

Amelia De La Torre  
Chaminade Madonna College Preparatory  
Hollywood, FL, USA  
Zambia, Water Scarcity

### **The Effects and Potential Solutions to Water Scarcity in Zambia**

There is no doubt that throughout the thousands of years of human existence the issue of insecurity has been a prevalent and continuous occurrence, whether it be in regards to a lack of food, water, shelter, or sanitation, among numerous other necessities. Even in the modern globalized world, where development, economic prosperity, and innovation are at their greatest in certain countries, many other regions face creeping numbers of impoverished people and uncertainty. The latter attributes are commonly seen in less-developed countries such as Zambia, where, despite rising industrialization, it still has a large majority of their population in areas with little to no access to basic necessities. The issue of water scarcity is becoming especially relevant in such countries as global temperatures reach all time highs, thus depleting some of the most precious water sources for these third-world nations. Zambia is heavily affected by this, as most of their water comes from sources affected by the rising temperatures. Effective strategies must be implemented to ensure the availability and reliability of water sources and the continuation of Zambia and its people.

Zambia is the 65th largest country in the world population-wise and features a representative democracy, though the leading president ultimately holds much greater power than the judicial and legislative branches, as he can dissolve the National Assembly, call for elections, including his own, and holds control over the national army. The region is also the 38th largest country land-wise, though only a small 15% of it is used for agricultural purposes. Most farmers are small-scale producers who grow crops to feed the nation's people while the country's popular exports and crops of maize, sugar, rice, and cotton are made by its minority medium and large-scale farmers, some whose farms stretch the lengths of several football fields. According to the World Bank, as of 2020, over 55% of Zambia's population live in rural areas, and it is here that water scarcity takes its most dramatic effect, especially for the families there. A typical Zambian family consists of at least six children, as they can act as caretakers to their parents and helpers on the frequent family farms. Each member will likely have to live with under two dollars a day per person to support the family, a result of the low income that comes from family farms. As a further way to help each other, according to Volunteer Work Africa, members will take traditional roles and "where there are rivers, men will go fishing in their dug-out canoes, children [will] herd cattle and women [will] pound home grown maize (with their children wrapped in chitenge on their backs) to make Nshima, a traditional Zambian dish" ("Life in Zambia"). In addition, the children also have to balance their highly valued education and studies along with their work for at least six years, before the free tuition ends. The unfortunate reality, though, is that along with these already tiring conditions, millions of Zambians have to worry also about the frequent water supply issues.

Water supports nearly every practice and activity in Zambia. In both rural and urban environments, water is used to prepare nearly every meal, including the aforementioned Nshima. In addition, the very products needed to make a complete meal take up gallons upon gallons of water, simply to feed one cow or grow a small plot of maize. Clean water is also the predominant form that Zambians use to clean themselves and thus lower the risk of diseases that come from poor hygiene and contaminated water. However, as told by Globalwaters, "an estimated 4.8 million Zambians lack regular access to clean water, and 6.6 million lack access to adequate sanitation facilities" ("Zambia"). This, as a result, leads to a large percentage of the country either malnourished or in danger of deadly diseases. This evidently can be seen in higher

mortality rates especially among young people and infants, the latter which has a 7% mortality rate. Women, also, are especially prone to dangers because of water scarcity, as they typically are the members of the family who go out to get water. As distances stretch to greater lengths, so do the risks that may be faced, whether it be from enemy villages or environmental dangers. It is also often true that native majority populations are given more immediate concern for such issues, leading to typically overlooked groups to be even more negatively affected by such circumstances. As a whole, while certain efforts have led to the previous threats and occurrences of water scarcity to decline by a small amount, a growing population in the country and global warming continue to threaten the sustainability and efficiency of how water in Zambia is distributed.

One of the best solutions to this issue has already begun to be implemented by the Zambian government: the protection and restoration of wetlands in the country. These ecosystems are not only important in providing immediate water but also in preserving rainfall from floods which can later be used when frequent droughts occur. As of April of 2021, the Global Environmental Facility had provided six million dollars to the Zambian government, who have used the funding to restore parts of the wetlands and plant vegetation and crops that are drought and climate resistant to ensure the sustainability of the treated areas. There is room for improvement, however, and the reason that this method is still chosen as a potential solution is because as of right now, the project remains small. “The initiative is focusing on [only] the Lukanga and Bangweulu wetlands in the Central and Luapula parts of the country (respectively)”, says the Global Adaptation Network, and while such areas are widely successful in their rebuilding, other wetlands, even though substantially smaller, would greatly benefit from further restoration. As of right now, the plan stands only as a four-year project, but with an extended time period and budget, the benefits could be widespread across Zambia, not just in the certain regions affected by the Lukanga and Bangweulu wetlands. Since the Global Environment Facility already offers funding and the project is supported by the United Nations Environmental Programme, either could help with this national cause, which would then be further distributed by the Zambian government, as it already is currently. If problems were to arise regarding difficulty distributing this proposal across the country (as the nation is relatively large), local agencies could assist if they receive funding from Zambia’s government. The project would also not need to occur forever as once the efforts are completed and certain vegetation is planted, the affected areas would become sustainable for years. With an eagerness from the Zambian people added to this recipe for positive change, the idea seems destined for success.

Additional solutions could also reside in foreign nations who are facing water issues similar to those in Zambia. In particular, the South African city of Capetown found itself facing a “Day Zero” in 2018, a haunting thought of a date when the present water crisis would result in water no longer being available for the town. However, several calls for action came about and the city was able to avert Day Zero. This was a result of several aggressive campaigns, with one of the most prominent being the severe decrease in the use of water for nonessential purposes, such as in pools. While implementing this likely will have little effect on rural Zambian populations, as water is already only used for necessities, if used, this could be at least part of the solution in Zambian cities, where water is often used more sparingly but with dramatic consequences. South Africa has brought about solutions to combat the very issue of water scarcity in rural villages, especially as many fear the possibility of their own Day Zero. The first method used was first brought about in KwaZulu-Natal: a drip irrigation system. This mechanism involves the use of hoses that are brought to where crops are being grown and in periodic intervals, the hoses slowly drop river water to the crops. This method of direct water distribution near the roots of crops lessens the risk of water evaporation, cutting the need for irrigation and the need for more of the precious resource. In addition, the presence of several small streams across Zambia could make this idea an effective solution. In South Africa, drip irrigation is funded by a non-profit food security group, Siyazisiza Trust, in one region and this could similarly occur by any one of the similar organizations in Zambia specific to the

area where the system is being implemented. In addition, if this idea were to occur on a larger scale, the Zambian Ministry of Agriculture and Co-operatives could provide assistance if they hear about the cause. As long as the rivers continue to flow, this method will prove to be sustainable and in extreme cases groundwater could be used. In addition, another South African creation, “Jojo tanks”, could be used. The tanks, as told by Kim Harrisburg of Reuters, “hold rainwater running off tin roofs to more irrigation pumps and hoses” (Harrisburg). Harrisburg also notes that in doing so, the people of rural villages, especially women are able to spend more of their time growing more food for their families as well as working and thus getting higher incomes. As a result, Zambian people could not only assist in their issue of water scarcity but also in the problems of food and financial insecurity. All of the solutions discussed in this increment could also be particularly useful for the Zambian population as a whole because they are relatively simple and could be built or practiced with little need for help from outside organizations once they are started. Thus, because of the use of these South African technologies, water scarcity issues in Zambia could be lessened for the entire country.

Another solution that can potentially be used is the implementation of performance-based contracting to lessen non-revenue water. Non-revenue water, or NRW, is any form of leakage which prevents water from reaching consumers and it has become a prevalent issue in nearly any area where water is scarce. Often the problem is increased by water distribution companies, organizations who are paid for the amount of water they distribute on their end, not the amount of water which actually arrives to the consumers. Thus, there is frequent NRW under large water distributors because there is no need to fix any leaking pipes or equipment; they get paid regardless. This can be lessened or even solved by the distribution of performance-based contracting (PBC) to such companies. These contracts make it so that “the remuneration of the contractor is paid against achievement of outcomes rather than inputs” (Sy and Ahmed). This would make it so that in order to receive money for their services, water distribution companies would have to ensure that their equipment is well taken care of, helping to lessen any water waste from NRW and provide more water to villages and cities which need them. Currently, the World Bank as well as the International Water Association are working to advocate for the emergence and implementation of PBCs in various countries as they have already successfully done in parts of Vietnam and Kenya. In Zambia, the system could be properly conducted by the Zambian government or members of the Public-Private Infrastructure Advisory Facility, an organization devoted to helping the infrastructure of developing countries. By using such a method as PBC, the results could be incredible: not only short-term benefits for the Zambian people but also a long-term solution for reliable water.

As an additional note, the value of education about these topics should be strongly noted, especially in developing countries such as Zambia. The Canadian government states the importance of this in an article about such matters, stating that “a quality basic education gives... the knowledge and skills [needed] to face daily life challenges... It is also a key driver for reducing poverty [and achieving] social development” (“Education in Developing Countries”). Often, progress is limited not by a lack of solutions or funding, but instead by a lack of education about the presence of such possibilities. The prior solutions discussed already exist, but the reason they are still presented as relatively new ideas that can be implemented in Zambia is because they are often restricted to certain areas; knowledge of them often won’t spread to a large quantity of the population, especially the rural people. In addition, knowledge of these subjects and solutions gives people something to promote or protest for, allowing the entire population, from high officials to farmers, to initiate change. Further knowledge could also be implemented regarding whether or not solutions could be put into effect based on the geography and resources of Zambia. Thus, the increase of education about these topics can be thought of as an additional solution to water scarcity (and other issues) in Zambia. Who would act as teachers isn’t particularly important as long as they are educated on the relevant topics. What would matter is the monumental effect of their presence: a strong possibility of the improvement of the country as a whole.

The presence of potential solutions to water scarcity such as the preservation of water sources, the use of international technologies, the implementations of PBCs, and greater education for the population could greatly help to lessen the current *Zambian* water crisis. There's no question regarding the existence of such a crisis and it will only continue to worsen as Earth continues to warm, populations increase, and water sources continue to shrink if something is not done about it. The solutions proposed are only a few of many, but the real importance is that something does indeed need to occur. It is the duty of those of the present to preserve a home for those of the future and to help those who are already here. With such action change will inevitably follow, and with it, the hope for a tomorrow that is better for the globe than the days that have passed.

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