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Mali, Factor 9: Water and Sanitation

### **Water in the Veins**

Agriculture is the heart of this world. Its beating heart allows life to thrive, but the beating is only getting slower and slower. If agriculture is the beating heart, consider water to be the blood coursing through the veins of the world to continue the pumping. Since we are surrounded by vast oceans, people have become oblivious to the ever-growing issue of water scarcity. Food security and water scarcity go hand-in-hand. Without water, food production is simply impossible. There are 196 countries in this world. Even though a sustainable water source is essential to producing enough food to feed the people, water scarcity does not seem very high up on the list of priorities for many countries. About forty-three countries, with around 400 million people, suffer from water shortage. Living in the United States is a luxury many people simply do not have. Most Americans have the liberty to make their own decisions. Turning a faucet and having running water come out goes mostly unacknowledged. Since we live in America, we usually do not worry about having enough water. America does in fact suffer from a shortage of water. What we do not realize, however, is the important role water plays in agriculture all around the globe. Neglecting water infrastructure and poor management of water can contribute to the majority of America's water crisis. In spite of that, some countries' water issues are much more complex and cannot be fixed with simple infrastructure work. Mali is Africa's eighth largest country and is suffering from water scarcity. This water scarcity is caused by many different aspects and affects Mali in many ways. Solutions must be developed and enacted to help solve this problem. Mali is not the only country to face this horrible problem, nonetheless. The water scarcity in Mali and in the United States are both solvable if education is spread to those who are not aware of the severity of the matter and proper funding is given.

Water scarcity is a global concern, which means it happens even here in our own backyard. It is important to understand that water scarcity affects everyone; even here in the United States. Our country is full of pride that can sometimes hinder us from the change necessary to better the well-being of our people. We cannot help the dozens of underdeveloped countries that are struggling with water shortage until we help ourselves. The water scarcity in America is not largely due to the volatile climate; it is primarily contributed to the lack of efficient infrastructure. In 2014, the Flint Water Crisis struck. The city of Flint, Michigan was instructed to use only bottled or filtered water for cooking, bathing, and drinking after the drinking water source was changed to the Flint River. A federal state emergency was declared in 2016 after studies showed that over 100,000 residents were exposed to high levels of lead. The water in Flint is now considered acceptable, but the residents have been instructed to continue to use bottled or filtered water until the lead pipes have been replaced; a process that is not to be completed until the year 2020. Fifteen people died from the exposure. Nearly 4,000 children were exposed to the lead. This crisis opened the eyes of millions in the United States to the importance of clean water. If the Clean Water Act would have been upheld, this epidemic could have been averted. The act established basic structure of pipes and implemented pollution control. The Flint Water Crisis is not the only example of impure drinking water. Old industrial areas are becoming populated and people are moving into areas that have been abandoned for long periods of time. Many of these now urban cities are relying on water infrastructure that was built in the 1800s. Flint taught us that neglecting

our water infrastructure can lead to serious and deadly consequences. The people in New York rely on two tunnels to get their supply of water. One tunnel was built in 1917 and one in 1936! Up to 22 million people are still served by lead lines. Even after the crisis in Flint, there are still 6 million lead pipes remaining. Even though the Flint Water Crisis was extreme, it is not the only case of lead contamination in the United States. California has had severe lack of water for almost a decade. The biggest concern is a naturally occurring contaminate called arsenic. If enough arsenic-tainted water is ingested, cancer can be contracted. Another crucial problem is the Nitrate contamination, which is caused by agricultural runoff and manure. These problems exist all over the nation. Deficient data and gaps in government oversight have extensive contributions to the United States water problem.

In his Nobel Peace Prize winning lecture, Dr. Norman Borlaug stated that “food is a moral right of all who are born into this world.” In order for food to be provided for everyone on this planet, there must be enough available water; we all know food cannot be produced without water. Water scarcity is not something the average American faces. Unfortunately, in poorer countries around the world, such as Mali located in Africa, the effects of droughts take a toll on its residents. Mali is landlocked and 2/3 desert. To make matters worse, the rainfall is very irregular. Dams and irrigation could help stimulate economic independence from the Niger River, a vital key to survival in Western African countries. But due to the climate volatility, these would not be permanent solutions. Believe it or not, flooding of the Inner Niger Delta brings an increase to Mali’s economy. The floods bring rice and fish to the residents. Facing agricultural droughts, Mali resorts to tapping into groundwater; this is expensive, and due to the lack of education on sanitation, leads to water borne diseases, ultimately killing thousands. Also in Mali, because of these droughts, and the little access to sanitized water, women are required and expected to walk many miles to reach any form of healthy water. These women carry fifty-pound jugs of water- a weight even a healthy person would struggle with! Carrying this water causes detrimental health effects such as arthritic disease and miscarriages. Over 3.7 million people do not have access to sanitized water and 4,500 children die every year from diarrhea caused by drinking unsafe water.

Mali’s economy depends strongly on agriculture. Only 2% of the 1,240,000 square kilometers of land are cultivated, as expected of an arid climate. Millet (a cereal plant), rice, vegetables, and peanuts are the main crops Mali produces; they account for approximately 45% of the GDP. Sadly, prolonged droughts destroy what little food stocks Mali has. Cattle, sheep, and goats provide around 20% of the GDP despite the lack of refrigeration and bulk transport for the meat industry. Along with these important industries, most households depend on wood and charcoal for fuel, making forestry jobs significant. Mali’s agriculture, not surprisingly, suffers due to the current water crisis. What causes this water crisis and how can it be solved? Regrettably, we cannot control the climate and rainfall of Mali. Although, there are some factors we can change to better the lives of those suffering. We need to recognize that water is more than a commodity- it is a source of life. In 2010, the United Nations did take a few steps by acknowledging water as a fundamental human right; yet, the aid still falls short. Unequal access to clean water is another problem. Since the rich, upper-class has access to more water, they pay less for a gallon (law of supply and demand). Another major issue that must be addressed is African smallholders getting evicted, sometimes by force, because of large-scale speculative land purchases. African governments must prioritize the stopping of land grabs and making food and sanitized water available to everyone. As easy as this seems, they cannot do it alone. WaterAid, founded in America, has helped Mali since the year 2000. They assist communities in urban areas construct communal taps and villagers in rural areas are taught how to deepen and protect hand-dug wells against contamination. The Mali Water Project is a non-profit organization that is a collaborative

effort with villagers in Mali and students attending the University of Illinois. These organizations' efforts are valiant, but more must be done.

Residents in Mali use wells to try and overcome the ever-present water scarcity. While collecting water from wells seems like a healthy alternative to fetching water from creeks, rivers, and ponds contaminated by animal wastage, the wells and centralized taps are still at risk of pollution by improper storage and unsanitary containers. Educating residents facing water scarcity should be the first step in creating a solution. Simple purification techniques could be taught such as solar disinfection. This requires a small plastic bottle to be filled with low turbidity water and shook for oxygenation to occur. The bottle must then sit in direct sunlight for up to six hours in order for the ultraviolet rays to improve water quality. This strategy has virtually no cost; the downside is the long wait and limited supply of water provided. However, this method is easy and could give temporary relief to those in desperate need of water. Ceramic filters are another method of cleaning unsafe water. They remove bacteria through the micro-pores of the clay. These filtration options may seem limited, but they are the best hope for reducing water related deaths until piped, treated water is accessible to everyone. Reaching these communities is the essential part of the solution. Partnerships must be made with nongovernmental agencies and local organizations in Mali. Colleges in the United States should create partnerships with the struggling countries. Educational classes should be provided where an ambassador of the country could come talk to the students at the college about the extent of their water problems. Colleges should also be sending students overseas to contribute to the building and education in these third world countries. Sometimes finding willing partners is difficult and so is funding. Awareness of Mali's situation must be spread via social media in order to receive adequate funding for supplies. One useful supply is the LifeStraw. It is the world's smallest filtration system that allows users to drink out of any contaminated water source. These can be purchased for \$20 here in the United States. It is imperative these life-saving inventions are distributed throughout third world countries such as Mali. With an innovative tool like the LifeStraw, thousands of lives could be saved every year! In addition to implementing water filtration systems, education must be included to maximize the efficiency of each technology and proper sanitization of water handling. Creative solutions from entrepreneurs, if provided proper government funding or micro financing, could save millions of lives.

About 71 percent of the Earth is covered in water and the oceans hold about 97 percent of that water. Water also exists in glaciers, ice caps, water vapor, and underground aquifers. Even though the majority of our world is made up of water, billions of people are impacted by a shortage of it. Water scarcity already affects every continent and about one fifth of the world's population. Water has a huge impact on food. Food without water is just not possible. The United States, although seemingly the perfect society, still has millions of people that suffer from water scarcity. Once our own problems have been addressed and proper water infrastructure is provided to those in our country, America should use its powerful influence to become an example to other countries around the world. With our powerful influence and education, we can help provide clean drinking water to the several underdeveloped countries, such as Mali, who do not even know where to begin to provide sanitized drinking water to their dying residents. The world's population will skyrocket to 9 billion people by the year 2050. Seeing as the world is already struggling to provide for the 7.5 billion people, it is time for the fortunate people of our country to take action and help stop the water scarcity problems of those not only in Mali, but all over the world. Even in the "life abundant," we should be aware of our struggling brothers and sisters. We as progressive agriculturists should serve our own, and the world's interest, in providing water, a necessity of life, to those who need it most. If agriculture gave rise to where we are today, we

have the responsibility to carry on the legacy. Blood may be thicker than water, but in this case, water is the key to ensure the beating of the world's heart continues.

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