

Brook Hoover  
Ponchatoula High School  
Ponchatoula, LA  
Niger, Factor 2

### **Water Mobilization to Enhance Food Production: Niger**

One of the most impoverished countries in the world is Niger which is located in Africa. The population is just over 16 million people. Niamey is the capital, and is home to more than 500,000 citizens (1). Its location along the Niger River has resulted in its large, diverse population. The majority of the population is Hausa which accounts for 53 percent of the total population. There are five main ethnic groups throughout the country, all with their own language and religion. These groups consist of Hausa (53 percent); Zarma-Songhai (21 percent); Tuareg (10 percent); the Kanuri (4.4 percent); and Arabs, Tubu, and Gourmantche (1.6 percent). While there is ethnic diversity amongst the citizens of Niger they all suffer in the same way. A disastrous flood season combined with severe drought causes the people of this country constant hardship. Most of these people live in houses usually consisting of sun-dried mud brick, though some resort to tents. This then leads to the question of Lord Adair; "How is Niger going to feed a population growing from 11 million today to a projected 50 million in 2050 in a semi-arid country that may be facing adverse climate change(2)?" One of the hottest countries in the world, most of Niger's land is composed of arid desert, and a small percentage of the southern region is known to be tropical in climate with the third largest river in Africa flowing through it called the Niger River(6). However, water is scarce causing a severe famine across the majority of Niger.

In Niger, the average family consists of about 20 people. Polygamy is a legal and common practice and each man may have up to four wives. Given that most men have an average of two wives, Niger has one of the highest birth rates in the world(10). In 2009, the birth rate was 50.6 births per 1,000 people. Also, for every 1,000 children born each year, 262 of them fail to reach their fifth birthday. Since this is the case, women feel a desire to compensate for their lost children. This leads to them having an average of eight children in their lifetime. Seventy-six percent of women in Niger are married and start having children before they are eighteen years old(3). A result of this is overpopulation. In addition to overpopulation, only eleven percent of the land is arable. Currently the farms in Niger range from 1.5 hectares to 2.0 hectares. Most farms are smallholder facilities that are normally operated by the women of the family. The crops they grow over the course of a year are usually just enough to feed their families. Most of the other food produced is staple foods. Some of their staple foods include millets, cowpeas, and a drought resistant guinea corn. Since the total population is over 16 million people with only a small percentage of land usable for agricultural practices, the people of Niger must make efficient use of their land. However, every three seconds a child in Niger dies of hunger-related causes. With a poverty level of 63 percent and 70 percent of the total population living off of less than one dollar a day, this country's agricultural practices definitely need improvement and assistance.

In developing countries, it is common to have a large percentage of the population affected by HIV/AIDS. A lack of healthcare is of deep concern in this country, as it contributes to many deaths. Most of the country lacks the knowledge or is unaware of how important their health is. As a result of lack of knowledge, serious diseases strike this nation often. These diseases include diphtheria, pertussis, measles and tetanus and effect the country in the worst way while taking an abundance of lives. Break-outs of infective maladies are a result of unsanitary living. Niger only has 38 medical centers across the country including only a handful of dispensaries (198). These vendors proved to be insufficient in 2005 when they were unable to handle the food crisis or the increasing health care problems. The parents of many children are getting weak, sick, or even dying from diseases such as HIV/AIDS. This results in increased drop-out rates. When a child loses their parents, they are often forced to leave school to help care for their siblings. Now these children have to help forage for leaves and unripe berries to mash down and boil so they have

a source of food for their younger siblings. This causes education to be left off the list of priorities for many people of Niger. Within Niger, the literacy rate of the overall population is 13.6 percent. Only 29 percent of the population is enrolled in primary education while 7 percent are enrolled in secondary education(5). Of course these statistics are totally unacceptable for Niger to ever be able to improve the living conditions and quality of life for its' citizens.

The root of a poor healthcare system and education system is an unstable government system. Because of the many different ethnic groups many conflicts occur in politics. To claim their independence, Niger suffered austere military rule. Thirty-three long years later, after they finally claimed their independence from France, the citizens of Niger held their first free and open elections. In 1993, Hamani Diori became the first president of Niger. In Tuareg tribes ended a five-year peace accord. They accused their government of not bringing economic aid as they were promised. At that point, Niger created the National Reconciliation Council. The council effected a transition to civilian rule in December 1999. Today Niger is a Republic in which the President is elected and the Prime Minister is appointed. United, these two pillars ensure peace and political stability within Niger. The president serves a five year term. Niger has universal adult suffrage which means that every adult has the right to vote. Also, 83 Deputies are elected in the same way as the President. Government has a huge impact on hunger and literacy rates as well as the health care system. With the people of Niger living on less than a dollar a day, this country's government is not meeting the needs of its people. The article "Hunger Crisis in Niger: Starvation by Market" says "the market respects demand, not need(4)." Currently, the Niger government is working on a study on water mobilization to make water more readily available. The studies are happening in Maradi, while the government has already intervened in Tahous and Zinder. They are making undertaking this project with the hopes of replenishing the water table and improving food security. While I do think that this is a great start to improving this country, there is more that can be done to improve the amount of usable water(9).

After thoroughly researching the situation, the obstacle I have chosen to address is the problem of water scarcity. Over the course of a year, the average rainfall for Niger is 23 inches. The city of Gaya accumulates 850 mm of rain during the months of June, July, August, and September and experiences a drought the rest of the year. When rain permits, the region grows millet, rice, sorghum, cassava, and cow peas. Since only 0.01 percent of the land is used for permanent crop production and drought is worsening over time, a solution is needed. What if there was a way to keep the water there? Is there a way to store it and save it for agricultural purposes? And finally, is there a way to transfer water to where it's needed most?

If you could capture water when it is most abundant to make it available at the points of high need, agricultural production would increase. The result is a rippling effect on the entire country. The idea of capturing water and storing it could benefit Niger in so many different ways. I understand that this solution is not an easy one and it will not show results overnight, but over a long period of time this idea could impact this country's future. By having water for crop production you can have more land available because now you can have water in places that you wouldn't have it otherwise due to drought. Farms will then increase in size causing more job availability. The amount of crop production would be higher than ever resulting in a higher profit, bringing money back to these farmers' pockets. I think giving the people of Niger the opportunity to farm and nurture themselves would help decrease the amount of diseases. Fewer people would be starving. This could increase literacy rates because more kids could attend school, instead of foraging for their next meal. Without water, agriculture will cease to exist; in Niger that is basically what has evolved.

Livestock are the main source of income for most Nigerians. However, Nigerians are forced to sell their livestock prior to the flood season. The animals are usually in poor condition due to the drought

conditions, which results in lower prices. Often the money raised from selling livestock is not enough to feed their family, so they eat the animals themselves. This results in economic decline (8).

Over the drought millions of people starve and die; however, birth rates continue to stay high. Niger is in the biggest famine while being the poorest country in the world. A child is dying every three seconds because there is no way for the parents to supply the food. With high birth rates the country is over populated.

By building a dam on the eastern side of the Niger River the country could then control the amount of water coming into the country. The idea of this dam is to act as a spillway; meaning that it can be opened or closed at any time. Connecting to the dam would be a canal dug at an angle. This angle would be set so that as water flows out of the dam it can gain kinetic energy through the laws of gravity. As the water flows out of the dam and into the canal it begins its journey to proper use. The water would flow through the canal until it reached Tahoua. As water flows and reaches the first stop of its journey, there would be a hill-like area of land. Since water gained kinetic energy through its journey, it will easily flow onto the hill-like area and into a funnel. This funnel will act as a drain, but it will be ridged for a continuous flow. The funnel will bring the water down to a storage tank where it will be held until it is needed. While the water is in storage, it would be stimulated to keep it from stagnating. This would be done through fan-like turbines to create a current and keep water flowing. After water is stored it will then be ready for movement through the country. Pumps will be connected to storage tanks so that water can be shipped on cue. The water will be shipped in piping to the northeastern section of the country. The shipping system will be set up like a grid for water to travel where it is most needed. In addition to a water collection system, I would also install a drainage system for flood season. This drainage system would look like a series of shower drains from the view of citizens. Underground there would be a series of pipes that were arranged in a way so that water flowed freely into the water collection system. From talking with engineers about soil type and the possibility of this system, I learned that my system would have to be placed in the third layer of soil and covered in limestone. By coating the facilities in limestone everything will be more stable and less likely to shift as the ground settles. This system will provide a way for Niger to eliminate their extremes by dealing with the drought season and controlling the flood season. It will make it possible to have water in areas of land that are arid. This in turn would increase the amount of land possible for use and would cause crop production to skyrocket. The poor farms would be directly benefitted by taking part in the construction. These farmers would have access to the water and by helping build the system, could earn money to fund the new crops to build back up their farms. In turn this idea would help them increase their amount of income by the ability to grow crops again as a result of having available water.

To execute this project I would create a non-profit organization called the Agricultural Water Engineering Organization, known as the AWE. The AWE would be in charge of this water storage and movement project. This organization would be created to be a stand alone entity in charge of all aspects of the project, however. The AWE would work closely with government officials to make sure that the countries government is informed and included in all decisions that pertain to their people. Three main types of scientists would be in charge of the whole foundation, agricultural engineers, hydrologists and crop production specialists. Their main job would be to calculate how much water is needed on a yearly basis to sustain agricultural production. They would then determine how much water was collected from the floods and how much needs to be collected from the river. Given that countries throughout the world are currently fighting over the control of water, the AWE would have the job of making sure this never caused a lack of water from the other countries along the river. These countries are Guinea, Mali, Benin and Nigeria. Also they would make a League of Nations agreement between these countries stating that they will not take more than need. Noting that in a way there is already a treaty. The treaty reflects upon fighting poverty, and spurring economic development. The AWE would be responsible for taking the laws of this treaty with the eight other Niger River Basin countries into consideration before presenting the

idea of wanting to make water more readily available for Nigerians due to the construction of this project. Countries surrounding the Niger River could benefit from a design very similar within their own countries or territories. Those countries include: Benin, Burkina, Faso, Cote d'Ivoire, Cameroon, Guinea Conakry, Mali, Niger, Nigeria, and Chad. It is important that they let the other countries know that the increased crop production will allow for Niger to fairly trade with them and sell them more of their crops. In the end this could benefit them all while their cooperation would help to save the people of this country.

Since I am working with engineers and scientists I would write grants to help fund this project. Looking into foundation grants would give me the funds to provide salaries and build infrastructure. This would give me the funding to get AWE started, but to make it sustainable I would initiate a partnership. I would want this partnership to be with a university since my project offers an opportunity for education. That opportunity for education, presents itself through an internship. The university I would partner with would be the Institute of Technology in Zinder. I chose this school since it offers civil engineering, hydro geology and city planning majors. Because this school offers the majors needed to oversee my project, the partnership would send interns to work with my employees for experience and eventually to take over the AWE. By getting the people of Niger directly involved, my project will then become sustained by the citizens. With their own citizens running a solution, Niger will be given a sense of control and empowerment in themselves as well as their country.

My belief is that my idea could positively impact Niger for years to come. By giving the people water that they need to survive, thousands of lives will be saved while building up agriculture in this country. I realize that the use of drought resistant seeds and the improved practices coming with the use of technology to improve plant lines and production chemicals, such as fertilizer will also be very important contributors to the success of increased agricultural production in Niger(7). The bottom line is that the citizens of Niger are suffering. Regardless of whose fault it is or what caused this famine, it is our job to see that something is done. Much of the rest of the world has already managed to progress while leaving these people in the dust. Well, I am here to say all people are important. The people of Niger need our help and it is time to take more action. We must work together to make sure new technologies and innovations are available to all peoples of the world. I humbly suggest this water system as a contribution to help Niger continue its' efforts to improve the lives of its people.

## Works Cited

1. +R ASMUSSEN, susan. *Niger*. Countries and cultures, n.d. Web. 30 July 2012.  
<<http://www.everyculture.com/Ma-Ni/Niger.html>>.
2. Potts, M., V. Gidi, M. Campbell, S. Potts Zureick, V. Gidi, M. Campbell, and S. Zureick. *Niger: Too little, too late*. Guttmacher Institute, 2011.0.
3. < <http://www.guttmacher.org/pubs/journals/3709511.html>>.
4. Carr, Dana, and Elaine Murphy. *Powerful Partners: Adolescent Girls*. N.p., n.p. Web. 30 July 2012.  
<<http://www.prb.org/paf07/powerfulpartners.paf>>.
5. Lotta, R.. *Hunger crisis in niger: starvation by the market*. N.p., 2004. Web. 30 July 2012.  
<<http://www.stateofnature.org/hungerCrisis.html>>.
6. Wynn, Jean. "Niger" (2011): n. page. 0.  
<<http://education.stateuniversity.com/pages/1099/Niger.html>>.
7. Maps of World,. "Niger Climate." *Maps of world*. MapXL, n.d. Web. 30 July 2012.  
<<http://www.mapsofworld.com/niger/climate.html>>.
8. +“Fertilizer Suppliers Association of Nigeria.” MIS-Stekol, 2010. Web. Web. 30 July 2012.  
<<http://www.fepsannigeria.com/index.php>>.
9. “Africa and the world.” *Major problems facing niger today*. Africaw Group, 2012. Web. 30 July 2012.  
<<http://www.africax.com/major-problems-facing-niger-today>>.
10. N.P., 2011. 0.  
<<http://www.gafspfund.org/gafsp/sites/gafspfund.org/files/Documents/Niger-PAD.pdf>>.
11. +Bourneima Hama,. “Niger’s high birth rate caused by religion, poverty.” Agence France-Presse, 09 Aug 2005. Web. Web. 30 July 2012.  
<<http://reliefweb.int/report/niger/nigers-high-birth-rate-caused-religion-poverty>>.

