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Eritrea, Water Scarcity and Sanitation
Battling the Water Crisis in Eritrea

Kofi Annon once said, “We shall not defeat any of the infectious diseases that plague the developing world until we have also won the battle for safe drinking water, sanitation, and basic health care.” Water is a basic necessity for life that millions of people take for granted. Around 785 million people don’t have access to water worldwide(CDC). Nearly 2.8 million people in Eritrea lack basic water services(World Vision). This is a significant problem because most people are devoting their time to finding water to survive. There is a lack of education about contamination and sanitation which creates serious problems for those that don’t know the consequences.

Eritrea’s population is 3.6 million people(World Population Review). About 60% of its population is in rural areas compared to an average 10% in other core countries(Trading Economies). Only 40% of the population lives in urban areas compared 82% in the United States(Trading Economies). This means most people are practicing subsistence farming. Eritrea’s government is a presidential system, but they only have one party called *The People's Front for Democracy and Justice*. The average farm size in Eritrea is .49 acres compared to 444 acres in the United States(Ravinder). Eritrea doesn’t have the water supply or space for the size of the farm in which the United States commonly has. The climate is either hot, semi-arid, or hot desert climate which makes it hard to maintain certain plants. The average rainfall is thirteen inches per year. Eritrea goes through major droughts which impacts the farming for families. Approximately 26% of the land is arable, but only 4% is being used(World Bank). The major crops consist of sorghum, millet, barley, wheat, legumes, vegetables, fruits, sesame and linseed. The major exports are livestock, sorghum, textiles and food. Eritrea has many problems now, but is getting assistance from many organizations to help them someday flourish.

A typical family size is 4.8 people which is relatively small for a developing country. In rural areas, the houses are built with wood, straw and stone. Many of them lack running water and plumbing. In urban areas, the houses are made from concrete blocks and wood. Families typically eat what they raise including goats, cattle, sheep, pigs and chickens. Despite Eritrea being located near the Red Sea, most people don’t eat fish. The base of most meals is either kitcha – a thin wheat bread – or injera – a spongy pancake made from taff(The Borgen Project). Most meals are eaten out of a communal bowl. Majority of farmers practice subsistence farming and grow crops specifically for the family. Meals are cooked several ways, but the most popular is a stew. About 80% of jobs are in agriculture, which is 60% higher than the average for all countries around the world. The remaining 20% of jobs are in industries such as beverages, cement, clothing and textiles, food processing, and light manufacturing(World Factbook). A major barrier a typical family will face is poverty due to very low yearly income. A typical yearly wage is \$740. Eritrea ranks 76 out 108 on the UNDP Human Poverty Index Scale(World Health Organization). Almost 52% of the population is under the poverty line. More problems stem from lack of education for sanitation, poor use of land, and lack of essential resources such as water and food. The government requires children ages 6-14 to enroll in school for basic education. Enrollment rates are very low due to unstable grounds caused by flooding and droughts. All families have access to healthcare since it is government induced and free for everyone. For families in rural areas it can be hard to access medical facilities, but numbers have increased in recent years including doubling the number of physicians from 3 per 100,000 people to 6 per 100,000 people. Majority of urban areas have access to electricity, but overall 80% people lack basic water services and 50% lack clean water. Nearly 77% of the country practices open defecation. This can lead to many sanitation issues, possible diseases, and infections. The roads are generally in good

condition. There are also no functioning rural markets in Eritrea which can make it hard for people to get basic needs easily. However, there are markets in urban areas including the largest city in Eritrea called Asmara.

According to the World Health Organization, only about 22% of the rural population has access to safe water. The ongoing four year drought has aggravated the situation; water levels in wells and boreholes are at an all time low. The severity of this topic is extreme. Nationwide, 54% of the population is without access to safe water. That being said, citizens perform everyday tasks in public water sources like streams because water is not accessible from home. Overtime, the water will become contaminated when it is used for dual purposes such as cooking and showering. This contamination can lead to fatal diseases. Diarrhoeal is the most common disease that spreads through water. It is a bowel infection that causes people to lose over 10% of water in their bodies and is the leading cause of death for children under the age of five(CDC). Another disease is Cholera, which can be deadly due to diarrhea causing severe dehydration(The Borgen Project). However, with the recent help of UNICEF partnering with Eritrea's State Government, there are improvements taking place. There is a goal known as The Millennium Development Goal (MDG), which aims to increase accessible clean water and promote safe WASH practices in drought-prone areas of Eritrea. UNICEF is also working to connect many schools to community water supply systems.(The Borgen Project). In 2022, UNICEF has a 13.7 million dollar plan that includes helping 60,000 people gain access to a sufficient amount of safe water.

The rural areas of Eritrea have taken the bigger hit compared to urban areas. However, the water demand is expected to increase for those in both rural and urban populations because of increasing population, economic activity, and rapid urbanization. For rural specifically, water is vital for progression and farming. Wells are drying making the walk longer to the nearest water source. For urban populations, the demand for fresh water is rapidly increasing due to urbanization and the lack of basic functional water infrastructure. Each gender is affected differently. Women have to walk long distances to find water for cooking, and most times the water is contaminated from all other families using it for different purposes. When farming, it is hard to grow crops with long drought seasons and little available water. Men are forced to focus on trying to get enough water to grow food for their families. Children take long journeys with their mothers to help get more water. This is unfortunate because it is taking away time for education. The lack of education can be detrimental to the future of Eritrea because there will be less qualified workers when the children grow up. This is a major setback for the development of the country. Above all, the elderly population heavily relies on the adults and children to take care of them since most of them are no longer able to walk several miles in the heat to carry heavy water. The total dependency ratio is 83.9, with children at 75.6 and the elderly at 8.3.(CIA World Factbook). This means there are more children than elderly because of the lower life expectancy. The average life span is 78.6 years old, but in Eritrea it is only 66.3 years. This contributes to the placement in the low category for the Human Development Index positioning Eritrea in 180 out of 189 for countries and territories(Human Development Reports). Many marginalized people are overlooked or discriminated against, which makes it harder to gain access to water. There are around 150,000 refugees in the country. This number puts high stress on the already elevated demand for water. With the lack of rainfall and water, it causes issues with farming and can heavily impact the environment when crops and plants aren't able to grow. Also, with large amounts of the country practicing open defecation, the environment is being harmed by human waste not being properly disposed of. It can lead to water pollution with rainwater flushing the feces into unprotected wells and rivers. Simple fixes in lifestyle can make a significant difference.

One short term solution to these problems is education. Part of the reason contamination happens is because people are unaware of the consequences such as fatal diseases. The child mortality rate is 40.5

deaths per 1,000 live births(UNICEF). That is extremely high compared to a developed country such as the United States whose child mortality rate is only 6.5 deaths per 1,000 live births(CDC). A significant number of those deaths can be prevented. Promotions in school, rural villages, and in major cities of proper sanitation to spread awareness can immediately bring down death numbers. An example of a country that has incorporated spreading awareness to specific causes is Bangladesh. With major issues associated with overpopulation, experts went from village to village, and to different schools to offer free contraceptives, birth control, and provide education about the reasons for promoting lower birth rates. It has had a significant impact on the country, reducing population growth from 6.95 total births per woman in 1970 to 2.06 births per woman in 2017(PubMed). There has also been an increase in use of contraceptives from 7% to 54% today. Birth rates are dropping drastically which is good because overpopulation contributes to over saturated agriculture and a higher demand for food and water. Eritrea can model off of Bangladesh's solution to lower birth rates by having an expert inform and demonstrate ways to improve sanitation. UNICEF can incorporate funding and send educated people to Eritrea to different villages. Overall, the cost wouldn't be expensive for the total benefit education can bring. It would lead to cleaner rivers, wells, and boreholes. This is crucial to prevent diseases spread by water including Cholera and Diarrhoeal.

A longer term solution to the problem are sand dams. Kenya, a country south of Eritrea has used this technique to combat their water scarcity and sanitation problems. It is a very low cost, low maintenance technology that retains rainwater and recharges groundwater(The Water Project). Over 947,000 people across Africa have benefited from 1,000 sand dams(Excellent Development). It is constructed across ephemeral streams which only flow during or after rainfall for a short duration of time. The only river that is not ephemeral in Eritrea is the Setit River(UN Global Compact). Rain is the primary source of water in the country. During the rainfalls, water that's stored in the sand of the ephemeral stream accumulates behind the dam. Then it provides communities in drylands with water even when there is a drought. Inside the sand dam water is accessed by scoop holes, pools, and shallow wells. Another benefit is it reduces evaporation, shields the water from disease carrying mosquitoes, and filters the water so it's usable. It also helps vegetation grow and is an effective way to regenerate land. A disadvantage of this technology is labor intensive and most local communities cannot implement it without external aid(Sand Dams- Appoprendia). Another drawback is if dams are built across rivers that also flow through other countries, it can create tension. The upside is that the cost is only \$7,500 per sand dam, and it can last up to fifty years. One dam also provides 1,000 people with water if there isn't rainfall for a year. With rainfall, it can provide water for up to 3,000 people. Organizations like UNICEF and the government would need to be involved for funding and building. Maintenance and construction would involve foriegn help from UNICEF and people from the village to keep it running. Specific policies would need to be in place to make sure everyone who is using it or involved gets equal shares. For example there would be a limit on how much water should be used in a week per family. Eritrea is a patriarchal society meaning women are not treated as equally as men, and is deemed normal. This needs to be considered while constructing the sand dams because it will be primarily men building and maintaining the dams. However, the project is still sustainable because it creates a year round water supply, it's cost effective and low maintenance after construction, and overtime will increase food production(Excellent- Pioneers of Sand Dams).

Clean and accessible water is the key to ending food security. Each day, 25,000 people die from hunger and related causes(UN). Having a stable source of enough water means more can be put towards growing crops and raising livestock. However, currently the majority of clean water is used for basic hygiene just to survive. Less people will go hungry with effective agricultural processes but none of that is possible without a stable source of water, all possible from the implementation of education and sand dams.

Four million. That is the approximate worldwide annual death rate for water scarcity and water related diseases. Four million people leave their families devastated by the fact their death could have been

avoided. We take for granted simple tasks such as turning on a faucet or flushing a toilet. Millions of people would die to have the life we live today. We have the power to make the change in this world to help bring the water crisis to an end. The Eritrean government and organizations like UNICEF continue to provide change tackling one issue at a time. It can be as simple as educating the population. As long as we continue this fight against the water crisis, the more lives we will save each year.

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