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WaSH Practices in Mozambique

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Although there has been improvement over the years, Mozambique severely lacks basic access to WaSH facilities. WaSH is a collective term for Water, Sanitation and Hygiene - which refers to access to clean water, improved sanitation facilities, and basic hygiene materials like soap for handwashing. WaSH is an issue in Mozambique due to a declining number of natural water sources, a high amount of contaminated water resources, a lack of proper toileting facilities, and issues with governmental corruption hindering individuals from having access to clean water resources. These hindrances result in water-borne diseases, unsafe drinking water, bacteria ridden agriculture, and many other challenges for Mozambicans. One of the resolutions to be considered would be to follow the Uganda National Water & Sewerage Company's model, which has been able to increase monthly water production as well as reduce sewage overflows.
• In Mozambique, 14.8 million people out of 31.26 million do not have access to clean water. Meanwhile, only one in five individuals use safe sanitation facilities.

• In 2020, 60% of the Mozambique population was using either surface or groundwater as their normal drinking water, yet both of these sources of water are unreliable and appear to be diminishing within the country.

• Severe storms and flooding can damage drinking wells and lead to well contamination from livestock waste, human sewage, chemicals, and other impurities. In 2015, 45% of surveyed Mozambicans said that weather events like floods had disrupted their water source in the last decade.

• Nearly 90% of all diarrheal disease can be attributed to WaSH. In low- and middle-income countries like Mozambique, diarrhea is one of the largest causes of morbidity and mortality in children under five years of age.

**Key Terms**

**Decentralized system**—A system for supplying WaSH services where the "roles and responsibilities" of the service are taken "from the central government institutions" and given instead "to basin-level (local) institutions."¹

**Maputo**—The capital city of Mozambique. The city is located on the southeast coast of the country and is the most populous city of Mozambique.²

**Safe Sanitation**—Safe sanitation facilities hygienically separate excreta from human contact through one of three ways: treating and disposing of excreta on site; storing it temporarily and then emptying and treating off-site; or transporting it through a sewer with wastewater and then treating it off-site. If the excreta from sanitation facilities are not safely managed, then people using those facilities are classed as having an unsafe sanitation service.³

**WaSH**—WaSH is a collective term for Water, Sanitation and Hygiene. The term relates to access to safe, clean water, improved sanitation facilities and basic level of hygiene maintained.

**Context**

**Q: What is WaSH?**

WaSH is a collective term for Water, Sanitation and Hygiene - which refers to access to clean water, improved sanitation facilities, and basic hygiene materials like soap for handwashing. These issues are all highly interconnected, so researchers have combined them together within the
WHO is most affected by WaSH?

Globally, an estimated 785 million people do not have basic access to a reliable source of water, and an estimated 4.2 billion people do not have access to safely managed sanitation. An estimated 3 billion people are lacking access to basic handwashing facilities. While all people are affected by WaSH due to the basic human need for water and for eliminating waste, those who live in rural communities are affected more from poor WaSH conditions than those in urban areas. This disparity exists because individuals in rural areas are typically at a greater distance from resources and typically have lower incomes. For instance, 64% of individuals in rural areas go without access to safe and approved water sources, while estimates are only 17% in urban areas. Rural areas also have a higher rate of open defecation than urban areas with a rate of 88% compared to 53%. Open defecation refers to the practice of defecating in fields, forests, bushes, bodies of water, or other open spaces and is considered an unsanitary practice. Maintaining hygiene in rural areas can also be a challenge in homes, schools, and health centers that have dirt floors, that do not have water available for handwashing, and that share spaces with domestic animals. Low income countries with large rural populations struggle the most with poor WaSH practices. Mozambique is one of those countries whose population lies mostly among the rural population.

What do WaSH conditions look like in Mozambique?
In Mozambique, individuals find it hard to access safe sanitation and clean water. For instance, 14.8 million people out of 31.26 million in Mozambique do not have access to clean water. Meanwhile, only one in five individuals use safe sanitation facilities. Mozambique has one of the highest open defecation rates in sub-Saharan Africa, which is 27%-36%. In regions of the capital city Maputo, approximately 87.1% of the population does have access to safe water and 70.1% have access to safe sanitation. In comparison, Zambezia, a predominantly rural province of Mozambique and one of the most populous provinces, only 30.6% of people have access to safe water and 13.0% have access to safe sanitation.

Q: How significant are the WaSH conditions in Mozambique compared to other countries?

Mozambique is the 10th worst country in the world for access to clean water. For reference, Eritrea, Papua New Guinea, and Uganda are the three countries with lowest access to clean water in the world. In Eritrea, only 19% of individuals have access to clean water; in Papua New Guinea only 37%; and in Uganda only 38%. In Mozambique, 47% of individuals have access to clean water. In sub-Saharan Africa, 75% of the population (767 million people) lack basic hand washing facilities, and Mozambique is one of the less developed Sub-Saharan African countries in regard to hand sanitation.

Q: In Mozambique, who is in charge of providing WaSH facilities and amenities?

Mozambique uses a decentralized water management system. This term means the different regions of the country get their water from different sources. No single organization is in charge of water distribution, but the national government assigns the various water supply responsibilities to local government and regional organizations. It is also the same for sanitation facilities. One example of an organization
regionally responsible for distributing water to Mozambique residents is ARA-Zambeze, which has jurisdiction over the Zambezi River. Another is FIPAG, which is the organization that the national government has entrusted with the responsibility of water supply to 14 major cities, including the capital.

Though this is the case in most urban areas, people who live in rural areas are often responsible themselves for their communities’ water and sanitation facilities. It is unclear exactly what percentage of the Mozambique population has access to serviced water.

Q: How have WaSH practices in Mozambique improved or worsened over the years?

With support from both local government and non-government organizations, Mozambique has acknowledged the need for WaSH reform and has made noteworthy improvements in both rural and urban areas in the last several decades. For example, before the 1990s, water distribution throughout the nation was unorganized because the organizations overseeing water supply were inefficient (and in some cases, non-existent). In the late 90s, the government created the Water Asset Holder Government Agency to oversee the professional distribution of water via legitimate service providers. Adopted in 2007, Mozambique’s revised Constitution also provides opportunities for better planning, investment, and management of water and sanitation services by allowing these services to be delegated to various regional organizations instead of one national organization. In 2008, the Water and Sanitation Infrastructure Administration was established to expand water supply management and drainage systems to over 100 small cities and towns. Despite all these improvements, the government of Mozambique still acknowledges the need for further development of WaSH services. They have goals and plans to end open defecation and further improve access to sustainable WaSH services in the next decade and a half. However, they do not appear to be on track for meeting their goals.

Contributing Factors

Limited Clean Water Sources

Natural Water Sources
The minimal and declining number of natural water sources in Mozambique makes it increasingly more difficult to provide clean water to the country's residents. A large number of Mozambique's rural population relies on the country's natural water sources for daily tasks such as hygiene, waste disposal, and farming. Natural water sources include surface water from rivers and lakes, and groundwater from wells and pumps. In 2020, 60% of the Mozambique population was using either surface or groundwater as their normal drinking water, yet both of these sources of water are unreliable and appear to be diminishing within the country. Surface water is regionally unavailable and the course of the rivers is seasonal, meaning river water is not always reliable and not evenly available throughout Mozambique. This challenge is especially true considering that 54% of Mozambique's freshwater resources originate in upstream countries, and surface water diminishes downstream. Regarding groundwater, which is water absorbed into the ground when it rains, Mozambique's recent lack of rainfall and prolonged periods of drought have made this natural water source less reliable as well. Since 1960, mean rainfall in Mozambique has decreased by an average of 2.5 mm per decade. As precipitation decreases, net water supplies decrease, contributing to water scarcity in the country. Lack of rainfall diminishes both surface and groundwater sources, although the amount these sources have diminished has not been measured. The drought which Mozambique faces can be attributed to climate variability, atmospheric interaction, and general weather circulation patterns. Rural populations have seen the biggest difficulty in the water crisis, which for Mozambique is 73% of the population. Without reliable water sources, it is very difficult for the nation to ensure the water aspect of WaSH for its residents.
The contamination of water is also significantly preventing Mozambicans from preserving the clean water that is available to them. Of particular concern is the contamination of groundwater because most households in Mozambique claim to use groundwater from wells (46.8%) or pumps (14.1%) as their main supply of water.\textsuperscript{41} Severe storms and flooding can damage drinking wells and lead to well contamination from livestock waste, human sewage, chemicals, and other impurities.\textsuperscript{42} In addition, 45% of Mozambicans surveyed in 2015 said that weather events like floods had disrupted their water source in the last decade.\textsuperscript{43} Other research corroborates this idea and shows that there is a lot of well contamination during Mozambique's rainy season due to well damage.\textsuperscript{44} Well damage allows contaminants including bacteria, fertilizers, or nitrates from the ground to enter the water source when flushed in by flooding water.\textsuperscript{45}

Another source of contamination is poor agricultural practices. Agricultural practices such as continuous cultivation without adding any supplements, overgrazing, poor land management practices, lack of soil and water conservation structures, and high incidence of indiscriminate bushfires can all lead to contamination of surface and groundwater.\textsuperscript{46}

Similarly, water collected for drinking and household use can also be contaminated in the collection or storage process, which inhibits public sanitation and transmits diseases. The main pollutant in unsafe water sources is fecal matter. In one study, water samples in Mozambique were tested for microbiological contamination and 29.6% had intermediate or high-risk water quality.\textsuperscript{47} Poor storage practices are common in Mozambique due to an overburdened water system, weak and corrupt local governments that mismanage resources, poor long-term investment, and a lack of environmental research and urban infrastructure.\textsuperscript{48}

**Inadequate Toileting Facilities**

Inadequate toileting facilities that lack proper sewage maintenance are causing poor sanitation practices in Mozambique.\textsuperscript{49} As much as 76% of the Mozambique population does not have or does not use safe sanitation facilities.\textsuperscript{50} This figure is due, in part, to the fact that the majority of people living in cities in sub-Saharan Africa use onsite sanitation.\textsuperscript{51} Onsite sanitation is a term for sanitation facilities that are not connected to the sewage system.\textsuperscript{52} This type of sanitation can be considered safe if the facilities are properly maintained, but it's not optimal. Of the total...
Mozambique population 61% was using safe sanitation, but looking at the specifics, less than 1% were connected to sewers (which is the most common safe sewage practice in developed countries like the United States and Australia). This percentage shows how much Mozambique is lacking the sanitation infrastructure necessary to maintain optimal WaSH practices.

One type of on-site sanitation facility used in Mozambique is the pit latrine. Pit latrines consist of a hole in the ground that may or may not be lined with a reinforcing material to contain human excreta. Depending on its design, maintenance, and frequency of use, safe pit latrines can be used for 10 to 30 years, though many are unsafe and are used for fewer than 5 years before they are full and must be emptied or covered. Many toileting facilities in Mozambique also lack the proper materials for people to maintain hand hygiene after using the toilet. Fewer than 29% of the population in rural Mozambique has consistent access to water and soap for handwashing. Both the underdeveloped toilets and the unavailability of handwashing materials make the toileting facilities inadequate.

Political Barriers to Accessing Water Sources

In Mozambique, governmental corruption is identified as one of the main factors hindering individuals from having access to clean water resources. Corruption is typically seen when a local public officer puts a lock on the community water pump and requires a fee to access it. While data in Mozambique for the price on handpump water with a lock is not widely available, applicable data from neighboring countries is available and gives a reasonable idea of what the situation in Mozambique may look like. In Kenya, individuals fetching water at a locked pump typically pay up to 20 shillings per 20 liter can. This price is equivalent to 11 meticais in Mozambique (approximately $0.17 US dollars). This estimate is typically 5 times the price of water serviced in Mozambique and shows the financial barrier to accessing water that is caused by corruption. In surveys conducted in Mozambique, 34% of households reported that it was always necessary to bribe officials for water services, over 20% of individuals reported that they paid bribes in over 25% of
Apart from bribes, there are other instances where corruption prevents people from accessing water services. For example, it has been recorded that some individuals in power will pocket public funds intended for building new water sources, spending them for personal gain instead of on the needed public WaSH services. Similarly, politically connected and wealthy individuals sometimes use their positions of power to influence the location of new water sources. When wealthy individuals choose the location of a new pump, they often choose somewhere closer to themselves, making it farther and more costly for the poor to access. Corruption can also prevent necessary upgrades to the water services. In one survey of multiple African countries including Mozambique, respondents reported that public service officials were reluctant to engage in water innovation projects. The same respondents rated corruption in governance as having a negative influence on water innovation. Though the survey does not seek to explain the reasons for this negative influence, the behavior may be attributed to the fear that improved water systems would eliminate officials' opportunity to ask for bribes and receive financial gain from the water service sector.

Although there is a lack of comprehensive information on the scope and nature of the corruption in Mozambique, it is clear that the decentralized WaSH service system contributes to the issue by allowing officials to engage in corruption in remote areas of the country without significant supervision or accountability. It is estimated that corruption denies more than a billion people access to safe drinking water each year.

Consequences

Water Borne Illness

Poor WaSH practices in Mozambique, specifically the lack of sanitation facilities and poor hygiene practices, cause waterborne diseases, such as diarrhea, cholera, typhoid, and parasitic infections. Rotavirus and cholera are particularly endemic in Mozambique. People in Mozambique contract these illnesses when they are in direct contact with
contaminated water through ingestion, such as drinking and cooking, as well as through contact with contaminated surfaces in the bathroom. These illnesses can result in stomach pain, vomiting, diarrhea, headache, fever, and kidney failure. 69

Diarrhea is the most common of all waterborne diseases. 70 Nearly 90% of all diarrheal disease can be attributed to WaSH. In low- and middle-income countries like Mozambique, diarrhea is one of the largest causes of morbidity and mortality in children under five years of age. 71 829,000 people die every year from diarrhea caused by poor WaSH practices, with about 297,000 of those deaths being children younger than five years old. 72 In Mozambique, diarrhea is estimated to be responsible for approximately 20% of hospital admissions and is the fourth cause of mortality following malaria, HIV, and pneumonia. 73

Women's Hygiene

Due to menstruation and the amount of contact women have with the bathroom when they relieve themselves, women's health is more likely to be affected by poor WaSH practices than men's. Seeing that schools surveyed in Mozambique had sanitation facilities unequipped for menstrual hygiene management (i.e. schools were lacking same-sex facilities with features like lockable doors, water and soap, and bins for pad/tampon disposal 74), it can be assumed that menstrual hygiene management is greatly affected by poor WaSH. Only 5% of sanitation facilities in Mozambique schools have waste disposal bins. 75

This lack of access to disposable bins encourages poor menstrual hygiene practices, such as using sanitary napkins for an unsafe amount of time, which can pose risks to women's health, such as increased risk of urogenital infections. 76 Similarly, only 4% of surveyed bathrooms in several cities throughout Mozambique had doors. 77 In a study on Maputo, one woman reported, "You cannot imagine the gymnastics I do when I have my period. I do not feel relaxed because I do not know if I'm being watched." 78 Women are also exposed to more health risks when they have limited access to adequate toileting facilities, such as painful and costly urinary tract infections. 79
Apart from causing difficulties with menstrual hygiene, poor WaSH practices also cause women in Mozambique to be at greater risk of contracting Female Genital Schistosomiasis (FGS). Female Genital Schistosomiasis (FGS) is a disease caused by a waterborne parasite that affects both the urinary and genital tract of infected individuals. This parasite can be contracted when skin comes in contact with infected water (like swimming holes) or through drinking infected water. FGS can cause tumors, ulcers, and infertility. It has been described as one of the most neglected sexual and reproductive health diseases in sub-Saharan Africa, affecting an estimated 56 million women and girls. FGS causes open sores, inflammation and exposure to blood, giving easy access for any virus to enter the body. As a result women and girls with FGS are up to three times more likely to acquire HIV. Poor WASH practices in Mozambique leave much of the drinking and recreational water in the country contaminated, thereby increasing the likelihood of exposure to the waterborne pathogen that causes FGS.

### Agricultural Issues due to Poor Sanitation

Poor sanitation affects the quality of agriculture in Mozambique; one reason for this reality is fecal infiltration of the soil.

There is a reported occurrence of high levels of two types of bacteria, fecal coliforms and escherichia coli, traced back to lettuce sold in Maputo markets, which comes from the contaminated land they are grown in, the Infulen valley. The Infulen valley is one of the two largest agricultural areas around the city of Maputo. This valley has been contaminated with urban sewage from the valley's wastewater treatment plant, and these waters have not been treated as recommended, which has led to the accumulation of microbiological and chemical pollutants in crops and water resources, and ultimately to severe health impacts among exposed food consumers and farm workers.

Another issue is the contamination of agriculturally used water. In local markets in Maputo, 46.7% of the vendors do not wash the vegetables before selling them. Of those who wash their products before selling, only 7.5% use treated tap water, while the other 92.5% wash them in plastic containers using untreated water. Use of untreated water most likely has a negative effect on the sanitation of the vegetables. This claim is corroborated by a separate study which concluded that produce washed with well water had more fecal coliforms than the produce washed with tap water.
Agriculture and health are linked in many ways, and agriculture can be linked with poor WaSH practices and its negative impact on the health of individuals in Mozambique.90

Best Practices

Remodel WaSH Infrastructure in Mozambique

Mozambique can improve its WaSH infrastructure and practices by patterning its system after that of Uganda, country whose WaSH system has successfully been remodeled in recent years. Uganda's national utility company responsible for urban water delivery, the National Water & Sewerage Company (NWSC), engaged in a substantial turn-around of its sewerage and water practices in 2010. As a result, the NWSC stands as a widely acknowledged model for how sub-Saharan African countries, such as Mozambique, can better their WaSH practices.91 In the early 2000s, the NWSC was operating at a loss, with performance indicators below African utility standards.92 In 2010, Dr. William Muhairwe, the newly hired managing director, turned everything around when he set up various committees to oversee the different aspects of the company. For example, he created separate committees to oversee water production and sewerage, water distribution, customer service, and expenses.93 Using the feedback received from each committee, the NWSC set goals to improve each sector and gave themselves a 100-day deadline. The goal was to sustainably and equitably provide cost effective quality water and sewerage services while conserving the environment.94 To ensure that each team remained on track, the chair monitored progress through a series of scheduled meetings and updates. At the end of the 100-day program, all participants gathered for a final review to assess performance.95

Under Dr. Muhairwe's leadership, monthly water production increased from an average of 38MM to 66.6MM liters. Sewerage overflows were reduced and response time to blockages declined.96 Water meter coverage increased 12% and unaccounted-for water fell from 49% of total water produced to 33%.97 NWSC was able to make 12,000 new water connections, of which 3,000 service the poor. Setting and achieving performance improvement goals is an ongoing feature of managing the water utility in Uganda.98 NWSC's system is now hailed as a model by other African nations, corporations and municipalities. In order for this system to be successful in Mozambique, the government would need to implement a national utility company like Uganda instead of relying on regional organizations.99
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Karsyn is a sociology major with a double minor in international development and Portuguese. Her passion for people and cultural studies stems from her experiences living in diverse places such as England, Brazil, the southern United States, the Midwest, the Northwest, and now the Rocky Mountains. While Karsyn was living in Brazil, she found her passion for empowering those around her, thus her love for international development was born. Ultimately, she plans to work in Non-Profit management but is open to other roads ahead. She hopes to use her knowledge and skills to help find better and more sustainable practices for social impact organizations in the future.