

The Realities of Water and Sanitation in Mozambique

Mozambique is a South African country with many food security issues, especially in water and sanitation. It is biologically and culturally diverse and has a tropical climate with a long coastline on the Indian Ocean. It has many popular beaches, like Tofo, and exciting offshore marine parks (Penvenne, 2020). The current population of Mozambique is about 32.2 million and the official language is Portuguese, but only about half the population speaks it (Language, 2020). Other most spoken primary languages include Makhuwa, Changana, Nyanja, Ndau, Sena, Chwabo, and Tswa (Language, 2020). Mozambique has many natural resources like coal, limestone, natural gas, and cement. Northern and central areas of Mozambique contain fertile soil that have yielded a varied and abundant agriculture. Agriculture is very important to Mozambique's food security, livelihood, and economic growth as about 80 percent of the population is engaged in farming which accounts for roughly 25% of the country's Gross Domestic Product (GDP) (Agriculture and Food Security, 2021). If Mozambique starts producing to its maximum potential, it could become a world supplier of food products. However, in order to produce at maximum potential, important changes must be made. These changes focus specifically on water and sanitation and work to improve the quality of life in these aspects.

Typical family life in Mozambique revolves much around the people and the farms. With an average household size of 4.5, the family dynamic in the north is mainly matriarchal where women are seen as the head of the family who make the major family decisions. Children are generally seen to be belonging to the mother and her side of the family. In contrast, in southern and middle Mozambique, the family dynamic is patriarchal where men make the major decisions and are seen as the head of the family. There, children are seen to be belonging to the father and his side of the family. When the father passes away, the oldest son assumes the role of head and takes the responsibility of the family. Children are greatly valued in Mozambican society and families. Parents often refer to their children as their fortunes. Children are expected to care for their younger siblings and are given household responsibilities. The elderly are perceived to be very wise and all knowing (Mozambique, 2020). The family oriented lifestyle of Mozambique emphasizes the need for better water and sanitation because the practices of the families will be passed down for generations, meaning change must take place as soon as possible.

Staple foods in Mozambique include rice and xima (a paste made from sun-dried cereals, oftentimes cornmeal). Beef and fish are common foods in the north and bushmeat is common in rural areas. Tropical fruits are eaten as snacks and desserts. Additionally, vegetables like cacana mboa (pumpkin leaves), nhangana (leaves of nhemba beans), and cassava leaves are abundant (Mozambique, 2020). Other crops grown include sorghum, millet, rice, beans, groundnut, sweet potatoes and a wide variety of vegetables. Maize is common in 79 percent of rural households and occupies about 35 percent of the total planted area. Cassava is the main staple crop in the north and the south-east. It is important for smallholders as it is drought tolerant and resistant to disease. Groundnut grows in sandy soils and because of the huge shoreline, it is a very important contribution to household diet and income. These staple foods and crops are the main source of income for families as well as their own food and proper access to clean water and improved sanitation are necessary for the growth of families all over Mozambique. The major

cash crops are cotton, sesame, sugar, and tea. Coconut and cashew trees are often grown by small farmers and are important in foreign exchange earnings and household food security. In terms of household consumption, the most important livestock are chickens. Goats, ducks, pigs and sheep are also produced. In southern parts, beef to a certain extent is raised as livestock.

Education in Mozambique is low. Nearly two-thirds of children who finish primary school drop out without basic reading, writing, and math skills. Ninety-four percent of girls enroll in primary school but more than half drop out before the fifth grade. Eleven percent continue to secondary school and only one percent move to college (Education, 2021). Public healthcare in Mozambique is basic and limited. In a country which is profoundly impacted by sicknesses like malaria, cholera, and diarrhea, legitimate infrastructures need to be in place to protect the people. In rural areas where adults with children are forced to walk more than an hour away just to get help from a hospital or healthcare center, the situation is even worse. Additionally, about thirty percent of the population is not able to access health care services at all and only fifty percent has an “acceptable” level of health care, not even to mention how severely understaffed the centers are as well with only about three doctors per one hundred thousand people (Guide, n.d.). Family life is a major component in the culture of Mozambique. Lack of good hygiene due to poor access to water and sanitation is a major issue in Mozambique. Although there are some improved sanitation facilities, 76 percent of the population does not have or is not able to use them due to distance and availability (Water, n.d.). Because of this, it has one of the highest open defecation rates of 36 percent of the population (Water, n.d.).

Water itself is a very important substance for not only agricultural uses, but also for the human body. Clean water is essential in transporting nutrients and waste products, regulating body chemistry, and maintaining body temperature. The water crisis is a major health crisis with over 1 million people dying each year from water and sanitation related diseases (The Water Crisis, n.d.). These diseases include cholera, diarrhoea, dysentery, hepatitis A, typhoid, and polio (Drinking-water, 2019). Improved sanitation combined with clean water access has economic benefits as well. These include lower health system costs, fewer days lost at work or at school through illness or through caring for an ill relative, and time not spent queuing at shared sanitation facilities or walking for open defecation (Mara, 2010).

The potential that Mozambique has to be a world supplier of food produce is far from the reality. The typical family farm does not have access to modern agricultural technologies. This puts them at a huge disadvantage as it prevents them from cultivating their land most effectively and efficiently. Additionally, only about 16 percent of the suitable land for farming in Mozambique is being cultivated (Agriculture and Food Security, 2021). Weather variability is an extremely important factor in crop performance in typical farms as a majority of the agricultural production in Mozambique is rain-fed, but modern irrigation facilities and technologies are only available to a small number of commercial farms. This leaves a huge potential for improvement as average crop yields are half of the regional standard estimates. Additionally, only a fourth of the urban population in Mozambique has access to piped water (Mozambique - Water and Sanitation, n.d.). As the population increases, especially in cities and towns, the need for better water and sanitation services grows. The capital of Mozambique, Maputo, is an example of how poor the sanitation conditions are with the sewer system only covering a small part of the city. There is no organised system that deals with toilet waste, thus making water contamination a major risk. Lack of good sanitation directly affects health, dignity, and economic growth especially in the poorer communities (Mozambique - Water and Sanitation, n.d.).

With the economy steadily growing, the population of Mozambique is increasing as well. However, water and sanitation have not been able to keep up with the rapid population increase. UNICEF reports that only 49 percent of the population has access to clean water (Water, n.d.). Urban areas, the richest segments, have better access than rural areas with city inhabitants. Although Mozambique's WASH (Water Sanitation and Hygiene, n.d.) sector has been working to improve water and sanitation over the past twenty years, the service access levels still remain far below the universal ideal levels. For example, one method WASH used was by providing technical support Community-Led Total Sanitation (CLTS). This method is an empowering methodology that encourages communities to completely eliminate open defecation (Water, n.d.). The program conducted a teaching exercise where they talked about what open defecation is and why it is an issue by explaining how flies that land on feces around homes can contaminate the food. They also explained how even just one home practicing open defecation can put the entire community's health at risk. They taught about good hygiene and simple home improvements. Like a rack made of twigs outside of the toilet enclosure, a recycled plastic tub to use as a sink, and a bamboo rack to dry cooking utensils. Although the past twenty years have shown progression, the economy is still increasing so the population is still growing and rapid change must continue to happen.

One simple way to improve food security is to increase the yields of produce. As mentioned earlier, modern irrigation facilities and technologies are only available to a small number of commercial farms. Therefore, by increasing the modern technology for all farms, yields of produce would increase, and food security would increase. Funding for these technologies could come from global fundraisers. The power of GoFundMe accounts are immense and if enough momentum is gained, a substantial amount of money could be gathered. Additionally, donations to programs like Feed the Future (The U.S. Government's Global Hunger and Food Scarcity Initiative) that work directly to help thousands of vulnerable households around the world to improve their food security by adopting more productive agriculture technologies, improving nutrition and health, and connecting farmers to markets would greatly help Mozambique in improving food security. However, since GoFundMe accounts require internet access which cannot be guaranteed in much of Mozambique and Feed the Future requires outside help, basic filtration techniques may be more beneficial on a daily basis. For example, a combination of clay, sawdust and a plastic bucket can make a water filter that catches dirt and disease-causing microbes. Slow sand filtration is another technique for water filtration that has shown a 99.98 percent protozoan, 90-99 percent bacterial, and variable viral reduction (Slow Sand Filtration, 2012). This process can even work for an entire community's water source and not just individual households. Even leaving water in a plastic bottle out in the sunlight can treat it to some extent as the UV radiation and heat kills the microbes that can cause waterborne illnesses (Goodier, 2012). Another way to expand food production would be through holistic application of mathematics and science. A holistic approach would demand that science would draw on local knowledge systems and cultural values. Mozambique would be addressed based on the issues that are specific to that country rather than the issues of multiple struggling countries. Holistic approaches would also take the water and sanitation issues into account. They would focus on the long-term effects of an increasing economy like the water and sanitation issues rather than simply the short-term economic increase.

Overall, Mozambique must improve their water and sanitation levels for the health and safety of their people. Efforts have been made and are continuing to be made to help reach it to the universal minimum, but more action must be taken as fast as possible. One of the major barriers that typical families encounter is a lack of modern agricultural technologies and water and sanitation systems.

Mozambique's main industry is agriculture, yet most people are deprived of the technologies needed to supply for their families. There are many small steps to help the water and sanitation issues, for example, even using simple water filtration systems can make an impact on crop life and human life. Another more complex solution could be to use foreign aid from the U.S. and around the world to help supply funding for agricultural technologies to help the country as a whole. Mozambique is a beautiful country and with time and support, it can transform into a healthier one as well.

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