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Somalia, Water Scarcity

## **Drought Augmenting Water Scarcity in Somalia Impacts Food Security**

The origin of food and water are often forgotten and neglected topics among Americans. The abundance of these advantageous commodities diminish the internal drive of self preservation as food is so easily accessible. This subject matter, however, is the main concern for many people in underdeveloped or even developing countries. Food and water are not resolute items; they might not be there the next day or week. Water scarcity issues that are severely exacerbated by increasingly more frequent droughts and shortages of arable land have deprived many people of required nutrients for a healthy lifestyle.

In Somalia, an underdeveloped country in the Horn of Africa, food insecurity is a constant menace. With a total of 157.568 million acres of land, slightly smaller than Texas, Somalia has a mere 2.836 million acres of arable land to feed their growing population of currently 11,757,124 people (Central Intelligence Agency [CIA], 2020). This issue has been magnified by the severe droughts and little rain in recent years. Even Somali families with adequate and plentiful food sources are impacted, as the economy is heavily agrarian based. Three fifths of Somalia's economy is agricultural, however the majority of this contribution is from raising livestock (Lewis & Janzen, 2020). Despite the sanguine outcome for the economy, the raising of livestock consists of its own setbacks regarding water scarcity and food security as the animals themselves require nutrients to be suitable for consumption.

Somali families are traditionally close knit and caring. The structural groups are often comprised of three generations including, but not limited to, the eldest couple, their sons, their sons' wives, their unmarried daughters, and any grandchildren (Evanson, 2019). 53.9% of people in Somalia live in rural areas with little access to technology, sanitation, continuously clean water, or a variety of nutritious foods (CIA, 2020). Additionally, with a low hourly average wage of around \$2.58 compared to \$42 in the United States, according to the website *Salary Explorer*, families are unable to pay for things Americans take for granted or for the transportation to these items. Compounding this problem is the lack of education. Only 30% of children in Somalia are enrolled in primary schooling, with only 40% of those children being girls ("Education in Somalia", n.d.). Dietary diseases frequently materialize from a lack of education on how to properly store and prepare nutritious food with the resources available.

In recent years, Somalia has been hit with severe droughts and lack of rain during rainy seasons in correlation with climate change and increasing global temperatures. Friedrich-Wilhelm Gerstengarbe, a senior scientist at the German Potsdam Institute for Climate

Impact Research, noted, “The present drought in the Horn of Africa has been provoked by El Nino and La Nina phenomena in the Pacific Ocean, which unsettle the normal circulation of warm and cold water and air, and dislocate the humidity conditions across the southern hemisphere,” (as cited in Godoy, 2011). The El Nino and La Nina phenomena take place throughout the tropical Pacific every five to seven years; they are a part of the oscillation climate pattern that alters surface temperature of the tropical eastern Pacific as well as the air surface pressure in the western Pacific. Gerstengarbe continued, “El Nino and La Nina exacerbate the weather conditions across the southern hemisphere, escalating the rainy season in some areas, especially in Asia and Australia, and droughts in others, especially in Africa” (as cited in Godoy, 2011). The droughts in the Horn of Africa have been brought on due to specifically the La Nina phenomena which decreases the water temperatures in the equatorial central Pacific Ocean, in turn stifling cloudiness and rainfall primarily during the rainy season between November and April. The absence of rainfall melded with the increasing fiery temperatures have brought on the most distressing drought in the Horn of Africa in nearly sixty years (Godoy, 2011).

The ongoing drought in Somalia has become a devastating plight primarily due to the absence of sufficient water resources. 30.4% of the urban population and 91.2% of the rural population in Somalia have an unimproved, unprotected, or temporary water supply that is inadequate (CIA, 2020). Many of these inferior water sources are sparse, and due to a lack of infrastructure claim an excessive amount of time to walk to and collect to provide for commonly large families. This daily task usually falls upon the women and children of the family, preventing them from gaining education or pursuing careers. The task of collecting water is extremely labor intensive, and women and children must make this trek daily. A round trip for water commonly consists of about 3.7 miles of walking barefoot; women and children must repeat this task multiple times a day to provide for their families (Reid, 2020). With a full jug in each hand, plus the twenty liter jerrycan balanced on their head, women carry around sixty pounds of water back with them each trip. This can lead to lifelong back and neck problems that can pose major health concerns.

Once water is acquired, the cleanliness of the precious commodity is frequently overlooked as families are uninformed of proper sanitation techniques and practices to minimize disease outbreaks. According to the editors of Oxfam International (2014), “Only 30% of Somalis have access to clean water, leaving the majority vulnerable to several life threatening diseases... like Acute Watery Diarrhea (AWD), cholera and polio”. These diseases can be fatal or have lasting effects on people’s health. This situation is worsened further by a lack of education on basic sanitation techniques. Many Somali people fail to connect or associate the diseases they are contracting to the water they are consuming. Because of this, they continue to drink the foul water and, unknowingly, the diseases that thrive in the impure water. Additionally, because of how sparsely available water sources are, Somalis have no choice but to consume the water vitiated by waterborne diseases and dirt. Death by dehydration is certain if humans go without water for more than a few days. Although people can go several weeks without food, they still need to eat, and plants and animals that provide adequate sustenance for people also need

water to live. This rations the available water between three parties for the benefit of one. The current ongoing drought combined with a little supply and great demand for water has placed the Somali people in a precarious state. Without substantial water sources, food insecurity is inevitable as water is vital to the plants and animals that provide people with passable if not ample nourishment.

Escalating the situation in Somalia further is the country's inability to address these issues due to struggling economic circumstances. "In central Somalia, which has been most devastated by the drought and fighting, camel, goat, sheep, and cattle herds have been wiped out, leaving nomads with no income" (Wood, 1993). Pastoralism, traditionally known as raising and moving livestock in herds depending on available resources, is an important economic factor in Somalia. However, due to the general lack of resources brought on by the incessant drought many pastoralists or nomads have been left with no income. Not only is each pastoralist and their family impacted, but the economy as well because the amount of individuals contributing to the economic status is decreased. Further compounding the economic struggles is the ongoing civil war in Somalia. "Since the fall of dictator Mohamed Siad Barre in 1991... Somalia has mostly remained in a state of anarchy, without a functioning central government" (DARA International, 2010). According to Dr. EJ Hogendoorn (2020), the Somali government has greatly progressed and improved since 2010. However the situation is still incredibly unstable and could easily move in the wrong direction. The relatively weak government is still working towards unified control and peace for the Somali people. Citizens, therefore, cannot rely on the government to solve the water crisis until the conflict is resolved. The strain of resources, combined with the limitations of internal financial aid, has compelled organizations and other countries to assist Somalia.

To address the ongoing water issues provoked and prolonged by drought in Somalia, all available water sources must be taken into consideration. Somalia has 3,025 kilometers, or 1879.648 miles, of coastline and 200 nautical miles of territorial sea (CIA, 2020). This abundance provides a wide window of opportunities for the Somali people. GivePower is a nonprofit organization that implements solar technologies to help struggling communities. "Most recently, GivePower constructed a solar-powered desalination system that is delivering clean, healthy water to villagers in rural Kenya" (Barnard, 2018). This system, which cost around \$500,000 and was installed as well as paid for entirely by the GivePower organization, provides enough clean water for 35,000 people daily.

Research by Tom Parise, a mechanical engineer and Stanford University alumni, (2012) explains that there are three methods used to desalinate water, however GivePower does not disclose which technique is used in their system. The three main methods of desalination are thermal, electrical, and pressure. Thermal distillation, which is the oldest technique, involves boiling the salt water. The steam created in this process is collected; most importantly, the salt is left behind when all the water evaporates. The second desalination technique is electrical. "Typically, electric current will be used to drive ions across a selectively permeable membrane,

carrying the dissociated salt ions with it" (Parise, 2012). Lastly, pressure desalination, or reverse osmosis, is a method in which pressure forces salt water through a permeable membrane. The salt is left behind as the water is filtered. Although the last two are quite similar in how they filter water compared to the first method in which a filter or permeable membrane is not necessarily used, all three accomplish the same task. Furthermore, minerals that improve the drinking water could be added once the salt is removed, possibly supplementing nutrients that may be lacking in citizens' diets.

The GivePower water farm uses solar power to remove salt from water and purify it. This possibility of abundant drinking water would drastically alter people's mindset as their priorities would be refocused on education and working. Women and children would have clean water and more time to learn and attend job training to help financially support their families and boost the economy. With more individuals contributing to the economy, Somalia could develop industries and conduct more international trade. This profit could potentially be put back into the country by improving infrastructure and expanding road systems to transport clean water to inland communities, improving Somalia's status as a whole.

Additionally, Somali communities could dig protected wells for each community. A variety of organizations, such as the Zakat Foundation of America, gather donations to dig wells in Somalia as well as other countries in need of water solutions. Zakat is a term used to describe an annual payment; Islamic individuals are obliged to give at least 2.5% of their total savings or wealth (National Zakat Foundation, n.d.). This donation is used for charitable or religious purposes. Zakat is one of the Five Pillars of Islam and helps give back and sustain Islam. The Zakat Foundation of America is an outlet that provides a place for Muslims to donate their Zakat as all of the proceeds go towards helping people in need, however anyone can donate to the cause.

According to the editors of the Zakat Foundation of America (n.d.), "...the cost of building one well in the region is just \$2,500". Although Zakat is intended to aid Muslims in need, the wells built by the Zakat Foundation of America will help all the local communities surrounding the water source, regardless of religion. Many of the wells built by the Zakat Foundation of America can be dedicated to loved ones as memorials. "...we have dug and installed more than a thousand wells and hand pumps for the loving departed of families, for the people in villages and rural communities across the world who had little or no fresh running water" (Zakat Foundation of America, n.d.). These projects would not only provide water for inland communities, but work too. With the aforementioned decrease in pastoralists due to the devastating drought, families are in need of income and water. By offering jobs to individuals, families could prosper and rebuild the now dwindling herds or find other jobs and sources of income as opportunities arise. Furthermore, the Zakat Foundation of America teaches communities about proper water sanitation techniques and ways to improve the cleanliness of their water. Many people are unaware of the importance of pure, safe water and how a variety of factors, such as storage, impact its cleanliness. Without a desperate plight for water, families can refocus on other prosperous activities that could benefit Somalia's economy and reduce

food insecurity.

In some communities, inadequate water is readily available, however education about purification methods and filtration technologies are often inaccessible. A simple, inexpensive and easy to use device is needed, such as the Drinkable Book. The Drinkable Book combines education and water purification; it costs simply pennies to produce. "Each page is a literal water filter inscribed with hygiene and sanitation education... Each book can provide a user with clean water for up to four years" (WATERisLIFE, n.d.). This book comes with a custom box in which a book filter page is placed. Unclean water is then poured into the top of the box and flows into the bottom purified and ready for consumption. One obstacle to this device is Somalia's low literacy rate of only 37.8%, which renders the hygiene and sanitation suggestions useless (Borgen Project, 2018). However, once water sources are improved and made widely available, education will follow. As water is made more available, the walk for water will drastically decrease and give children time to attend school. Learning to read is exciting for young children. Motivated by their new ability, the children would be looking for new and more challenging things to read, eventually leading them to the hygiene and sanitation advice on the Drinkable Book pages. In the meantime, the Drinkable Book can still be used as a simple and easy filter for contaminated water. This cheap technology could revolutionize how Somali families obtain and store water, greatly decreasing disease outbreaks.

Water issues aggravated by ongoing droughts in Somalia increase food insecurity in the nation. A paucity of water is a difficult burden to bear for any country, especially for underdeveloped or even developing nations. Food security cannot and will not be successfully reached in Somalia until the water crisis is addressed. Frequently, water sources inadequately provide for the livestock and crops that support the agrarian economy and food supply. This lack of water sources greatly impacts the daily lives of the Somali people, keeping them from education, job training, socializing, or even just family and free time, as well as a variety of opportunities that many people in developed countries take for granted. To combat the ever changing climate in correlation with the lack of water, organizations such as GivePower, WATERisLIFE, the Zakat Foundation of America, and many others can provide Somalia with inexpensive, reliable solutions that can improve the economy and people's lives. This economic boost can help Somalia shift from the most underdeveloped country in the world to a flourishing and stable nation.

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