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Democratic Republic of the Congo, Factor 6: Sustainable Agriculture

Democratic Republic of the Congo: Efficient Land Use to Deplete Protein Deficiency

The distribution of food around the world is extremely uneven. Some countries have too much food and suffer from obesity while other countries lack food and suffer from nutritional deficiency. Both forms of malnutrition are unhealthy. However, it is much easier to fix a problem of “too much” than a problem of “too little.” When a country is faced with a problem of famine, it becomes ostensibly impossible to restore the citizens with nutrition. Large numbers of African countries have been haunted by starvation, protein deficiency, vitamin deficiency and many other malnutrition diseases. These diseases, mostly common in young children, cause families to panic. High population growth rates occur to compensate for the high mortality rates. Large numbers of mouths to feed and small amounts of food cannot satisfy the population, so the country is forced into famine. One such country is the Democratic Republic of the Congo. This large African country, with a population of about 67 million people, has such high potential in the agricultural sector. Due to the good environmental conditions and large population that makes up the workforce, farms could theoretically produce enough food to feed every citizen in the country with a plethora of produce to export. There are two important questions that need to be answered on this topic: how should one farm sustainably and how should the citizens of this large country be taught? The question of farming sustainably is easy; many countries in Africa have learned and lowered their poverty rate astronomically. All the Democratic Republic of the Congo has to do is fight through the final wakes of post war stress, get the support of its government and learn the ways of farming in a way that will boost yield numbers in a frugal way.

Many people in the Democratic Republic of the Congo suffer from starvation. In this country, the “average daily food consumption is estimated at less than 1,500 kilocalories per person, below the minimum of 1,800 per person required to maintain good health” (USAID, 2015). One of the largest issues is the protein and vitamin deficiency in children. Protein is a very important in the human diet. Without it, our bodies are not able to build and repair tissues, bones, muscles, cartilage, skin and blood or make enzymes, hormones, or other bodily chemicals. Marasmus is a protein deficiency disease that affects infants and young children. This disease can develop into starvation due to a lack of essential nutrients. This can also happen in kwashiorkor, which is a more intense protein deficiency disease. Kwashiorkor mostly affects older children, usually ages one to five. Both of these diseases have symptoms of fatigue, irritability, diarrhea, stunted growth and impairment of cognition and mental health. People with marasmus lack muscle tissue and appear very bony, while people with kwashiorkor have an extended abdomen due to retention of fluid and a bony body. These diseases are terrible and terrorize each family in the Democratic Republic of the Congo, especially the children.

In many typical African families, a man will have multiple wives. The goal of these wives is to have many children that reach adulthood so the children will then be able to care for their parents in old age. The children in this country are usually unhealthy and suffer from either marasmus or kwashiorkor. Traditionally, these children learn from their elders from the moment they begin to walk, so there is very little childhood for young males and females in the country’s culture. Male children ordinarily go to an initiation camp away from their village and family for one year to teach the boys to hunt, make handicrafts and perfect their singing and dancing. There are fewer public schools here, however the Catholic Church has several mission schools for the children. Yet, many Africans believe that these schools are wasting precious time for the students learning useless facts instead of inheriting wisdom from their elders. Yes, there are universities in Africa, but only wealthy people can afford to attend these colleges and many students feel cheated of money and services. Lastly, health care is very hard, if not impossible to find. Due to the lack of sanitation of water, current postwar condition and lack

of government support, the health of the citizens of the Democratic Republic of the Congo has been pushed to the back burner. However, due to the increasing problem of AIDS, many education programs have been developed in the country to target and educate the youth on sanitation and healthier ways to live that have been sufficiently successful.

Almost all the families in the Democratic Republic of the Congo must make a living by working and farming whatever land they have. Farms are typically small, the workers or family owning the farm only wanting to produce enough to feed their families and have a small amount of extra to trade or sell. The Democratic Republic of the Congo includes “four million families on plots averaging 1.6 ha (four acres), usually a little larger in Savanna areas than in the rain forest” (Congo, Democratic Republic of the, n.d.). Customarily, women and children dominate the fields, working and doing the chores required to produce food. The agricultural products include fruits, maize, root crops, bananas, palm oil, cassava, quinine, tea, rubber, palm oil, sugar and coffee. Most of the products produced on family farms, or subsistence farms, however, include only rice corn and other similar inexpensive calorie filled foods. Numerous families with these small farms have too many children to feed, which is one of the big reasons for the malnutrition that is taking over the country. The small farms do not use effective enough farming techniques to support their large families. In the Democratic Republic of the Congo, “62 percent of its men and 84 percent of its women” (Agriculture and Food Security, 2015) have jobs working on their family’s farm. This vast majority of the population shows that even though agriculture is not on the country’s list of importance, farming could potentially be the single most important aspect of the country to save the lives of its people. The United States USDA (United States Department of Agriculture) has begun a program called the Beginning Farmer and Rancher Development Program, or BFRDP. This program has funds that will support nongovernmental, community-based and school-based agricultural organizations, address the needs of limited resource beginning farmers or ranchers, and address the needs of veteran farmers and ranchers. The BFRDP also funds three types of projects: standard projects, educational enhancement projects, and curriculum and training clearinghouse. The money being given to these projects will “[ensure] there will be a “new generation” of beginning farmers and ranchers- regardless of age or production choice...” (National Institute of Food and Agriculture, n.d.) If the Democratic Republic of the Congo would facsimile these actions, the country would boost its agricultural income and reduce health problems.

The farming done in the Democratic Republic of the Congo can easily be connected back to the two protein deficiency diseases: marasmus and kwashiorkor. It has been previously assumed that children with kwashiorkor had a diet with a lower intake of protein than that of children with marasmus. Nonetheless, a study done in April of 2015 (Kismul et al, 2015) found that children with kwashiorkor lacked the same amount of protein in their diet as children with marasmus. The difference was children with kwashiorkor also lacked Beta-Carotene. Beta-Carotene is a carotenoid pigment present in some plants and vegetables. This pigment colors the plants a red-orange color and supplies the body with a source of provitamin A. A process located in the duodenum of the small intestine uses Beta-Carotene and an intestinal enzyme- since protein is a building block for enzymes, a protein deficiency results in a lack of β,β -carotene 15,15'-monooxygenase- called β,β -carotene 15,15'-monooxygenase to convert provitamin A into Vitamin A. Incontestably, if any one of these factors is missing, vitamin A would not be produced. Therefore, with a lack of Beta-Carotene and β,β -carotene 15,15'-monooxygenase results in vitamin A deficiency. The good part is, there are many foods that are high in Beta-Carotene. There is one special food item that is high in both Beta-Carotene and protein: an orange sweet potato. In an article called “Saving Lives in Africa with the Humble Sweet Potato” by Dan Charles (2012), the meek beginnings of an incredible idea are described. The article describes a campaign going on in the African countries of Mozambique and Uganda to promote the planting of sweet potatoes in the country in order to decrease the amount of Vitamin A Deficiency. The campaign has recently become a success, and manifold of children have overcome the horrible protein and vitamin A deficiencies.

According to Charles (2012), “scientists gathered evidence from Mozambique and Uganda that these vegetables are, in fact, improving people's lives. Children who are eating them do have more vitamin A in their blood. Based on other studies of the effects of vitamin A, nutritionists are confident that the boost is big enough to improve the health of those children.” The good thing about the nutrient filled orange sweet potatoes is that environmental conditions in the Democratic Republic of the Congo allow sweet potatoes to grow very effectively. The warm and tropical climate will easily support these nutrient filled vegetables. But a perplexing question is: what other foods can help this African country dig its way out of this nutrient deprived and poverty stricken state? Well, the answer could come from right here in America. The United States is currently working on “Super Bananas” that are packed with nutrients such as Vitamin A and Iron. The Bill and Melinda Gates Foundation plans to hold a six week trial period in Texas then have the bananas in Uganda by 2020. According to Hellmann (2014), “Researchers infused the staple crop in Uganda with alpha- and beta- carotene...as an easy solution to the problem that plagues the country...If the bananas are approved...other staple crops in Rwanda, Tanzania and Kenya could also be engineered with micronutrients.” These bananas and sweet potatoes could exponentially decrease the child mortality rate and great number of people who suffer from nutrient deficiency diseases. Now all the country needs is a start in sustainable agriculture education.

The agriculture sector of the Democratic Republic of the Congo has been highly disregarded. “Land under annual or perennial crops constitutes only 3.5% of the total land area” (Congo, Democratic Republic of the, n.d.). The country “has the agricultural potential to feed the whole of Africa” but because the citizens are not educated on sustainable and smart ways of farming, this large potential is not acquired. On the bright side, the land in the large African country is very suited to sustainable crop growth. The land is not prone to droughts, the land is fertile and well supplied with sunlight due to the country being located on the equator, the multiple environments and ecosystems allow the land to produce a variety of crops, and the large amount of people in the country will easily provide enough workforce to revive the once thriving farmlands. There are many different processes and procedures that any typical family living in the Democratic Republic of the Congo can easily perform to boost crop production. In the article “Agricultural Sustainability and Intensive Production Practices,” many examples of nutrient-use efficiency are described. “Multiple cropping systems using crop rotations or intercropping (two or more crops grown simultaneously) may improve pest control and increase nutrient- and water- use efficiently. Agroforestry, in which trees are included in a cropping system, may improve nutrient availability and efficiency of use and may reduce erosion, provide firewood and store carbon. Landscape-scale management holds significant potential for reducing off-site consequences of agriculture. Individual farms, watersheds and regional planning can take advantage of services provided by adjacent natural, semi-natural or restored ecosystems. Trees and shrubs planted in buffer strips surrounding cultivated decrease soil erosion and can take up nutrients that otherwise would enter surface or ground waters.” (Tilman, David, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor, and Stephen Polasky, 2001) In the same article, water-use efficiency, disease and pest control and improving soil fertility methods are described in a sustainable way that will help farmers boost their yield while using less money and a smaller amount of resources. For water-use efficiency, David Tilman, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor and Stephen Polasky (2001) suggest a drip and pivot irrigation system that “can improve water-use efficiency and decrease salinization while maintaining or increasing yields.” A big problem with land used for crops is that the land either becomes stripped of all nutrients in the soil from one plant being planted for too long or the land becomes eroded and hard to farm. “Crop rotation, reduced tillage, cover crops, fallow periods, manuring and balanced application can help maintain and restore soil fertility.” There are very few farms that don not use pesticides or herbicides to rid fields of plant-eating insects and animals. “Insects often evolve resistance to insecticides within a decade...But the need to breed for new disease resistance and to discover new pesticides by crop rotation and the use of spatial or temporal crop diversity.” The article also suggests a multiline- crop genotypes with different disease resistance profiles mixed up in one area- to decrease or eliminate a crop pathogen. If the people of the Democratic Republic of the Congo would follow suit of its African

neighbors like Mozambique and Uganda and learn how to use these sustainable practices-especially when farming orange sweet potatoes- the country could potentially be the strongest economically and most well fed country in Africa.

One problem that the Democratic Republic of the Congo has is that highly cultural areas that rely on their elders for wisdom are not easy to get to change their ways. This is why the people of the community frown upon the school that have become available for the children of the country. Because of these strong cultures, it is harder to change a mind that has been set in its way for many years than it is to change a fresh mind. One program that is already in process is a T.V. show that take place in Kenya. *Shamba Shape Up* is an informational show where a crew travels to different low income homes in Easter Africa and shows families how to use sustainable practices on their farms. This show will allow young farmers to start out already using these strategies beginning a new generation of sustainable farms. Another possible way to get the ideas of sustainable farming to the citizens is by building some free information buildings that are open to anyone that wants to learn about new agricultural practices. In order to bring in fresh minds to the program, there can be specialized classes or tours for children and/or newly married couples or families to encourage starting sustainable practices at a young age. The buildings can also have a small amount of land that use the practices to display to the people as well as bring in money for the program with the yields. However, in order to get something like this started, the government would need to fund it. Government funding for farming in the country would allow for better roads to travel so the crops could be transported easier, allow sustainability ideas to be pushed harder at the people and would help small scale farmers by bringing down the cost of seeds and other supplies. According to the Washington Post, “in 1990, agriculture accounted for about 30 per cent of the gross domestic product and coffee was the second most important export earner generating about \$250 million in foreign receipts. By 1998, agriculture's contribution to export earnings had dropped to \$100 million, while the total value of agricultural imports rose to \$252 million” (Food for Thought, 2011). A different source (FAOSTAT, n.d.) has a very rough estimate of \$850 million in crop imports for the year of 2011. This tells us that the countries government is more focused on buying enough food for its citizens from other countries instead of focusing on sustaining the country’s agricultural field. The Democratic Republic of the Congo’s government needs to realize that the key to saving the lives of thousands, or millions, in the country is agriculture. The United States Aid for International Development (USAID) has recently picked up on this fact, and as of June 19, 2015 “supports the Government of DRC’s strategic planning and coordination role in advancing agriculture in DRC along with establishing agriculture targeted loan guarantee programs providing access to credit for the small and medium-sized Congolese agricultural enterprises. In western DRC, USAID is supporting agriculture sector stakeholders along important value chains and building the foundations for sustainable food security in the Kinshasa area, home to over 10 million people. In eastern DRC, USAID supports the transition from conflict and humanitarian relief programming to development assistance and economic growth.” (USAID, 2015)

Marasmus and kwashiorkor are deadly diseases that cause the child mortality rate to go up by extraordinary numbers. Families, realizing that their children are prone to dying young, have a multitude of children. This multitude of children does not have enough to eat, causing the diseases and continuing the seemingly never ending circle. A fact that many people are oblivious of is that an act as simple as teaching families across any given poverty-stricken country to cultivate and grow orange sweet potatoes could save large numbers of the population. Teaching a country to plant orange sweet potatoes is directly suggested in a popular article (Charles, 2012) and in an academic study (Kismul et al, 2015). In the Democratic Republic of the Congo, despite the large human population, the fertile land has the potential to feed all of Africa. The country will never reach that ultimate sustainability level if the country’s government does not step in and provide the resources and education for all farmers and agriculturalists to learn how to farm efficiently. If other neighboring African countries can escape famine, so can the Democratic Republic of the Congo. All elders, men, women and children are and will continue to be affected by the lack of stable farms in this country. In “Food for Thought” (2011) in The Washington

Post, there is a statement saying that “[The Democratic Republic of the Congo] has greater potential than many of its African neighbors to lift its population out of extreme poverty, but its agriculture sector needs wholesale reform, with the support of the government and the private sector.” The article goes on to say that the country also needs to lift itself out of its postwar condition that has shoved its citizens into poverty; “the country must first find peace.” In order for this peace to be found, the citizens of the Congo must be willing to learn about new sustainable practices and have the assets to use them. If the government would fund a show such as the *Shamba Shape Up* or a network of nonprofit buildings suggested earlier in this paper, the population will thrive. The Democratic Republic of the Congo has amazing potential. The country just needs a push in the right direction.

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