last for over 10 years, and they come in sizes ranging from 250-1,300 liters. Organizations such as the World Food Program, private businesses, and the Kenyan government are working to grant loans, payments, tax exemptions on sheet metal, and much more to encourage building the silos and aiding in the \$300 cost, which can sometimes be unattainable to a Kenyan farmer who averages \$1000 a year on crop yield after family consumption. Over 150 silos have been constructed in Kenya since their implementation in 2011. Another option is for several farmers to pool their money together and purchase a silo as a group, further uniting them to rise out of food and income insecurity. (theconversation.com, 2015) (theeastafrikan.co.ke, 2017)

Though these types of silos are helpful, the most economical and ready-to-use upon purchase is the Agro-Z bag, which is also called hermetic, Zero Fly bag, and Purdue developed PICS (Purdue Developed Crop Storage). For a long time, economically insecure farmers stored grain in gunny sacks, crates or poorly constructed quasi silos. This left the grain ripe for weevils, rats, fungi and more destructive elements, resulting in food loss. That directly impacted their food intake and their income, neither of which they could afford to have lessened.

However, these numbers, with the advent of the Agro-Z bag, can be greatly reduced. For the last 4 years, programs such as Feed the Future, It Works!, Purdue-Improved Crop Storage, and even the U.S. government, have been working to change the amount of grain wasted. These organizations have paved the way for effective, economically and environmentally friendly grain storage. These hermetically sealed bags are cost-effective, each bag is around 2-3 U.S. dollars, and can be reused for up to three years. The sacks are able to store grains, peas, beans, and corn, staple crops of Kenyans. The bags can hold up to 100 kilograms of dried goods. Because the bags are made of woven polypropylene, a cheap material, and multi-layered, weevils and other harmful pests are unable to penetrate the polypropylene material. The bags are air-tight, so any weevils that may have burrowed into the grain while being bagged, die of dehydration due to lack of water. This effectively curbs the weevil infestation.

The biggest hurdle faced by Agro-Z bag proponents was to get farmers to try them and see the results for themselves. Most were very skeptical, thinking it was not much better than the gunny sacks they and because they were encouraged to not use pesticides which they heavily relied upon. To combat those doubts, the U.S. government launched a six month introductory project in 2013 called "It Works!" to help Kenyan farmers improve storage methods and promote the hermetically sealed bags. Kenyan farmers received 5 Agro-Z bags per family free of charge to get them started so they could receive the immediate benefits. (feedthefuture.gov, 2016)

New storage technologies such as the hermetic storage bags were heavily advertised through radio and television programs, as well as business education. In addition, those involved in the "It Works!" campaign also hosted road shows, village demonstrations, and hermetic storage technologies workshops. Hundreds of farmers responded, but many were still left unaware. With continued efforts of educating farmers through organizations, businesses, and others in the Kenyan communities, families were taught how to properly dry and store the grain. (standardmedia.co.ke, 2017, usaid.org, 2017) As each farmer found success, some, in turn, told other farmers so that other farmers were introduced to the product by Kenyan helping Kenyan. This helped to build community even more.

Hundreds of farmers have since responded, with continued efforts of educating farmers through organizations, businesses, and other farmers. Some Kenyans are able to purchase the sacks at local farmers' markets. This is one of the best ways to help Kenyan farmers improve their knowledge of hermetic storage. By hearing from a nearby neighbor and fellow farmer on the benefits of the sacks, the Kenyan people will be much more likely to invest in the bags.

Another project was started by the Catholic Relief Services (CRS) who were working to change the farmers crop yield as well as lift them out of poverty in neighboring Tanzania. A young woman named Georgina Pius Mbwala first heard about the bags from an organized workshop hosted by the CRS. She

and her husband received two bags at no cost and decided to try them. They stored 200 kgs of maize in the bags, and when they opened the bags three months later, they were thrilled to find that the corn was in excellent condition. It was not infested with weevils or gnawed by rodents. It was then Georgina realized the potential of the PICS bags (Purdue Improved Crop Storage sacks) and purchased 200 to sell at a local farmer's market using all of her life's savings. By promoting them at church, to her neighbors and throughout the community, she was able to sell all of them and purchase more using the profits made from that initial \$300 investment. In three years she sold 5400 bags which encouraged her entrepreneurial spirit. Currently, Mbwala plans to sell over 40,000 PICS sacks. This has encouraged other farmers to use the bags on their own farms. (picsnetwork.org, 2018)

Success like this is slowly growing all over Africa as Purdue University, Catholic Relief Services, the US Government through projects like Feed the Future, and others promote hermetically sealed bags. Though the first benefit is less loss of crops, the benefits grow exponentially as selling them creates an income stream for others. Several bag-opening ceremonies have been held by Purdue University, the Catholic Relief Services, and other African farmers. These ceremonies serve as both an educational and a marketing opportunity, allowing both groups to prosper and become food secure. The hermetic storage bags are now being made and imported in 10 African countries, including Kenya's neighbor Tanzania. (mg.co.za, 2018)

It will take the free market to keep producing these bags, so that they become even more accessible and available. With increased use and purchase of Agro-Z bags, farmers and manufacturers alike will prosper and be lifted out of poverty. Already, the efforts have allowed 4.6 million children to be given proper nutritious food and farmers to generate more than \$800 million in agricultural sales in a year. These bags have also been implemented in targeted countries such as Tanzania, Niger, Ethiopia, Senegal, and Nepal with equal success. (feedthefuture.gov, 2012), (standardmedia.co.ke, 2017)

Kenya's national motto is, "Let us all pull together". (worldatlast.com, n.d.) The implementation of Agro-Z bags through government, private corporations, non-profits and the investment of the farmers themselves epitomizes this motto in the best way possible. If farmers are to see change in incomes and livelihood and no longer experience food insecurity, then Agro-Z bags with world wide support are going to leave a lasting legacy to the future of Kenya and other emerging nations. It seems then, that yes, we can all pull together.

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