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Eritrea, Sustainable Agriculture
Eritrea: How Social and Environmental Factors Impact Farming

While most of us take for granted the basic necessities of available food, healthcare, and electricity, countries around the world struggle daily to meet some of their citizens' most basic human needs. Third world and underdeveloped nations are unable to consistently provide their citizens with adequate amounts of food and water. The lack of food security in the Eastern African country of Eritrea is due in part to the inability of subsistence farming to meet the population's needs, lack of governmental support, high risk of infectious diseases, and threats to basic freedoms that Eritreans face daily. The country, bordering the African countries of Sudan, Ethiopia, and Djibouti, finds itself with 68% of the population unable to obtain adequate meals and 39.4% of children under the age of five underweight (CIA World Factbook, 2020). By shifting the focus of their crop production to sustainable practices that are less dependent on rainfall and making improvements to water and sanitation systems that are not reliant on the climate, the Eritreans can restore the amount of crops they lose annually due to drought and increase their food supply to combat their population's empty stomachs.

In the presidential republic of Eritrea, the government is struggling to keep up with the 6,081,196 Eritreans who all need the basic necessities of food, water, and shelter (CIA World Factbook, 2020). Although the area is slightly smaller than Pennsylvania, the terrain of the country as well as the environmental conditions vary widely based on location. From the dry desert along the Red Sea to the semiarid hills in the west to the central highlands, much of the quality of life, crop yields, and risk of environmental disasters are due in part to their geographical position. Frequent droughts in the heavily populated central areas, soil erosion, and overgrazing all contribute to making Eritreans unable to meet their needs because of their reliance on subsistence and unsustainable farming practices. These problems, along with being the poorest country in Africa, mean that Eritrea's agricultural economy has taken a hit from the environment and their political conflicts in years past (BBC News, 2018). Farmers and families cannot rely on variable rainfall patterns, land degradation, and the increasingly shrinking arable land to provide adequate food supply and avoid malnutrition.

As half the citizens live below the poverty line in Eritrea, concern over families and their well-being continues to grow along with the deficit of food available to adequately meet Eritrean families' nutritional needs (Humanium, 2019). The main victims of inadequate food supply for consumption are children. Children are mainly nursed by their mothers for as long as they are able, but soon after being weaned are fed a normal diet of the crop yield of subsistence farms and fish and meat from their herding. The amount of food produced in Eritrea is insufficient resulting in 39.4% of the country's children under the age of five being underweight (CIA World Factbook, 2020). This not only could cause stunted growth or maturation later in life but could cause immediate health problems due to malnourishment. With over half of homes in rural areas that lack electricity, close access to clean water, and have conditions where bacterial diseases run rampant due to poor sanitation, the Eritreans are at high risk of major infectious diseases such as Hepatitis A and Malaria which are not easily treated as only 5% of Eritreans have access to high quality and modern healthcare (Humanium, 2019). As well as the damaging impacts of malnutrition and lack of food, the subsequent health impacts on the citizens include diabetes and anemia with 38.1% of women having anemia and 6% of men facing diabetes (Global Nutrition Report, 2019). While the effects of living conditions and unequal access to healthcare impede wellness, the issue of lack

of opportunities in Eritrea contribute to an increasing number of citizens leaving the country. Fleeing to neighboring countries of Sudan and Ethiopia, many seek better conditions and governmental support of their health and problems that are nationwide in the country of Eritrea. While the families of Eritrea face the uncertainty of their farming and food sources, the lack of clean water and sanitation as well as healthcare that is not available despite the festering diseases and results of malnourishment, the cards are stacked against these families in the face of the adversity this country is hosting.

While the government of Eritrea is a presidential republic, it is a growing concern of the nation's citizens that the amount of political discord between Eritrea and its neighboring countries as well as the lack of strong leadership is impairing the government and its ability to lead the people to solve these widespread problems to create better living situations for all Eritreans. In recent years, Eritrea and the country of Ethiopia have been at war- even after the thirty-year long war of Independence wherein Eritrea separated from Ethiopia after they had been combined since the end of World War II. Since the war of independence, lasting from 1961-1991, there have been tense relations between the two countries regarding border disputes (New World Encyclopedia, 2017). Claiming that these border disputes stem from not a simple line argument but over "national pride" and "territorial integrity", the tension and conflict faced as a result of the disputes have left Eritrea to foot the bill of large spending on defense and no way to help make internal improvements regarding agriculture and food security or investments in new imports and exports to bring in money for the country (Barry, Gilkes, 2005). These disputes continued until 2018, when diplomatic relations were finally enacted and the UN was able to release its sanctions; however, the economy of Eritrea has yet to recover (BBC, 2018). With so much of Eritrea's national budget going to defense, there was a sharp rise in human trafficking in Eritrea creating high numbers of victims and the crimes being unable to be controlled without additional government funds. Seeking forced labor and sex trafficking, criminals kidnap men, women, and children in the vulnerable situations of refugee camps, work camps, or educational trips. The political discord and the domestic issues of trafficking that are unable to be funded and supported as with food insecurity is another example of the unreliability of the government and the lack of support for citizens' basic needs and protection.

The government of Eritrea's lack of focus on human needs but rather directed towards defense and national pride is one that, if successfully shifted, can improve the lives, health, and quality of their citizens and their country. Far more important than military power, the communication and collaboration with organizations such as UNICEF and the World Food Programme will not only increase their resources and access to sustainable farming technology and education, but also broaden their expertise on how to escape poverty and into comfort rather than just survival. Introduction of their farmers' increased yields can relate into the increase to imports and exports. By shipping their products to other areas and also bringing new ones in, the country will improve their global relations and identity and stimulate the economy to further their improvements. While this process is far more complicated than simply beginning to trade, capitalizing on their agricultural products to get involved in international trade improves economic growth, social mobility, and access to new, western technologies. Governmental support of trade is only one aspect of how the leaders can support their people. Far more importantly, the reallocation of funds from defense and less necessary spending ventures directed towards the protection of their citizens from trafficking, economic opportunity that prevents the need to migrate elsewhere, and the support of farmers to feed their people are how the Eritreans can transition into a more sustainable and promising future.

In order for Eritrea to fund and provide a secure and safe food future, the country needs to emphasize sustainable agriculture and implement better farming technology and practices. By becoming less reliant on the unpredictable rain patterns and droughts, their methods of subsistence farming will be able to more adequately sustain their food needs for the population. As their agricultural industry becomes more

climate resistant, productivity and sustainability of the small-scale farmers and agricultural systems will increase. Since the climate of Eritrea is subject to cyclical droughts and lack of access to clean water, aqueduct systems, or man-made channels used to transport water across land for the purpose of drinking or agriculture, can be added to get water from the coast and to distant farms inland in order to become less reliant on rainfall. These historic devices that have continued into modern day agriculture allow farmers to obtain clean water that they can use to water their crops even if they are far from a water source. With this increased mobility and access to water, the farmers can use a system of watering their plants where they give a plant only what they need and nothing more. By monitoring the moisture of the soil, they can tell which crops need the water and which can go awhile longer without it. This ensures that all crops get what they need while at the same time valuing and managing their use of such a precious resource. Without relying on the volatile and varied rainfall patterns that many parts of Eritrea combat, producers can rely on their crops and food source year-round and not have to worry about droughts ruining their food source or their income.

Another agricultural practice that could transform the way that the Eritreans live is introduce genetically modified crops. These modified species of different plants would allow for more resilient crops against climate, insects, and the environment as a whole (Byrne, 2014). By maintaining the plant's integrity while making it more reliable, drought tolerant, or even creating varieties of crops with higher nutritional values, the crop yield would support and sustain generations of Eritrean families. While this practice has fielded many debating views, it has been proven that GMOs are a cost effective way to "reduce soil-damaging tillage, reduce carbon emissions, reduce insecticide use" which are all beneficial to improving the health of the land as well as the environment of Eritrea to benefit their crops (GRIST, 2014). Promoting the benefits of these practices is a very real way to not only bolter the health of the present population, but also to set the stage for a vastly improved future. Without the access to funds for large equipment or the cost it takes to maintain these technologies, the scientific approach of farming is far more feasible with the demographics of countries such as Eritrea to elevate farmers and citizens out of hunger and poverty as efficiently as possible. While these new technologies and scientific advancements such as aqueducts and GMOs are modern and effective, seemingly simple practices such as increasing the amount of arable land and using rotation practices in order to not tire the soil could also help production and reliance on the majority rural and agriculturally dependent country. Crop rotation is when farmers grow different species of crops in different seasons in the same land as to not tire the topsoil and maintain the nutrients' integrity. By growing different crops and increasing the annual yield while maintaining the amount of land and its value, more Eritreans could be fed without increasing the amount of farmland. While the governmental support of Eritrea will be valuable in these solutions, other organizations such as UNICEF and the United Nations' World Food Programme continue to provide aid both financially and in the form of donations of supplies, seeds, and labor.

As the entire population of Eritrea is facing similar issues surrounding food insecurity and sustainable growing practices, those that should focus on getting involved and implementing these new technologies and measures are women and the more rual, poorer families. Women are at higher risk for diseases, abuse, and malnourishment as it is often the mothers who sacrifice for their family's needs. Not only will teaching and promoting the use of agricultural procedures such as crop rotation and aqueduct systems improve food quantity and quality, but it will also elevate women's social status and independence. Owning land and the ability to support themselves and their families vastly improves women's labor productivity, equality, and self-esteem. Without reliance on a man or family member, the woman is able to flee from abuse and into her self-made prosperity as well as equality. Organizations such as the UNDP are currently assisting women in discrimination and inequality issues regarding employment, finances, and human rights, but the increased focus on the benefits of agricultural independence and sustainable

farming will do more than just improve quality of life but also aid in “attaining sustainable human development” (UNDP in Eritrea). The majority of Eritreans who are living in more rual areas would also benefit from the same sustainable growing practices and increased access to technologies because they are also more at risk for the lack of access to good, nutritious food as well as to healthcare. By growing their own food in an environmentally cautious way that simultaneously helps alleviate their hunger, they are decreasing their likelihood to be at risk for more food insecure related ailments. While the entire Eritrean population will benefit from the introduction of modern technologies and advancements that many parts of the world are already implementing, these things could change the lives of the most at-risk individuals and groups in the community by not only feeding them, but by empowering them to become good stewards of the land and individual citizens.

In a society where those individuals who benefit from the industrialized, modern world often take advantage of the ease and access to technology, information, and resources, it is important to remember not only that there is not only one solution, but also that some solutions are not one size fits all in differing developing countries and regions. The use of chemically ridden pesticides and marketed agricultural products may seem like an effective and cheap way to benefit crops, but they often have detrimental impacts on the soil and the environment. Useage of GMOs and more resilient farming methods reduce the need for harsh pesticides and irritants that are often misinterpreted as an easy fix to a larger problem. Simply increasing arable land can also be harmful to the environment as this is often seen as just simply clearing more land. Deforestation not only reduces habitats of the wildlife that is living there, but also is more harmful than beneficial to the crops. Through “fostering biodiversity and providing habitat for pollinators”, farmers improve the quality of life for the animals that are often overlooked as beneficial to crops’ productivity (UCSUSA, 2019). Since the area of Eritrea is smaller than the state of Pennsylvania, protecting the land that they have for the people, the crops, and the wildlife is mutually beneficial to all its living creatures.

While there are countless factors that go into making a country flourish, the most basic needs of food, water, and shelter will always drive a country’s decisions. These needs will never go away and so it is the job of the world’s governments in every country to promote and understand the value of sustainable and secure necessities. Implementing sustainable agriculture, technologies, and support will lead to fewer of the world’s citizens going hungry. Agricultural practices of introducing aqueducts, GMOs, increased support from NGOs, and crop rotation will not change the face of the problems of Eritrea overnight, but the path that will stem from these improvements will lead to a healthier future and leave a tumultuous and volatile history in the past.

Works Cited

"Children of Eritrea." *Humanium*, 14 Mar. 2020, www.humanium.org/en/eritrea/.

"The Children." *UNICEF Worldwide*, www.unicef.org/eritrea/overview.html.

"Eritrea Nutrition Profile." *Global Nutrition Report*, 11 May 2020, globalnutritionreport.org/resources/nutrition-profiles/africa/eastern-africa/eritrea/.

"Eritrea." *UNICEF*, www.unicef.org/appeals/eritrea.html.

"Eritrean War of Independence." *Eritrean War of Independence - New World Encyclopedia*, www.newworldencyclopedia.org/entry/Eritrean_War_of_Independence.

"Genetically Modified (GM) Crops: Techniques and Applications - 0.710." *Extension*, 7 Mar. 2016, extension.colostate.edu/topic-areas/agriculture/genetically-modified-gm-crops-techniques-and-applications-0-710/#top.

"In-Depth." *UNDP in Eritrea*, www.er.undp.org/content/eritrea/en/home/ourwork/womenempowerment/in_depth/.

Naam, Ramez. "Why GMOs Matter - Especially for the Developing World." *Grist*, Grist, 30 Jan. 2014, grist.org/food/why-gmos-do-matter-and-even-more-to-the-developing-world/.

"Sustainable Agriculture Practices." *Union of Concerned Scientists*, www.ucsusa.org/resources/sustainable-agriculture-practices.

"The War Between Ethiopia and Eritrea." *Institute for Policy Studies*, 8 May 2014, ips-dc.org/the_war_between_ethiopia_and_eritrea/.

"The World Factbook: Eritrea." *Central Intelligence Agency*, Central Intelligence Agency, 1 Feb. 2018, www.cia.gov/library/publications/the-world-factbook/geos/er.html.