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Kenya, Factor #5

Kenya: Keeping Carbon from Starving our World

This fall, three men from Kenya visited our church and stayed in our community for nearly a week. They were returning a visit from one of our church members, a veterinarian, who had, a year ago, gone to Kenya on a missionary trip. In a very emotional way, these three Kenyan men told not only of the beautiful country that was their home, but also of the suffering that so many of their people were experiencing because of a lack of food.

Kenya, sized like Texas, is a diverse country. It straddles the equator and the Great Rift Valley of Africa and has beautiful grasslands, rich cropland, and forests—both rainforest and mountain forests. The countryside is populated by a wide variety of wildlife: elephants, lions, buffalo, rhinos, and leopards ("Destination: Kenya"). Kenya is enriched by the cultures of at least 40 native tribes ("Destination: Kenya"), and it has been the economic center of Eastern Africa, at least until recent drought and subsequent influx of refugees from neighboring countries also stricken with drought have brought Kenya to hard times. According to the United Nations Development Programme's Human Development Index, Kenya is rated128th among 169 countries monitored in "life expectancy, educational attainment, and standard of living" ("Rural Poverty"). Obviously, Kenya is in trouble.

According to a World Bank report, despite all of Kenya's attributes including arable land used for crop rotation and meadows for grazing, a large potential workforce and, as mentioned before, incredible forests ("Arable Land"), poverty is widespread throughout the country. Nearly 79% of the country's population is rural and agrarian, and nearly 50% of the entire population is poor enough to be malnourished ("Rural Poverty"). Of those living an agrarian life, most are subsistence farmers, trying to produce just enough for their own families to survive on. But even those farm families overpopulate what would otherwise be considered farmland with an excellent potential for production ("Rural Poverty").

However, those who live in urban areas are not necessarily better off. The drought has significantly raised the price of food for those who do not grow their own. For example, 2.2 pounds of rice cost a Kenyan 50 cents in December of 2011, but a month later, in January of 2012, that same amount of rice had risen to $1.35, an increase of 270% ("On an Empty"). To compound the problem of adequately feeding the population is the huge influx of 500,000 Somalian refugees who have been crowding into Kenya. Somalia has also been hit by the drought, and that, coupled with political and military unrest, has driven many Somalians into Kenya ("Relief from Famine"). As a consequence, people living in urban Kenya are nearly as likely to be malnourished as those living in the country.

The typical Kenyan family, however, is rural. It is also large, agrarian, and malnourished. According to a study of Kenyan families conducted by Dr. Tabitha W. Kiriti Nganga of the University of Nairobi, the average family has five children of which males are not only preferred but also treated with more respect and given more education because they are perceived to be more useful in earning a living on the family farm which, on average, is only 1 hectare (Place, et al.). The males are also held in more esteem than females because they are the ones who will care for their parents in their old age since the girls are expected to marry, move in with their husband's family and care for their new families. In Kiriti Nganga's study, 65% of the households have both a mother and a father, but of those families, 41% were run by the mother because the father had left to find work in an urban area. Therefore, families are split apart, and the farming is largely done by the women and the children (Kiriti Nganga). Before the drought,

nourishment for these rural families included what they raised on their farms and included fruits, vegetables, and meat in addition to grains, but the lack of rain has killed off livestock, and fruits and vegetables are now scarce. The meals now consist of maize, beans, and flour for porridge ("UNICEF Provides"). Education is not a top priority in rural areas, especially for females, with 22.6% of girls never going to school compared to 9.2% of boys. Only 18.3% of girls and 28.6% of boys enter secondary school (Kiriti Nganga). Health care, while adequate for the rich in the cities, is sporadic in rural areas with only 77% of those who are sick getting health care. Unfortunately, the mortality rate for children under five years is twice that of the rest of the world with 121 out of 1000 dying (Turin). The more optimistic news is that HIV, which is rampant across most of Africa, is, in rural areas of Kenya, only about half the rate at 5.6% as that of the urban population at 10% (Turin).

Making Kenya food-sufficient is a very complex issue dependent on a number of factors including achieving political stability not only in Kenya, but also in neighboring Somalia, teaching Kenyans new farming technologies to make the most of Kenya's soil, especially during a drought, developing new strains of crops that are suited to Kenya's soil and climate, as well as drought resistant, and in the meantime, sending aid in the form of food and medicine while Kenya gets back on its feet again.

There is, however, one other aspect that must not be overlooked. Kenya can help itself by using carbon credits to its benefit.

As mentioned before, Kenya is a nation of forests, or at least it was. The United Nations states that 6.1% of Kenya's area is forested, but it is becoming deforested for a number of reasons ("Kenya Forest Information"). Deforestation is happening due to pressure from over-population and the need to create more land area for farming (Obare and Wangwe). Also, the fact that most cooking is done over open fires has led to the destruction of Kenya's forests; because most water is not safe to drink, it must first be boiled—again, over an open fire (Bells). Between 1990 and 2010, Kenya has lost 6.5% of its forests ("Kenya Forest Information"), causing a deficit in its ability to deal with carbon dioxide. This deficit can cause a change in weather patterns and difficulty in agricultural production. Consequently, it is essential that Kenya reforest wherever possible, and that the country do what it can to make carbon sequestration occur at a safer rate. Utilizing the Kenyan forests wisely will not only help keep carbon gasses in check, but also eliminate erosion and save thousands of Kenyan jobs in forestry ("Kenya Forest Information").

In addition, Kenyan agriculture uses dated technology in agriculture; many fields are plowed black by oxen. When a farmer plows, they expose the organic carbon, which makes the soil look "nice and black" to oxygen and the sun which react with the organic carbon and turn the organic carbon into greenhouse gas carbon dioxide. Plowing, up until the 1950s, released more carbon into the atmosphere than burning fossil fuels (Hofstrand). By using a no till or a low till practice, a farmer can sequester the soil's organic carbon content within the soil and create better soil to grow crops. Not only can farmers use the no tilling method and create better soil for growing crops (Al-Kais et al.), but they can also create carbon credits to sell (Hofstrand).

The release of carbon gas into our atmosphere is not just a Kenyan problem; rather, its influence is worldwide; the concentration of carbon dioxide in our atmosphere has increased noticeably in the last 50 years (Hofstrand). Although most people do not realize that they release carbon on a regular basis, almost everything people do releases carbon ("Carbon Trading"). Most of the carbon dioxide comes from generating power and using fossil fuels followed by manufacturing goods in factories ("Carbon Trading"). One industry that is often not recognized as a pollutant is agriculture. Farm practices, such as plowing, destroy organic carbon by exposing it to weathering. Up into the late 1950s, plowing released more carbon into the atmosphere than burning fossil fuels (Hofstrand). Worldwide, the release of carbon gas into the atmosphere is a cause for concern. In India, the average person releases less than 2 tons of carbon into the atmosphere, and in China, 6 tons per average person is released. The United States,

though, releases 25 tons of carbon per person annually (Nash). Due to this large release of carbon gas which builds up the so-called greenhouse effect, earth has been estimated to warm up 11.5 degrees F in the near future ("The Challenge").

Although, on average, Kenyans only produce .293 tons of carbon dioxide per person annually, they suffer disproportionally from the carbon dioxide released all over the world ("Average Briton"). Many attribute Kenya's most severe drought in six decades to global warming which stems from the release of carbon dioxide. However, even if Kenya is not the cause of global warming, it is in the position to alleviate it.

The most important thing that Kenya can do is to maintain its forests. According to Sassan Saatchi of Caltech, "Kenya's forests contain 476 tons of carbon in its biomass" ("Kenya Forest Information"). Containing the carbon in the soil, also known as "sequestering", keeps the carbon dioxide from joining the other greenhouse gasses in the atmosphere and aggravating the weather patterns that have brought drought and starvation to Kenya.

Help with Kenyan reforestation is sponsored by a group called Carbon Footprint. In order to offset carbon dioxide emissions, to reduce poverty, to provide wildlife habitats, and to give those involved in the plantings something positive to do, Carbon Footprint is providing 30,000 trees indigenous to the Kikuyu forest to be planted over 30 hectares. These trees will sequester tons of carbon and secure the erosion that has been caused by over-foresting. Orphans and people with HIV have been lined up to help with the plantings. The hope is that these people who have had little to be happy about will benefit from having an important job to do ("Kenya Reforestation").

Another interesting project is underway with "Carbon for Water" which hopes to equip Kenyan families without clean water a filter which will clean the water without boiling it over an open fire, using less firewood from the forests and causing less carbon dioxide to enter the atmosphere. The filters are designed to last three years (Bells).

Perhaps the most interesting possibility for Kenya is that it is in an excellent position to sell something known as Carbon Emissions Credits or Carbon Credits.

Carbon Credits are generated from projects that reduce the amount of carbon in the air. The amount of carbon reductions from the project can be converted to carbon credits (Nash). Also in some countries they have carbon credit allowances; if a company produces less carbon than it is allowed, it can sell the surplus as carbon credits. Because many nations govern how much carbon dioxide may be emitted by business and industry, businesses and industries which need to produce more carbon than they are allowed to produce can buy carbon credits to cover the amount of carbon dioxide they produce and keep their business legal. This system provides economic motivation for companies to lower their carbon production ("The Challenge"). Examples of carbon credit sources include creating energy efficiency in industry, using renewable energy, avoiding venting of carbon into the atmosphere, switching to energy efficient fuels, and sequestration of greenhouse gasses (like not plowing agricultural land) (Hofstrand).

Reforesting areas of Kenya will eventually qualify for carbon credits as can rotation crops grown on the ground with a minimum of tillage. As plants grow, they absorb carbon in the process of photosynthesis (Nash). Business and industries can also produce carbon credits in addition to their products. For example, the Kenyan companies, Mumias Sugar which creates energy from the by-products of sugar, and the largest power company in the country, Kenya Electricity Generation Company which gets its power from geothermal and hydropower sources, are examples of industries which can sell the carbon credits they generate (McGregor).

The bottom line from Kenya trading carbon credits is astounding. By registering with the United Nations seventeen businesses which qualify for generating carbon credits, Kenya is in a position to earn 61

million dollars in 2012! (McGregor). This could increase as more Kenyan green industry and agriculture apply for carbon credits to sell. Because the per capita output of carbon is so low in Kenya, the country can reap the rewards from carbon trading. Green businesses and industries which can sell the carbon credits will be able to generate more business and add to the health of Kenya's economy.

What might this mean for poor, malnourished, rural Kenyan families?

If Kenyan agriculture, whether in the fields or in the forests, can sequester carbon dioxide, it can help reduce the greenhouse effect that many think is responsible for the drought in the area. If the drought would stop, it would again be possible to raise livestock, fruits, and vegetables for the family's consumption and for sale. Introducing protein, along with a variety of vitamins and minerals present in a diet rich in fruits and vegetables into this family's diet would create a much healthier and happier family. Babies wouldn't be born underweight, and the mortality among children would decrease dramatically. Being able to grow a variety of crops would also increase the carbon sequestration of the area, and it might be possible for farmers to join together to sell their carbon credits.

If the family farms would again become not only self- sustaining, but also profitable, it is less likely that the fathers of these rural farm families would have to leave in the hope of finding a job in urban areas. These families would then remain intact to raise their children. If raising the crop were not so arduous, then it might not be considered "man's work", so consequently, girls would become as valued as boys among the family.

It is also possible that if farming were not such a difficult ordeal, then education would become more of a priority for both boys and girls. If there were not so much work required to harvest a crop, then there would be more time for children to attend school, and if there were more profit to be gained from the crops, more families could afford an education for their children, giving them the opportunity to find work elsewhere, alleviating some of the pressure of having to feed an ever-growing family on just 1 hectare of land.

Due to reforestation and the sale of carbon credits, more jobs would open up in the fields of forestry and green industry for the next generation of children born on farms. The more successful the family farm, the more likely that family members who are sick will seek medical attention and be able to pay for it.

Granted, paying attention to carbon credits will not solve all of Kenya's problems, but it would be a step in the right direction. It would be a step that would let many Kenyans get from under the excruciating poverty they are currently in and look towards creating a political stability within its own boarders and with neighboring countries, learn new agricultural technologies that are suited to its climate and soil, and grow enough food to feed themselves and those refugees who have come to Kenya in hopes of survival.

Programs like the Carbon Footprint which is planting 30,000 indigenous trees in Kenya and hopes to plant more, or the "Carbon for Water" project which plans on equipping each Kenyan household with a water filter which will eliminate the need for using wood from forests for open fires to boil the water, are very important for helping the Kenyans help themselves. Therefore, I believe that through reforestation, new and improved agricultural practices, and the sale of carbon credits which will generate new green industry, Kenya will be in a position to address its other problems by the year 2015.

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