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World Food Prize: Malnutrition in Ethiopia

The world-renowned agronomist and architect of the “Green Revolution” Norman Borlaug once said that, “Civilization, as it is known today, could not have evolved, nor can it survive, without an adequate food supply.” Yet the biggest problem facing civilization today is not one of an inadequate supply of food, but rather an inadequate supply of nutritious food combined with the inability to supply food to the world's population centers. Though the distinction between these two seems small, it holds the key to a sustainable food future.

The country of Ethiopia has been blighted by malnutrition in recent years with an estimated 38% of children in Ethiopia having stunted growth due to malnutrition. In recent years the global community has come together to solve the issue of malnutrition and hunger. For example, all United Nations member states approved of Sustainable Development Goal 2 or the “Zero Hunger” goal, which calls upon nations to eradicate hunger. But countries like Ethiopia are still struggling to meet this goal and are not on track to meet the goal by 2030. In 2015, the Ethiopian government gave the Seqota Declaration, in which the Ethiopian government committed to ending stunting in children under two by 2030. Though the Seqota Declaration was an extremely important step on the road to ending malnutrition, much work remains to be done for Ethiopia to meet the commitment outlined in the declaration.

According to the United Nations Food and Agriculture Organization, the current rate of global food production is enough to feed 1.5 times Earth’s population, which equates to 11.5 billion people (FAOSTAT). Despite this, over 820 million people across the globe are undernourished. In fact, 1 in 5 children “under the age of 5 have ‘stunted’ – they are significantly shorter than the average for their age, as a consequence of poor nutrition (Roser)”. Though many countries across the globe suffer due to an inadequate supply of nutritious food, Ethiopia has in recent years become a poster child for countries where government mismanagement, poor land-use practices, and climate conditions have combined to create a starving populace. Ethiopia ranks among the top 5 countries in malnutrition and has made very little progress in improving this metric in the past decade. However, Ethiopia has the capability to change this situation by building partnerships between the government and farmers, expanding agricultural infrastructure, and implementing better land-use practices.

Ethiopia is a landlocked country located in the Horn of Africa with a population of 112 million people. The capital is Addis Ababa. Ethiopia borders Eritrea, Djibouti, and Somalia to the east, Kenya to the south, South Sudan to the west, and Sudan to the north. It is considered one of the growing economies of Africa with a current Gross Domestic Product of 95 billion USD. Ethiopia is a parliamentary republic currently led by Prime Minister Abiy Ahmed who took office in 2018. The agriculture sector accounts for 47% of Ethiopia's Gross Domestic Product and 80% of the country’s workforce is employed in the agricultural industry. The average farm size in Ethiopia is 2.22 acres. This is smaller than its neighbor Kenya which has an average farm size of 6.18 acres and is minuscule compared to the average farm size in the United

States of 444 acres. Ethiopia possesses a cultivated land area of 6 million hectares which is 5% of the total land area. However, a report by the Food and Agricultural Administration (U.N.) found that this land-use pattern represents less than half of the total cultivable land found in Ethiopia, which is approximately 13 million hectares.

A variety of climates and geographic features can be found within Ethiopia, which presents both challenges and advantages to agriculture. Ethiopia is located within the tropics, but its nearness to the equator means that the descending Hadley cells (atmospheric currents) contribute to near-permanent hot and dry conditions. However, there are rainy seasons from February to April and June to September. Ethiopia's largest river is the Blue Nile and the construction project for the Grand Ethiopian Renaissance Dam on the Blue Nile has provided an important job and economic opportunity for the country. Aside from the Nile, Ethiopia has 8 rivers and 12 large lakes which provide water for irrigation, household use, and transportation.

The country remains in the preliminary stages of the demographic transition model, with a high birth rate and a high mortality rate. A majority of the population is under the age of 65, with 42% of the population being under the age of 15. The average life expectancy is 45 years. The relatively low average life expectancy is primarily due to malnutrition, lack of health care accessibility, poor sanitation methods, and food insecurity. Disease has also ravaged much of the country in recent decades, with the HIV/AIDS epidemic wreaking havoc on local populations. According to the most recent United Nations estimates Ethiopia will have a population of 205 million people by 2050. The current average household in Ethiopia consists of 5 members.

Like most developing countries, Ethiopia has a wide gap between urban and rural livelihoods. Rural homes are constructed from mud and mortar and have thatched roofs, while the urban centers have high rises and modern homes. Energy use patterns in Ethiopia are similar to that of most developing nations, in that there is little access to electricity and that biomass remains the main source of energy. According to a 2020 research article by Elias Getie, only 46% of Ethiopians use electrical energy for day-to-day activities like food preparation, and other tasks. Most Ethiopians in both rural and urban areas have access to fuel for cooking, typically biomass in rural areas and electric or gas-powered in urban areas. One concern with biomass combustion in rural areas has been the increased risk of lung cancer due to low ventilation in homes. Agriculture still presents the largest employment opportunity in Ethiopia with 76% of employment-based in the Agricultural sector. In contrast, the services sector makes up only 15%, while the industrial sector makes up 9% of all employment.

The average Ethiopian diet also varies greatly from urban areas to rural areas. In urban areas the consumption of meat is quite common, however, in rural areas livestock is primarily used for dairy products such as milk and therefore meat is rarely consumed. Cereals such as Sorghum and wheat, along with Potatoes serve as the backbone of the Ethiopian diet. However, the consumption of vegetables in rural areas is rare due to inadequate access and insufficient supply. Almost half of Ethiopia's population suffers from some form of undernourishment due to a lack of essential vitamins and nutrients. A particularly damaging vitamin deficiency has been the lack of iodine in an average Ethiopian diet.

In Ethiopia, malnutrition is primarily due to the lack of sufficient consumption of 4 vitamins: Vitamin A, Zinc, iron, and iodine. This combined with a lack of sufficient calories per day has led to food poverty which plagues most of the country. The most efficient and effective way to solve this issue is to create a national diet program, which stresses the importance of consuming specific foods, which have a high concentration of the aforementioned 4 vitamins, and the promotion of this plan throughout the country. Ethiopia has already created the National Nutrition Program (NNP), which is a program aimed at working with different sectors of the government to decrease malnutrition rates. The program primarily functions through the collection of data on malnutrition, to provide the government and NGOs with the most up-to-date information on the situation. This data can then be used by the government to recommend and implement policies under the NNP. Though the process of data collection is extremely important, it is largely a reactive step, rather than a proactive step. Instead, the government should consider implementing a national diet program under the NNP. This program would not only work to alleviate current cases of malnutrition but would also help to prevent future cases from developing. This type of program has already been implemented in the United States and the United Kingdom, where their respective governments have created programs such as MyPlate and MyPyramid which provide people with suggestions on not only what their daily caloric intake should be, but also what specific foods and nutrients they should consume. This diet should take into consideration the economic standing of specific regions, religious or cultural customs and dietary restrictions, and the food available to different areas. The creation of a flexible diet will allow for different regions to create different diets. This is important as some issues are common across the entire country, while some aspects are region-specific. Therefore, any plan should consider such regional oddities.

However, some problems are widespread, such as iodine deficiencies. This problem could be addressed through the proliferation of Iodized Salt. The implementation of Iodized Salt will be easier in urban centers such as Addis Ababa. For the rural areas, the government should consider creating a public-private partnership with the local salt manufacturers to add the necessary iodine to all salt. Strong regulatory frameworks mandating the sale of Iodized salt, and limiting the amount of non-Iodized salt may be needed to increase compliance from manufacturers. Building an awareness program is also essential to overcome any stigmas associated with processed food. To solve the Vitamin A deficiency, we need to educate the farmers and consumers to move away from standard potato growing and shift to Sweet Potato farming. Sweet potatoes have a 107% daily value of Vitamin-A, while a regular potato has only 0.1%. We know that Ethiopians consume potatoes as a staple diet, so making this switch to sweet potatoes will solve a key malnutrition issue.

Many Ethiopians are vegetarians, so one way to solve the issue of iron deficiency is by encouraging the use of green vegetables, predominantly Spinach. In addition to this, adding Soybeans to a regular diet will help to further alleviate the issues posed by a lack of iron in the average diet. Considering that Ethiopia has relatively low Soybean production, much of it will need to be imported to Ethiopia. Along with soybeans, a regular diet of chickpeas will help decrease the number of zinc and iron deficiency cases. Ethiopia also has a good dairy consumption pattern and this can be leveraged to improve daily consumption of milk and milk-based products. The government of Ethiopia can take cues from other nations such as India, which launched the program “Operation Flood” in the 1970s, which led to a major increase in

dairy production. A similar program in Ethiopia will help to increase dairy production and consumption, which in turn will lead to decreased malnutrition.

Another major issue with global food poverty is the issue of food insecurity. Food insecurity is defined as the lack of consistent access to enough food for every person in a household to live an active and healthy life. Food insecurity is especially prevalent in poorer regions such as Sub-Saharan Africa and Southeast Asia. The three main factors contributing to food insecurity are government mismanagement, accessibility, geography, and climate. The first of those problems is common mainly in less developed countries where government corruption has led to the mismanagement of food resources. This can be solved through oversight agencies invested with the power to root out corrupt officials and organizations. Furthermore, countries that provide Ethiopia with aid could place conditions on that aid such as requiring corruption to be investigated. This has already worked in countries like Singapore, where rooting out government corruption has been a key focus of the government, and NGOs providing aid to Ethiopia could follow a similar approach.

With regard to the issue of food accessibility, one of the most important steps is for the government to invest in local farms and farmers. Additionally, governments should offer subsidy programs for farmers that grow crops that are less common. For example, in Ethiopia where nutritious vegetables are rare, the government should consider subsidizing and aiding farmers who grow vegetables and other non-staple crops. Furthermore, investment in the building of storage depots (both dry storage and cold storage) is essential for proper warehousing of food grains and their distribution. In the past, these distribution centers have been placed near major urban centers, but future policies should look to shift these warehouses to locations that are easily accessible by rural populations.

Thirdly, concerning climate and geography, the government of Ethiopia should work to set up infrastructure that can help to curtail the influence of climate and geography on areas. For example, Ethiopia has long struggled with the issue of arid farmland, and to counter this problem, the government should invest in irrigation mechanisms. Additionally, in areas with soil currently unusable for farming the government should call upon soil management experts to determine the best practice for farming the given area of land. For instance, if the soil is devoid of Nitrogen, a necessary nutrient for all plants, then the government should consider promoting and implementing cover cropping techniques. Cover cropping can help to return Nitrogen and other vital nutrients to the soil and help restore the farming capacity of the land. Another solution to Ethiopia's lack of arable land is to fund a survey of potential farmland. This is especially important in countries like Ethiopia, where only half of the land area available for farming is currently used.

The final factor in decreasing food insecurity is decreasing poverty. This can be done only through a sustained government initiative that deals with all sectors of the economy, not just agriculture. This is important because the amount of money a person makes directly determines the quality and quantity of food they can access. Furthermore, NGOs must provide additional support to nations that lag on food insecurity. The 2007-2008 Food Price Crisis in particular highlighted how interconnected the global food economy is. An environmental crisis in a small and isolated region can have repercussions that aggregate into a global crisis. To prevent such a

crisis in the future, the alleviation of food insecurity must occur uniformly, instead of leaving some countries behind.

Though many of these plans may be expensive, countries such as Ethiopia can call upon a variety of organizations such as the International Monetary Organization, the World Bank, and the United Nations Development Fund to help finance these initiatives. Despite the plethora of global financial options, most of the financial backing for this plan will need to come from the Ethiopian government. Private low-cost micro-financing for farmers could also provide farmers with money to purchase equipment and new seeds. These programs provide a low risk opportunity for farmers and when placed under government oversight, have shown great promise. Through these actions, Ethiopia should be able to fund the above initiatives.

To oversee the initiatives and programs outlined, the Ethiopian government should consider setting up a governmental commission. This commission could oversee initiatives such as the Iodized salt program and could also facilitate international aid within Ethiopia. The commission will also need to work with local governments to develop solutions that work in specific regions, whilst also coordinating national efforts with the central government. Furthermore, this program will need to have independent oversight to prevent corruption and other forms of malfeasance. This commission would also need to be vested with emergency powers, to step in swiftly and efficiently in the event of a food crisis in a certain region. Especially in a developing country like Ethiopia, the central government is saddled with countless problems, often meaning that issues such as malnutrition are not dealt with appropriately. A governmental commission, as outlined, would be able to devote more time and resources to the issue of malnutrition.

In conclusion, the issue of global food insecurity and malnutrition is one of the most pressing concerns across the developing world. This will be aggravated in the coming 20-30 years due to various factors such as population migration to urban areas, degradation of farming land & techniques, and climate change. So there is an urgent need to address global food insecurity before it becomes a larger global issue. A comprehensive plan combined with multi-year roadmaps and a public-private partnership at various levels of the country will be key to addressing this issue. Organizations such as the United Nations, World Food Program, and World Health Organization need to take an active interest in helping to equip countries with the necessary tools, techniques, investments, and education in mitigating this problem.

Annotated Bibliography:

Rönnlund, Anna Rosling, et al. *Factfulness: Ten Reasons We're Wrong About the World - and Why Things Are Better Than You Think*. United Kingdom, Flatiron Books, 2018.

This book by Hans Rosling showcases how the world is better than we first think. Throughout the book Rosling discusses how his own experiences have taught him that humans are wired to believe in hyperbole, and that the world is actually better than we think. However, Rosling also goes on to point out that there is still a long way to go before we can say that the noble goals of ending childhood hunger and global poverty have been met. I found the book especially helpful in my research because it showed me the effectiveness of some of the hunger reducing initiatives of the past. Rosling also presents a framework for devising solutions that helped write about potential solutions to Ethiopia's malnutrition problem. Rosling's view can best be summarized as stating that the world is better than you think it is, but that suffering and pain still exist all around us.

Robinson, James A., and Acemoglu, Daron. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. United Kingdom, Crown, 2012.

This book explains some of the many factors that influence whether a nation is rich or poor, not just with regard to money, but to citizens' health and food security. This book can help to explain why some countries like Ethiopia struggle, while others thrive in today's society, and provides some controllable factors that could influence future development patterns.

Central Intelligence Agency, Central Intelligence Agency, www.cia.gov/the-world-factbook/countries/ethiopia/.

This is a link to the CIA factbook that maintains a near complete set of data on Ethiopia and every other country. This website was very helpful in providing a general understanding of Ethiopia and its current situation. It provides data on demographics, economics, and internal affairs.

Shattuck, Annie. "We Already Grow Enough Food for 10 Billion People... and Still Can't End Hunger." *Food First*, 1 Jan. 2012, foodfirst.org/publication/we-already-grow-enough-food-for-10-billion-people-and-still-cant-end-hunger/.

This article discusses the fact that we already grow enough food to feed the entire global population, but that we fail to do so due to issues such as food distribution. It shows how the Green Revolution helped to end the issues surrounding quantity, but brought about other questions, such as how to transfer food grown in breadbaskets to regions that need food the most. Overall, this

article helped me realize that the hunger issues facing the globe today are not ones of quantity, but ones of distribution.

“World Hunger: Key Facts and Statistics 2021.” *Action Against Hunger*, 12 Jan. 2021, www.actionagainsthunger.org/world-hunger-facts-statistics#:~:text=The%20proportion%20of%20undernourished%20people,million%20people%20globally%20are%20undernourished.

This article presents the key facts surrounding world hunger. I relied on it to provide the underlying statistics on the status of world hunger to serve as the bedrock for my paper.

Max Roser and Hannah Ritchie (2019) - "Hunger and Undernourishment". *Published online at OurWorldInData.org*. Retrieved from: '<https://ourworldindata.org/hunger-and-undernourishment>' [Online Resource]

This article discusses the fact that though the United Nations has set a Sustainable Development Goal of ending global hunger by 2030, that the world is far from reaching this goal. Roser and Ritchie also present the underlying causes of this failure and steps we can take to rectify the current situation.

Ch25 - ETHIOPIA - GEOGRAPHY, POPULATION AND WATER RESOURCES.
www.fao.org/3/v8260b/V8260B0s.htm#:~:text=The%20cultivated%20land%20is%20about,State%20farms%20and%20Producers'%20Cooperatives.

This article gives a summary of Ethiopia's geographic disposition and its natural resources such as bodies of water. It is extremely important to understand the geography of a country when analyzing the land use practices of a country, and this article also allowed me to understand some of the land use patterns in Ethiopia.

Nutrition Country Profiles: Ethiopia Summary,
www.fao.org/ag/agn/nutrition/eth_en.stm#:~:text=The%20Ethiopian%20diet%20is%20mainly.%20C%20pulses%20and%20oil%20seeds.

This article provided me with an excellent background on the average Ethiopian diet and the potential problems with that diet. One of the biggest issues that is discussed is the lack of iodine in the Ethiopian diet and how it has caused an increase in cases of Goiters and other Thyroid related issues.

“Jobs.” *DataBank*, databank.worldbank.org/reports.aspx?source=jobs.

This chart provided me with data on the various job sectors in Ethiopia. Including information on which sectors produced the most profits for individual workers, which jobs were associated with increased standards of life, and which sectors contributed the most to national metrics such as GDP and employment.

Getie, Elias Mandefro. "Poverty of Energy and Its Impact on Living Standards in Ethiopia." *Journal of Electrical and Computer Engineering*, Hindawi, 23 July 2020, www.hindawi.com/journals/jece/2020/7502583/. - Chart about poverty in Ethiopia

I found this article useful, despite the fact that it did not specifically focus on hunger. The article talks about how poverty in Ethiopia has led to the poor living conditions found in the country today. One part that I focussed on for my specific research, was the means of cooking for most Ethiopian's. Electricity is exceedingly rare in Ethiopia, meaning that most people have to rely on biomass for cooking and preparing their food. This has led to increased rates of lung cancer among Ethiopian's due to the particulate matter released during biomass combustion.

Syngenta. "Trending 2050: The Future of Farming." *Trending 2050: The Future of Farming | Syngenta Thrive*, <https://www.syngenta-us.com/thrive/research/future-of-farming.html>.

This article discusses how farming techniques must improve in order for a sustainable food and farming future. I used it during my research on solutions for the issue of malnutrition in Ethiopia. Though the article is not specific to Ethiopia, it does provide general solutions that could be implemented in a majority of countries given proper funding. The funding for such expensive initiatives could be directed from the World Bank Development Fund and other United Nations led programs.

"Working to End Malnutrition in Ethiopia – It All Starts with Financing." *Results for Development*, 6 Jan. 2021, r4d.org/projects/working-end-malnutrition-ethiopia-starts-financing/.

This is another article that discusses the specific issue of Malnutrition in Ethiopia. However, this article offered me a different perspective because it focuses mainly on financing and how to solve the issue through investment.

"Nutrition." *UNICEF Global*, www.unicef.org/ethiopia/nutrition.

This is a general U.N. article on nutrition in Ethiopia and provided me with valuable resources for my facts.

Yirga, Ashenafi Argaw, et al. "Factors Affecting Child Malnutrition in Ethiopia." *African Health Sciences*, Makerere Medical School, June 2019, www.ncbi.nlm.nih.gov/pmc/articles/PMC6794502/.

This article discusses the different problems causing the issue of child malnutrition. This article relates back to the Seqota Declaration by the Ethiopian government.

"Country Nutrition Profiles." *Global Nutrition Report | Country Nutrition Profiles - Global Nutrition Report*, globalnutritionreport.org/resources/nutrition-profiles/africa/eastern-africa/ethiopia/.

This article was also on nutrition Ethiopia, however, it was more in depth and thorough than the UNICEF article on nutrition. It had lots of charts and data which helped to conceptualize and understand the data in a much more comprehensive fashion.

“Nutrition: 6. Common Nutritional Problems in Ethiopia.” *Nutrition: 6. Common Nutritional Problems in Ethiopia: View as Single Page*, www.open.edu/openlearncreate/mod/oucontent/view.php?id=319&printable=1.

This article was another resource I used to understand the malnutrition crisis within Ethiopia and the various factors contributing to it.

Ajuma, Abigael, and Michael E. O'Hanlon. “How the UN Can Solidify Ethiopia as an African Success Story.” *Brookings*, Brookings, 29 July 2021, www.brookings.edu/blog/order-from-chaos/2021/07/28/how-the-un-can-solidify-ethiopia-as-an-african-success-story/.

This article from the Brookings Institute highlights the current political situation in Ethiopia. Though it is not directly related to malnutrition, it is helpful to understand the political circumstances in Ethiopia when considering any solution to malnutrition. The war in the Tigray region has led to a famine in some areas, highlighting the interconnectedness of global food systems.

Kagan, Julia. “Microfinance Definition.” *Investopedia*, Investopedia, 16 Aug. 2021, www.investopedia.com/terms/m/microfinance.asp.

This article from Investopedia provides a general overview of Microfinance and Micro-credit. I believe that Ethiopia could promote private microfinance in order to provide farmers, agricultural suppliers, and others with the necessary funding to carry out the initiatives I have laid out.

Daniel Gebregiorgis Climate scientist. “The War in Tigray: The Makings of a Man-Made Famine, and What Can Be Done.” *The Conversation*, 6 Aug. 2021, theconversation.com/the-war-in-tigray-the-makings-of-a-man-made-famine-and-what-can-be-done-165406.

This article concerns the declaration by the United Nation officials that, “There is now famine in Tigray.” This article provides information on actions taken by the Ethiopian government and other groups in the Tigray region that have led to the famine. Secondly, the article discussed “land rehabilitation” initiatives and discusses the long term effects of famine. This article is helpful in showing the connectedness of food systems, the long term effects government policies can have on food security, and how fixing food insecurity is a long and difficult road.