

Annie Johnson
Lincoln High School
Des Moines, IA
Burundi, Factor 1

Burundi: Decreasing Hunger by Increasing Crop Yields Through New Technologies in Seed Innovation

Twelve years of civil war in a once-beautiful Burundi have left the country living in poverty with no where near enough food to feed itself. As other African countries, not engaged in war, have been reducing the amount of food shortages and malnutrition (“Africa Shows Progress on Hunger, Report Says”) with help from food safety programs around the world, Burundi’s conflict has delayed them in receiving new technologies and innovations, especially in agriculture, that have been developed in the past few decades. A setback like this takes time to fix, but sadly the citizens of Burundi do not have this critical time since 81% of the population is food insecure (“Burundi”), the third highest in the world (Global Food Security Index). Years of fighting a civil war, along with ethnic cleansing, have created one of the poorest countries in the world. This was the primary cause of food insecurity that was made worse by the recent droughts, plant diseases, poverty, an absence of arable land caused by soil erosion, and an absence of potable water (“Burundi: Towards Greater Food Security”). With a new government full of ideas to improve this little country, time is of the essence to turn around the damage that has already been done by previous generations and to make life viable for future generations. For Burundi to become food secure, it must first receive drought resistant seeds to maximize crop yields. By increasing crop yields, Burundi’s economy will be allowed to advance, the country will work towards becoming developed, literacy rates will improve, health care will become better and easier to access, and Burundi will no longer be a victim to the food insecurity that has threatened the lives of so many throughout time.

A household in Burundi typically consists of two parents and five children (Garai). A family lives in a house complex that is connected to or close to the complexes of their extended family members (Culture of Burundi). Primary schooling is theoretically free and available to all children. Catherine Mbengue, a UNICEF Representative said, “This is an incredible opportunity for Burundi to be engaged in meeting the Millennium Development Goals, to meet the objective of universal primary education for all children.” (Li) However, only approximately 50% of children benefit from this (Burundi Food Security and Vulnerability Analysis Report), since many families keep their children at home to work in the farm fields. Also, there are few resources to make school successful. This small number of students attending school is surprising since 72% of sous-collines (similar to a village) have a school in the community or within thirty minutes (Burundi Food Security and Vulnerability Analysis Report). Overall, 59% of boys attend primary school, but only 48% of girls attend (Li). After primary school, only 8% of children are then enrolled into secondary schools (Culture of Burundi). Even a lower percentage of students receive higher education, partially because there is only one university in the entire country, and it is in the capital Bujumbura (Culture of Burundi). This low percentage of students completing school has led to a 35% literacy rate (Culture of Burundi). The statistics for the health care system are even more devastating than the education system, as two million citizens are left with no access to any health care. A policy that was enacted in 2002 forces patients to fully pay for their medicine and care they receive (Philips, Mit, Gorik Ooms, Sally Hargreaves, and Andrew Durrant). Since more than 99% of the population lives on less than \$1 a day (San Frontieres), this has caused 81.5% of patients to go into debt or be forced to sell a portion of their property (Philips, Mit, Gorik Ooms, Sally Hargreaves, and Andrew Durrant). In fact, 17.4% of sick citizens will not look for help because they can not afford it (Philips, Mit, Gorik Ooms, Sally Hargreaves, and Andrew Durrant).

Ninety percent of Burundi’s population lives on a farm (Burundi in Depth) where the average family has half a hectare of land to farm or raise livestock (Burundi: Towards Greater Food Security). Common

crops grown include: beans, bananas, sweet potatoes, manioc, cassava, maize, and sorghum. However, these crops account for only 15% of sales, making the cash crops of coffee, tea, and cotton the major agricultural export in the country (Burundi in Depth). Burundi citizens' diets typically consist of pulses, oil, manioc, and sweet potatoes. Manioc leaves, fish, vegetables, corn, and rice are also commonly found in their diets (Burundi Food Security and Vulnerability Analysis Report). Even though these foods are available, the typical person only consumes 1,473 kcal/day, approximately 600 kcal fewer than the recommended 2,100 kcal/day ("Burundi"). The limited variety of food products have left 46% of the population chronically malnourished ("Burundi").

The 12-year civil war left Burundi devastated. Livestock was killed, farms taken, land ruined, and many were left without a home. As refugees have returned and children have inherited the land of their fathers, the family farm has gotten smaller making it harder to produce enough food to live on. With a lack of new technologies and innovations, Burundians have not increased the yields produced from a plot of land. Now the average person spends 70% of his/her income on food ("Burundi"). As it has become harder to live by owning a farm, citizens have started walking miles to neighboring countries, like Rwanda, to work for a day returning home hoping they made enough to feed their family that day. A woman from Burundi said, "I am not able to go to Rwanda like others. So I try to find work here and there, but at my age, it is not easy to get. They prefer young people who are able to work. If they see me working, they generally tell me not to come back the next day even if here is still work." ("Burundi: Drought Leaves Thousands Needing Food Aid") Since few farmers produce excess crops, the food found at the market is imported from other countries, increasing food prices nearly 37% ("Burundi"). To stop the high market prices, local farmers must start producing more food to feed their country and then enough to sell to neighboring countries.

To increase the quantity of food in Burundi, new seed technologies need to be developed by making seeds that are resistant to droughts. This would allow for greater yields that would not have previously been available to feed the growing population. According to IRIN, in 2010 Burundi had little rain which led to tens of thousands Burundians without a crop and left with no food to eat or sell. Having seeds resistant to a drought would prevent events like the one that occurred in 2010, that left many starving and traveling to work for minuscule amounts of money. The appearance of drought-resistant seeds would allow farmers to produce crops even during times of drought, like the one that has been present for the past three years (Rural Poverty in Burundi). If every farm family in Burundi has access to drought resistant seeds, then the percentage of the population that is food insecure will decrease dramatically because of an increase of crop yields. This increase in crop yields will not only allow farmers to have enough to feed their family but also produce extra to sell at market. Once farmers have made extra money from selling their excess crops, they will be able to afford to buy products that will give them and their families the recommended vitamins and minerals to live a healthy life.

In Burundi, the GDP is \$3.2 million, the 31st lowest of 193 countries according to the World Bank in 2011 (Gross Domestic Product 2011). With an economy so reliant on agriculture, fixing the agriculture market would in turn fix Burundi's economic turmoil. To do this, farmers need to start producing more than they need, in order to see any change in high market prices. After the market prices are reduced, the economy will get better and the country's GDP will rise. Once Burundi has increased their GDP, they will be able to save lives by improving health care access and prices, put money into schools that desperately need funding, and eventually become a developed country by investing money into technology.

The introduction of plant science will also be necessary in the future as issues such as water scarcity, climate change, and population growth become prevalent. As water becomes scarce and a drought continues to wreak havoc on Burundi, plant seed modifications will become necessary to ensure that crops will be harvested each season and that the families of Burundi will be able to eat. In the future, drought-resistant seeds will be necessary. Plant science is needed to create seeds that are adapted to

Burundi's worsening conditions. As the dense population of the country grows, plant science is needed to keep production at peak performance. A modification in seeds, along with new methods of planting them, will guarantee that Burundi has an adequate supply of food to meet the growing population for not only themselves but the rest of the world in years to come.

Currently there are few programs in Burundi that are working toward plant science. The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) is one that operates in 10 African countries, including Burundi, to "enhance regional collective action in agricultural research for development, extension and agricultural training and education to promote economic growth, fight poverty, eradicate hunger and enhance sustainable use of resources in Eastern and Central Africa," (ASARECA). Since 2006, the program has distributed over 1,500 tons of drought resistant maize seed to Burundi and four other Central African countries. Over the past few years thousands of families have been helped by the ASARECA foundation, but millions more still have not been reached. Since ASARECA does not solely focus on the development and distribution of seeds in Burundi, a separate section could be developed that focuses directly on plant science technologies in Burundi.

The first step in improving food security for a typical family in Burundi is providing them with the proper seeds that are resistant to the reoccurring drought. However, the beginning of plant science in Burundi does not start there, but in other parts of the world. Researchers in developed countries, like the United States, have already created drought resistant seeds. These newly developed seeds just need to be distributed throughout the country for free, at first, and then for a small price once farmers realize the importance of using the new seeds and how well they work with the conditions of the land. Before the seeds can be distributed, a program needs to be established that gets funding, has access to large quantities of drought-resistant seeds, and has the ability to distribute seeds across the country. Once a program like this has been established, they need to go around to the villages in Burundi and give the farm families enough seeds to plant for the upcoming harvest. The community then needs to be taught about how to get the maximum number of crops from their small plot of land. The best way to do this would be by bringing volunteers to schools to teach the children. The children would then be able to teach their parents and other members of the community. Not only would educating the children improve crop yields but it would encourage parents to send their children to schools. As time would go on, literacy rates would rise along with an increase in crop yields, helping with education, food insecurity, and the overall economy.

Solving Burundi's food insecurity dilemma would in turn help the United Nations reach their Millennium Development Goal of eradicating extreme poverty and hunger. If a country like Burundi is able to go from being 81% food insecure ("Burundi") to relatively food secure, the United Nations would have a case study of how to fix food insecurity in other food insecure counties around the world. The beginning of food security starts with new ideas and innovations. This can only be found by science and research. If countries like Burundi worked hard to implement new seed technologies, then the United Nations would be able to reach their goal to eradicate extreme poverty and hunger.

Communities around the world could help with the problem of food insecurity in not just Burundi but all over the world by getting informed and volunteering, whether it be from time, money, or becoming an advocate. The first step that needs to be taken is to inform leaders of the problems that Burundi is facing. Many adults do not know the problems that are faced throughout the world, especially the problems that are prevalent in many developing countries. Once people are aware of the issues and the facts surrounding them, they are more likely to get involved. Organizations like Meals from the Heartland should broaden their horizons and create more locations for people to volunteer to pack meals. These organizations should also offer their aid to every country based on the amount of need. The United Nations is also a key player in ensuring that Burundi will leave their phase of food insecurity. The United Nations can raise awareness to the rest of the world that Burundi is a country that needs and deserves help after the many

years of hardship they have endured. Families from all backgrounds are able to help solve food insecurity in Burundi by spending time packaging meals, testing drought resistant seeds, learning about the problems in Burundi, or deciding to donate money to organizations whose mission is to stop food insecurity.

The change that is needed to save Burundi can not happen overnight, so work needs to start now to ensure that more lives are not ruined by the absence and uncertainty of where one's next meal will come from. Not only is food a necessity to survive biologically, but it is also a necessity economically for the people of Burundi. Without food, they have no means to support themselves and their families. This is a nation where 90% of the population relies on agriculture and livestock ("Burundi in Depth") and where 70% of income is spent on food ("Burundi"), making food the most important resource in Burundi. The introduction of plant science to develop drought resistant crops will enable Burundi to make the first step in becoming food secure. By doing this, the yields in crops will rise, families will have enough to eat, excess food will be able to be sold at market making it possible to make an income, the economy of Burundi will get better, and then money can then go back into healthcare and the schools. All these factors need to be enhanced for Burundi to become a nation that no longer needs to live in fear of where their next meal will come from. Therefore, the distribution of drought-resistant seeds through plant science is the first step that needs to be taken to move Burundi from a developing food insecure nation to a developed food secure nation.

Works Cited

- "Africa Shows Progress on Hunger, Report Says." *BBC News*. BBC, 10 Nov. 2012. Web. 18 Mar. 2013.
- ASARECA*. N.p., n.d. Web. 20 Mar. 2013.
- "Burundi: Aid Workers Worry about Food Insecurity." *IRINnews*. N.p., n.d. Web. 18 Mar. 2013.
- "Burundi: Drought Leaves Thousands Needing Food Aid." *IRINnews*. N.p., n.d. Web. 20 Mar. 2013.
- "Burundi." *FAO.org*. N.p., n.d. Web. 20 Mar. 2013.
- Burundi Food Security and Vulnerability Analysis Report*. N.p.: WFP, Dec. 2004. PDF.
- "Burundi in Depth." *Embassy of the Republic of Burundi*. N.p., n.d. Web. 18 Mar. 2013.
- "Burundi: Towards Greater Food Security." *IRINnews*. N.p., n.d. Web. 20 Mar. 2013.
- "Culture of Burundi." *Countries and Their Cultures*. N.p., n.d. Web. 20 Mar. 2013.
- Garai, Romola. "Romola Garai: A Life-changing Trip." *Blogs*. International Rescue Committee, n.d. Web. 18 Mar. 2013.
- Global Food Security Index*. N.p., n.d. Web. 18 Mar. 2013.
- Gross Domestic Product 2011*. N.p.: World Bank, 2011. Microsoft Excel.
- Li, Kun. "Burundi: Free Primary Education for All Children." *UNICEF*. N.p., n.d. Web. 18 Mar. 2013.
- Philips, Mit, Gorik Ooms, Sally Hargreaves, and Andrew Durrant. "Burundi: A Population Deprived of Basic Health Care." *PMC*. NCBI, Aug. 2004. Web. 19 Mar. 2013.
- "Rural Poverty in Burundi." *Rural Poverty Portal*. N.p., n.d. Web. 20 Mar. 2013.
- San Frontières, Medecins. *Access to Health Care in Burundi*. Brussels: Doctors Without Borders, Mar. 2004. PDF.