

Brock Vetick
Lyons-Decatur Northeast High School
Lyons, Nebraska
Rwanda, Factor 11: Malnutrition

Growing Rwanda Out of Malnutrition

The people of Rwanda have long been faced with one challenge after another. Rwandans are still facing many challenges today, with problems in agriculture, poverty, food security, malnutrition, and a host of other issues. "Almost certainly, however, the first essential component of social justice is adequate food for all mankind." These are the timeless words of Dr. Norman Borlaug, Founder of the World Food Prize and 1970 Nobel Peace Prize Laureate. Every single person on this planet deserves to have adequate food. It does not matter whether they are rich, poor, young, or old. What matters is the fact that they are human beings. Many people living in a developed country, such as the United States, do not realize the plight of individuals living in third-world and developing countries. The people of Rwanda have been experiencing such difficulties for many years. To add to the problem, the nation faced a large genocide in 1994 during a civil war. Millions were killed, and the country was left in a state of pandemonium. The more fortunate individuals of the world must, as part of their moral duty, help people like those in Rwanda with securing a bright and prosperous future. Rwandans have the right to live in a nation where children do not go to bed hungry.

Subsistence farming is quite prevalent in Rwanda, with 90 percent of the population engaged in such practices ("Rwanda - culture and customs," n.d.). This is quite a large amount when considering the total population of the country is 11.6 million. Subsistence farming is most commonly defined as "farming that produces adequate food and products to support the farmer and their family, often without surplus to be sold or bartered." The typical farm family is composed of three to nine individuals. This includes a mother and father, and up to seven children. A family's diet is most often low in fat and protein, while being very high in starches. Common foods include bananas, bread, potatoes, beans, and fish on some occasions. Meat is eaten very rarely, as it is expensive and animals are not usually raised for meat ("Rwanda - culture and customs," n.d.). Animals are generally raised for products that are able to be consumed or even sold for money, such as milk, cheese, or wool.

As of 2012, 68% of Rwandans 15 years of age and older were literate. This is an almost four percent increase from a study conducted in 2002. ("Rwanda's literacy rate rises," n.d.) However, most people over the age of 15 have only completed primary school, which means that they have not moved on to higher levels of education. In comparison, this would be similar to someone completing school through the sixth grade in the United States. On a different note, many Rwandans have access to health care and health insurance. The nation has a multi-tiered health system, with local, district, provincial, and national medical centers. According to Infographic: Health Care in Rwanda Improves Dramatically (2013), 90.6 percent of Rwandans were enrolled in the national health coverage program in 2013. This is a large amount of the population, ensuring that poverty-stricken families and individuals receive the care they need and deserve.

According to Climate and Agriculture (n.d.), the farmers of Rwanda grow a variety of crops on relatively small plots of land. The average farm size is 0.5 hectares, which is approximately 1.25 acres. The main crops grown for export are high-quality tea and coffee. These two crops account for about 80 percent of Rwanda's agricultural exports. However, much different crops are grown for subsistence. These crops include maize/corn, potatoes, sweet potatoes, cassava, beans, wheat, and bananas. Livestock is also a major part of Rwanda's agriculture. Common livestock include goats, sheep, chickens, pigs, and cattle. However, as previously mentioned, livestock are not necessarily raised for meat, but rather for other products such as milk or wool.

Agricultural practices in Rwanda are both innovative and diverse. The countryside consists mostly of steep slopes that contain acidic soil. It may seem like Rwandan farmers have everything going against them. However, they do not let the land hinder their ability to grow crops and raise livestock (“Climate and Agriculture,” n.d.). Farmers have adapted to the adverse conditions by growing specific crops in groups. This helps to increase soil fertility, reduce erosion, and use less land. Some Rwandan practices of this type are similar to strip cropping in the United States. In addition, flooding is quite prevalent. Therefore, many farmers attempt to use land that is on top of slopes. However, this proves difficult when needing access to water for irrigation.

Livestock practices are considered to be traditional, with various types of animals being raised. As previously mentioned, common livestock include goats, sheep, chickens, pigs, and cattle. Most livestock producers raise livestock and grow crops at the same time. This may seem like the normal way of running an operation in the United States, but it is not as common globally. Cattle and goats are often raised for milk production; however, production is quite low (Kalisa, n.d.). Low production is most commonly caused by poor quality feed. Sheep are raised for both meat and wool production, while chickens are raised for both meat and egg production. Manure produced from all types of animals is used to fertilize gardens and fields.

Rwanda is working diligently to improve agricultural productivity. Farmers are implementing soil conservation practices, along with planting crop varieties that produce higher yields and contain more nutrients. They are also working to develop better livestock operations, in which there are breeding programs and adequate feed of adequate quality. These practices are being implemented to overcome major barriers that Rwandan agriculture faces. According to Country profile – Rwanda (2012), agriculture in Rwanda is rain-fed. This means that planting, harvesting, and livestock production all revolve around the rain cycles. The country may sometimes experience periods of drought, and at other times periods of flooding. Climatic factors such as the ones listed have a major impact on agricultural productivity. Another major barrier being faced is the slope and amount of land. Most of Rwanda’s countryside consists of very steep slopes. Most farmers have only a small plot of land, which is less than a hectare at best. It can prove difficult to grow crops, produce livestock feed, raise livestock, and live all on such a small, steep plot of land. Such adverse agricultural conditions lead to poor quality products, and a small quantity of them at that.

The barriers to agricultural productivity are having a widespread impact on the people of Rwanda. How are people supposed to have adequate food when not enough is being produced? The answer is simple: they go without eating or eat foods low in nutrition. Malnutrition is one the largest problems that the nation of Rwanda faces today. Food security is defined as “when people do not live in hunger or fear of starvation.” As much as 21 percent of households in Rwanda are considered to be food insecure. As one can see, the quality and quantity of agricultural production has a profound impact on nutrition in Rwanda. Major challenges must be overcome in order to provide everyone with adequate nutrition.

Malnutrition is the most significant factor having an impact on Rwanda today. This is especially being noticed in children, in the form of high stunting rates. Stunting is defined as “preventing from growing or developing properly.” Approximately 43 percent of children in Rwanda face stunted growth and development (“Comprehensive Food Security,” 2012). How are children supposed to grow, develop, learn, and thrive if they are not able to access proper nutrition? They are simply not able to. This lack of nutrition also extends to adults in Rwanda, with women and children facing the brunt of it. According to Health and Nutrition (n.d.), one tenth of women ages 15-49 are malnourished. This is often seen in situations where a woman is a single mother, and has the responsibility of both producing/providing food and caring for her child(ren). Farmers and their families are not able to climb out of poverty and hunger when they are surrounded by it. When people are malnourished they oftentimes become weak and sickly.

This leads to many ramifications, including compromised immune systems, increased disease prevalence, decreased food production, and prioritization of needs. Compromised immune systems lead to increased spread of disease, which then gives way to higher mortality rates. Decreased food production is partially caused by, in this situation, farmers and producers having less energy and being unable to work due to illness, weakness, tiredness, disease, and various other reasons. The most significant ramification is the prioritization of needs. This relates to Abraham Maslow's hierarchy of human needs, where food is a top priority ("Abraham Maslow," 2006). If Rwandans do not have proper food and nutrition, how can they advance on to other opportunities? Rwandans have gone into a type of "survival mode." They are focused on simply surviving by any which means they can. This often leads to Rwandans "falling back" on traditional farming and production methods. However, these methods are oftentimes part of the problem itself. If subsistence farmers are not adapting to modern agricultural practices, they will have a difficult time overcoming poverty and malnutrition. An example of this includes not utilizing genetically modified crops, which have the potential to greatly increase harvest yields. If Rwandans were to receive proper nutrition, they would be able to advance and make progress. They would be moving forward with more momentum than ever before, rather than just "spinning their wheels" and falling further behind.

Research establishes that malnutrition trends in Rwanda are not improving by much, and are staying the same for the most part. Health and Nutrition (n.d.) reveals that malnutrition indicators in Rwanda have shown little to no change over the past decade. This is an alarming statistic that is all too much a reality for the people most affected by it. The trends for malnutrition are measured using three main types of indicators: anthropometric, biochemical, and clinical ("Unite For Sight," n.d.). Anthropometric indicators are body measurements, such as weight, height, age, and even mortality rate. Biochemical indicators are a measure of micronutrient deficiencies, such as blood-iron levels. Clinical indicators are the effects of a micronutrient deficiency, such as poor vision and difficulty sleeping. A major indicator is the child mortality rate. This is because the death of children is most often caused by sickness, disease, weakness, and multiple other factors. However, all of these causes are linked back to a central cause: malnutrition. The mortality rate of children five years of age or younger, also known as the under-5 mortality rate, has been significantly reduced over the past four years. This rate is the probability per 1,000 that a newborn baby will die before reaching age five. The under-5 mortality rate was 58 per 1000 children in 2011, and was reduced to 42 per 1,000 children in 2015 ("Mortality rate, under-5 (per 1,000)," n.d.). This is a reduction of 27.6 percent. This reduction of the under-5 mortality rate shows evidence of a slight change in Rwanda. It emphasizes the point that nutrition has been slowly improving. While the change has helped to save many lives, which is very significant, it has not been enough to pull the nation out of malnutrition completely. If anything, Rwandans are slightly less malnourished than before. As previously mentioned, 90 percent of the population in Rwanda is engaged in subsistence farming ("Rwanda - culture and customs," n.d.). The situation is, for the most part, staying the same for these families and individuals. Nutrition has not been improved enough for subsistence farming families to experience a major impact. A 27.6 percent reduction of the under-5 mortality rate helps to save lives, but not to increase production or promote nutritional advancements.

Rwanda has significant potential to grow and flourish in many ways, if only malnutrition were to be greatly reduced or eliminated. This benefit would be seen on many different levels across the board. First of all, there would be a remarkable increase in the amount and quality of food. If people had the proper nutrition, they would be much healthier. Healthy people are able to work harder and longer, leading to increased crop and livestock production. If more crops are grown and livestock raised, a typical farm family would have more food to live on. However, not only the overall quantity of food is increased. An increase in quality is experienced as well. For example, a cow that is fed an adequate amount of food on a regular basis will produce more milk of acceptable quality than will a cow that sporadically eats smaller amounts. If a farm family is healthy, food production and quality are bound to increase.

The environment would also be better taken care of. Coates (2015) explained that Rwanda is a very hilly country, in which steep slopes are prevalent. Farmers would better-utilize the land in order to increase production. This would be experienced by implementing conservation practices and appropriately using land. Such practices include no-till farming, terracing, strip cropping, and many other methods. In addition to conservation practices, land would also be better-utilized. This comes in the form of identifying the best use of and how intensively land should be used, and then using it in that manner. Treatment methods are then carried out to help ensure the land does not degrade further. These methods often come into play as the conservation practices previously alluded to.

The elimination of malnutrition would have a major impact on both the economy and poverty. The poverty headcount at national poverty lines has recently seen a significant reduction, going from 56.7 percent in 2005 to 44.9 percent in 2010 (“Rwanda,” n.d.). This is an 11.8 percent decrease over a period of just five years. One must take into account that this reduction occurred during a time when malnutrition was not improved by very much. An even greater reduction would most definitely be seen if malnutrition were to be greatly reduced or eliminated completely. As previously established, people that receive proper nutrition are healthy, active, able to work hard, and able to make advancements. All of these attributes lead to increased agricultural production. Increased production leads to increased profit, and increased profit leads to increased economic activity. Farm families would have more crops and products to sell or barter, leading to economic advancement on both local and national levels. Once the door to economic development is opened for Rwandans, the opportunities are endless.

Under-advantaged groups, specifically women, children, and smallholder farmers, would be greatly benefited by the improvement of Rwanda’s malnutrition issue. Currently, women and children are especially disadvantaged. In accordance with statistics previously cited, 43 percent of children experience stunting, while one tenth of women ages 15-49 are malnourished. These unfavorable statistics would be improved, as women, children, and everyone else would be able to afford proper healthcare. This is seen as a direct effect of increased production and profits. Also, women would have a better chance at receiving prenatal care, hopefully leading to less children born with complications and a lower infant mortality rate. Single mothers could depend more on their children to work and contribute to the family cause. Smallholder and subsistence farmers would also be greatly benefited. It has already been made very clear that production and profits would increase. However, farmers and their farms would also be in a better condition to expand their operations. This could mean anything from increasing herd or field size to adding new business units, such as growing different crops or adding a different species of animal.

Climate volatility is a major issue that has an impact on both malnutrition and the wellbeing of families in Rwanda. One could argue that climate volatility is a major contributing cause of malnutrition. This is in the way that Rwanda experiences both flooding and prolonged periods of drought, in many regions across the nation (“Rwanda Environment Management Authority,” n.d.). It becomes very difficult to grow crops and raise livestock when the climate falls on both ends of this spectrum. Saturated and submerged soil lead to lower crop yields, and often to no crops at all. This then has a direct effect on livestock production too. If crops are not able to grow, what are farmers supposed to feed to their livestock? If crops cannot grow, and livestock cannot eat, what are families supposed to eat? It is amazing how much of a “domino effect” can occur when it comes to food security. As if that is not already detrimental enough, flooding can also injure or kill animals. Sometimes there is simply not enough dry land for the livestock to even be on. While flooding has a major impact, drought does just as much damage. Similar effects are experienced during periods of drought as are experienced during flooding. Drought causes crops to not grow, and causes livestock to suffer from heat exhaustion and a lack of water. Once again, livestock and families are unable to eat if crops do not grow. Looking forward, this would have a major impact on the wellbeing of a family and community over time. If families suffer from a lack of food year after year, they will become malnourished. Once this occurs to many families in the same geographic area, the

community becomes greatly affected. This is observed through reduced economic activity, widespread malnutrition, and a host of other issues.

Looking forward, how can Rwanda overcome malnutrition? One major solution that stands out from others is to implement farm to school programs, in addition to developing school owned/operated gardens and farms. The first component of this solution is to convey to both the government and public just how much of an impact this would have. The government is an especially important entity to get involved, because they own the land that would be utilized. They would also most likely be a major financial contributor. The public is also important, as local farmers and citizens would have much to offer as well. This could be in the form of equipment, expertise, and even labor. Once stakeholders are convinced of the viability, the potential for such a project becomes immeasurable. The first component of this solution is to provide children with farm-fresh food. They would be eating healthy items that come from local farms. Current school lunches in Rwanda are very starch-oriented (as well as nonexistent in many areas), but that would be changed. In addition, farmers would be making money in the process. Schools, funded by the government, would be buying these items from local farmers. The second component of this solution is to create school gardens and/or farms. Schoolchildren would literally be raising their own food. The average daily calorie intake for an individual in Rwanda is 2,938 calories (Nutrition Country Paper - Rwanda," 2013). However, this mainly consists of starches and carbohydrates. Protein is a missing component. These new programs would help children to receive the protein they need to think, grow, and learn. First, students would be consuming healthy, wholesome, and nutritious food that would improve their overall health and ability to learn. Second, students would be educated about production practices and meal planning. This comes in the form of actually "getting their hands dirty" and working in the garden or with the animals. This would be an opportunity to add more protein to the menu, as livestock could be raised for meat as well as other products. The addition of a significant amount of meat to a child's diet would make all the difference, as they currently consume very little meat at home. Students would learn by doing, in conjunction with a specialized agriculture curriculum. A small-scale program similar to this was started in Rwanda back in 2002. It was funded and supported by the Food and Agriculture Organization of the United Nations, with a grant of \$374,012 (Ndahiro, 2006). The project was implemented in 10 primary and 10 secondary schools. Students were involved in planting, weeding, watering, harvesting, and many other tasks. Parents and teachers reported improved student health, increased knowledge about plants, better academic performance, and even improved family diets. Each school was also provided with a Friesian cow. This project has already been successful, but could be scaled up to make an even greater impact. This would be accomplished by implementing the program in every single primary and secondary school in the nation. What an impact it could make to provide daily meals during school sessions! Schools do not currently provide a "standardized" meal to students each and every day. This would be a tremendous step in the right direction. While Ndahiro (2006) does not mention specific types of crops, it would be crucial to grow a diverse group of plants in the garden. This would help ensure that students receive a wide variety of nutrients. The same goes for animals, by raising more than just dairy cattle. Chickens could provide eggs and meat, and hogs could also provide meat. Meat production may be somewhat of a challenge, as refrigeration and storage are not optimal in Rwanda. Nevertheless, it would still be beneficial to expand upon what has already been done. Another facet of this expansion is to make sure that students are receiving proper agricultural education surrounding these gardening and farming projects. This would be accomplished by developing a type of extension service, similar to what universities in the United States have. The extension service would employ individuals that are trained in nutrition and agricultural production practices. These extension workers would then travel around and teach children at all the different schools. It would be logical for a school to receive two to three visits per week from these extension workers. The final major solution is to plant nutrient-fortified and genetically-modified crops. This could prove to be a difficult task, as most Rwandan farmers are used doing things the traditional way. However, these crops offer a great deal of nutrition and increased yields. An essential component of integration with these crops is to grow them in the school gardens. This way, children would start to accept and understand the benefits of these crops from a young age on. As they get older

they would be more apt to grow these crops themselves. If children do not know otherwise, they will embrace the new technology and apply it to their situation. It is imperative that children learn how to grow crops and raise livestock the proper way, because they are the next generation of Rwandans. They are the ones that will be facing issues such as malnutrition and climate volatility during the next 50 to 100 years. If they learn how to prevent and combat malnutrition now, they will be prepared to do so once they have their own families and have to provide for themselves.

How is everyone able to do their part to help Rwanda grow out of malnutrition? Each group of people and organizations has their own roles to make a difference. First and foremost, the rural and urban families most affected should be involved in efforts. They are the ones suffering from malnutrition, and must work together to solve this problem. It is imperative that Rwandans are involved in the effort to overcome their own problems. Communities are also a major part of putting this plan into practice. Farmers from Rwanda must work together if they want to see results. This means helping each other plant, harvest, and care for livestock. In addition, they should be sharing ideas and production methods to help everyone thrive and prosper. Even non-farming members of the community have a role, by supporting farmers in what they are doing. A lot can be accomplished when support is widespread. The national government also plays a key role in working to eliminate malnutrition. As previously mentioned, the government funds schools and has the “final say” on almost everything. They must be proactive in helping farmers and schools to increase production and nutrition, while reducing malnutrition. Other major groups and organizations should also contribute. These groups include the United Nations, World Bank, and private scientists and research organizations. The main impact these groups can have is to bring outside knowledge and support into Rwanda. They have connections to other countries and groups that are more than willing to offer support. Foreign researchers are able to introduce practices and information that comes from all parts of the world. This synthesis of knowledge would have an immeasurable impact. Why couldn't scientists and other experts volunteer to help teach children and their families about agriculture? Why couldn't they be a driving force behind the creation of an extension service? The possibilities are endless if everyone works together for the common good. Finally, even individual people from other countries can make a lasting impact. What can we, as Americans, do to help Rwanda? Donations are often the best way for individuals in foreign nations to help out. These donations may range from monetary gifts to canned food. What may seem like a small gesture or donation to us has the potential to make a massive difference in Rwanda. Furthermore, international actors and players can do more than simply donating money or sending food. Oftentimes, this only helps in the short-term. Do you remember how refrigeration and food storage in Rwanda are either of poor quality or simply nonexistent? This presents a grand opportunity for organizations and individuals to share their talents and resources with those in need. Maybe engineers could help design feasible refrigeration systems. Individuals could go on a mission trip to help install such equipment, or maybe even to just help transport as the nation has poor infrastructure. As more is done over longer periods of time, conditions and quality of life begin to improve. As you can see, everyone can do something. No matter how big or small, it all makes a difference.

Rwanda has definitely suffered from hardship after hardship in the years past. Rwandans have grown far too used to this unacceptable condition. Problems have occurred in many realms, with malnutrition standing out even more so than other issues. The fact of the matter is that conditions in Rwanda will not improve if nothing is done about malnutrition. A major part of the solution is to target children with relief efforts. They are the next generation, and will be most affected by what is done today. School gardens and farms, along with improved agricultural education and school lunches, will lead to an overall decrease in malnutrition in Rwanda. Plant science will also help, through the use of nutrient-fortified and genetically modified crops. These steps toward food security offer a long term solution for all Rwandans. An improvement will be seen if everyone involved works together to implement long term solutions that promote change for the better. People from Rwanda and afar must make efforts to improve conditions. In our efforts, we must listen to the echoes of Dr. Norman Borlaug, who once said, “The destiny of world

civilization depends upon providing a decent standard of living for all mankind.” Malnutrition is a major issue that cannot be solved without the involvement of many people, groups, and organizations. It is indeed possible to grow Rwanda out of malnutrition, even if it is one plant at a time.

Bibliography

- Abraham Maslow. (2006, January 1). Retrieved February 15, 2016, from <http://webpace.ship.edu/cgboer/maslow.html>
- Climate & Agriculture. (n.d.). Retrieved December 7, 2015, from <http://www.our-africa.org/rwanda/climate-agriculture>
- Coates, K. (2015, August 05). Rwanda is an International Development Success Story. But Can it Survive Climate Change? | UN Dispatch. Retrieved February 18, 2016, from <http://www.undispatch.com/rwanda-is-an-international-development-success-story-but-can-it-survive-climate-change/>
- Comprehensive Food Security and Vulnerability Analysis and Nutrition Survey. (2012). Retrieved December 9, 2015, from <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp255690.pdf>
- Country profile - Rwanda. (2012, July 1). Retrieved December 9, 2015, from <http://www.new-ag.info/en/country/profile.php?a=2694>
- Health and Nutrition. (n.d.). Retrieved February 15, 2016, from http://www.unicef.org/rwanda/child_rights_8298.html
- Infographic: Health Care in Rwanda Improves Dramatically. (2013, February 15). Retrieved December 7, 2015, from <http://www.pih.org/blog/health-care-in-rwanda-improves-dramatically>
- Kalisa, A. (n.d.). Characterisation of farming systems in southern Rwanda. Retrieved December 9, 2015, from http://www.memoireonline.com/02/09/1949/m_Characterisation-of-farming-systems-in-southern-rwanda7.html
- Mortality rate, under-5 (per 1,000). (n.d.). Retrieved February 16, 2016, from <http://data.worldbank.org/indicator/SH.DYN.MORT>
- Ndahiro, A. (2006, July 1). School Garden in Rwanda. Retrieved February 23, 2016, from <http://www.fao.org/schoolgarden/doc/Rwandastory.pdf>
- Nutrition Country Paper - Rwanda. (2013, February). Retrieved July 19, 2016, from http://www.fao.org/fileadmin/user_upload/nutrition/docs/policies_programmes/CAADP/east_central_africa/outputs/country_papers/Rwanda_NCP_210213.pdf
- Rwanda. (n.d.). Retrieved February 19, 2016, from <http://data.worldbank.org/country/rwanda>
- Rwanda - culture and customs. (2012, August 9). Retrieved December 4, 2015, from <http://glapd.com/about/where-we-are-from/rwanda-culture-and-customs/>
- Rwanda Environment Management Authority. (n.d.). Retrieved February 22, 2016, from <http://www.rema.gov.rw/soe/chap9.php>
- Rwanda's literacy rate rises. (n.d.). Retrieved December 7, 2015, from <http://www.statistics.gov.rw/publications/article/rwanda's-literacy-rate-rises>

Unite For Sight. (n.d.). Retrieved February 15, 2016, from
<http://www.uniteforsight.org/nutrition/module7>

