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Niger, Factor 6: Climate Volatility

Niger: Healing the Ecosystem

In 1962, Rachel Carson's book *Silent Spring* sparked a movement of heightened environmental awareness. Although the book addressed mainly the terrifying effects of chemical pollution, it resulted in an explosion of interest in all environmental issues (Story). In recent history, one of the most contested issues was whether climate change was a problem. However, in a survey conducted by the Center for Climate and Electricity Policy in 2013, 73% of Americans agreed that climate change is real (Surveying). Thus, it can be concluded that climate change is a pressing issue that the global community must adapt to if humans wish to survive. When humanity began the widespread use of fossil fuels, carbon dioxide emissions increased at a rate that outstripped the ability of plants to convert the CO₂ back into oxygen. Therefore, greenhouse gases began accumulating in the atmosphere of our planet. This created a blanketing effect that traps the sun's heat and increases the overall temperature of the Earth. As a result, the polar ice caps have begun to melt and bizarre weather patterns have formed. The consequences for the greenhouse gas effects are severe: rising sea levels, extreme weather conditions, and harsh storms name just a few (Global). Essentially, the climate is becoming more and more volatile. The climate volatility experienced around the world presents grave issues to nations that are still developing and rely heavily upon subsistence agriculture. One such nation is the African country of Niger. The purpose of this essay is to explore and establish potential solutions to the issues of climate volatility within the nation of Niger.

Niger

Niger is a landlocked, sub-Saharan state. It is geographically comprised of mainly desert, with a small savanna region in the southern tips of the country. In fact, only around 11% of the 1,266,700 square kilometers of Nigerien soil is considered arable and a miniscule 736.6 square kilometers of land are irrigated. From an economic standpoint, this is not of great concern: the Nigerien economy profits mainly from the mining of Uranium ore. However, when inspecting the distribution of labor within Niger, a severe imbalance comes to light. While most of Niger's profit comes from mining and other heavy industry, 90% of the workforce labors elsewhere: on small subsistence farms. This being the case, over 60% of the population of 17,466,172 people live below the poverty line (Central Intelligence Agency).

Typical Subsistence Farm Family

A typical subsistence farm family in Niger is very large since, as of 2014, the average Nigerien woman will give birth to six or seven children in her lifetime (Central Intelligence Agency). The family would likely practice Islam because nearly 90% of the Nigerien population identifies as Sunni Muslim. While many people in Niger share the same religion, there are quite a few different cultural subgroups. The most prominent ethnicity in Niger is Hausa, making up one half of the population. Other smaller groups are the Zarma-Songhai, the Kanuri, and nomadic groups like the Tuareg and the Fulani peoples (Our Africa). Thus, average Nigerien household would be persons of Hausa ethnicity. The six or seven children would stay home with a mother, who runs the farm, while the father leaves for months at a time to graze herds of livestock or find work in other countries. (Our Africa) The literacy rate in Niger is 28.7%, and those who are literate are mostly males. Furthermore, the average Nigerien only attends school for 5 years (Central Intelligence Agency). This means the education of a typical Nigerien family is incredibly low, and that daughters are often married at an extremely young age (Our Africa).

The tradition of having a large number of children persists primarily due to the influence of Islam and overwhelming poverty. Islam is a religion which views having many children as positive; therefore, cultural tradition dictates that a large family is important. Additionally, the immense poverty experienced by our Nigerien family means that they lack access to contraception and education about family planning. Unfortunately, the extremely dry climate of Niger makes feeding the numerous mouths of children arduous. The poverty typical in Niger results in severe health issues including stunted growth, malnutrition, malaria, diarrhoea, and cholera. State hospitals and medical clinics are ill-equipped to handle these illnesses, and there are too few facilities within the state as a whole for citizens to have easy access to medical care. As a result, a typical Nigerien family has little or no access to professional health care, and may turn to local healers that use herbal remedies when someone falls sick. The implications of restricted health care are grave: a woman in Niger has a 1 in 16 chance of dying from pregnancy (Our Africa).

Nigerien farmers rely heavily on the rainy season that lasts from May to September. During this five-to-six month period, crops are planted. Since the other half of the year is intensely dry and hot, it is vital that the crops grow quickly during the rainy season in order to feed farmers' families for the remaining months. A typical farm is 1.88 hectares, on which our archetypal farming family grows crops like millet and sorghum, which mature quickly (Sadiq). Other crops include maize, beans, pulses, and various vegetables, and many tend to livestock like cows and goats. Only very few farms are mechanized- the typical farmer uses rudimentary tools and practices shift cultivation (Lehner). Shift cultivation is the practice of planting on a section of land for one season and then leaving it to naturally regain fertility (Definition). Another common practice among farmers in Niger is for the father of a family to divide up his land among all his male heirs. However, this practice will eventually result in the subdivision of smaller and smaller plots of land available for planting on, yet more and more people to feed. Thus, subsistence farmers are extremely poor: the average Nigerien eats one meal a day, if at all. The staple in Nigerien cooking is millet and sorghum, which are made into porridge. Other foodstuffs include dairy products from goats and cows, and, on special occasions, meat (Our Africa).

Major Barriers

Regrettably, many Nigeriens are currently stuck in a vicious cycle of poverty. It is this cycle which acts as a major barrier to ameliorating the quality of life in Niger. Unable to invest in more advanced and efficient farming equipment or irrigation systems, farmers attempt to raise a good crop with only the rain and their basic tools. What little food they are able to grow goes immediately to the large family. One solution would be for Nigeriens to have fewer children, but the impoverished citizens have no means of family planning or contraceptives when the majority of society is focused solely on where their next meal will come from. Thus, more children are born and more mouths must be fed, but the same out-dated farming techniques are incapable of meeting that demand, much less increasing their yield. Therefore, the cycle of poverty is a firm barrier that completely blocks the chance of increasing agricultural production. Similarly, poverty bars Nigeriens from improved access to food markets and higher quality nutrition. Since nearly all farmers in Niger are focused on growing enough food to barely survive and the current family and technological situation prevents crop yield from increasing, there is no conceivable way for large food markets to be sustained. Practically all of the food produced by a farmer is consumed by their family. Likewise, since nearly all Nigeriens are poor farmers, they do not earn a wage with which to purchase food from a marketplace. Thus, the dangerous cycle of poverty has trapped Nigeriens, blocking them from turning away from subsistence farming and towards food markets and sources of adequate nutrition.

Poverty also acts as a barrier against Nigeriens earning a living wage or finding employment outside of subsistence agriculture. Since the vast majority of Nigeriens are subsistence farmers, there is no way for them to leave their farm in search of alternative employment. How would their family eat? Even

if a governmental agency hired Nigeriens to build public works or another job opportunity was handed to them, there would be nothing to spend the new wages on. There are precious few commercial farms in Niger, so any potential workforce outside of agriculture would have no way to purchase food. Thus, the poverty in Niger even goes so far as to prevent people from having careers and building up the economy.

Impact of Climate Volatility

However, the situation of poor farmers in Niger is about to go from bad to worse due to climate volatility. For the past 50 years, climate shifts have resulted in a steady shortening of the rainy season, harsh floods, and detrimental droughts (Climate Change). The overall effect on the environment of Niger from these climate changes is rapidly spreading desertification. With the shorter wet seasons, farmers are unable to grow a sufficient amount of food to support their families for the rest of the year, watering holes used by both livestock and humans dry out too soon, and the delicate topsoil is degraded and eroded. As mentioned, Nigerien farmers typically practice shift cultivation. While one part of their land lays fallow for a few seasons, naturally replenishing its fertility, the other part is planted on. This process is unsustainable, because the swift desertification of Niger will soon render shift agriculture impossible. As topsoil eroded by the winds and floods caused by climate change, the land that lays fallow will be incapable of reviving itself. Natural vegetation will be unable to grow in the soil that is constantly degraded not by farming, but by the natural forces introduced along with a changing climate. Therefore, the technique relied upon by millions will no longer work, and agricultural yields will simply shrink and shrink. Thus, it is evident that climate volatility plays a major role in limiting the amount of food a Nigerien family can produce.

The trends of climate volatility are measured by meteorologists and climatologists who examine global shifts in weather patterns, temperature, and greenhouse gas emissions. A subcategory of climate change, desertification is most accurately measured by examining the expanse of desert versus arable land on satellite images of various regions. In the late 1900's, when public awareness about environmental issues was just beginning to grow, there was a dramatic trend in the climate of Niger: the rate of desertification was accelerating rapidly (Abdou). Fortunately, international groups like the UN and local farmers managed to curb the issue with small scale solutions. They did so by initiating farmer-managed natural regeneration, or FMNR. The FMNR project focused on agro-forestry: the process of planting indigenous trees alongside other crops. Agro-forestry not only provides another source of food to the Nigeriens, but also helps reintroduce nutrients into the damaged earth and prevent soil erosion. Local FMNR projects in Niger have resulted in "5 million hectares of agro-forested land and an estimated 200 million extra trees" (Our Africa). As a result of their actions, the modern situation of desertification in Niger is not as desperate as it was decades ago, and Niger stands out as the only African Nation to not only curb deforestation, but actually reforest a portion of their land (Abdou). Despite the positive effects of FMNR, the global climate will continue to fluctuate, and climate volatility will continue to be responsible for the malnutrition and starvation of millions. Desertification is erasing the once healthy, natural ecosystems of Niger and placing a great pressure on the food security of the rural poor. Women in particular are receiving the brunt of the issue. As mentioned, Nigerien women generally stay home and tend to the farm while their husbands are away with livestock or work elsewhere. Therefore, when crops fail, the women of the Nigerien families are left alone to attempt to solve the issue. This burden goes on top of caring for the numerous children present in most Nigerien homes. Thus, the female poor of Niger are being stretched beyond reasonable limits by the issue of desertification and climate volatility (Our Africa).

By slowing the spread of desertification and lessening the negative effects of climate change, an enormous weight would be lifted from the shoulders of Nigeriens. With an improved ecosystem, crops would be able to flourish and poor farmers would be able to escape the brutal cycle of poverty that they are currently trapped in. Should the land be more fertile and droughts assuaged, agricultural yields would

increase. Thus, families would be able to feed themselves and potentially produce surplus. A surplus of crops will act as a catalyst towards a growing local economy, and will ease Niger's suffering. The factors that would improve if the negative effects of climate volatility were handled effectively include the conservation of the environment, the well-being of Nigerien women, the levels of malnutrition and disease, and the economy of Niger.

Outside forces will also worsen the effects of climate volatility. Urbanization, energy demand, and pollution are factors that perpetuate climate change and thus the volatility that Nigeriens suffer through. When more people live in urban regions, the demand for transportation and manufactured goods will increase. Concordantly, the demand for energy will also increase, since electricity and power are essential for our modern factories and transportation systems. Therefore, society will consume even more fossil fuels, which pollute the atmosphere with greenhouse gas emissions. Those greenhouse gasses will, in turn, worsen the situation of climate change. Thus, our typical Nigerien family will experience increasingly severe climate volatility will continue to suffer intense poverty for the following decades.

Solutions

The Millennium Development Goal number one aims to "eradicate extreme poverty and hunger" (Millennium Development Goals). In order to achieve this noble goal, the desperate situation of farming families in Niger must be addressed. My recommendation to lessen the negative effects of climate volatility is to restructure current agricultural practices in Niger.

One factor that, if addressed, would lessen the negative effects of climate volatility is sustainable agriculture. Should Nigeriens move away from the unsustainable practice of shift agriculture and towards planting techniques that preserve soil quality and prevent pollution, the process of desertification would slow considerably. For example, the Conservation Agriculture approach focuses on zero tillage of soil, crop rotation, diversification of crop planting, and permanent organic soil cover. This has been shown to improve the structure of soil: preventing erosion, maintaining fertility, and improving water retention (Conservation Agriculture). Furthermore, Conservation Agriculture's non-machine philosophy means that it will not be costly to the farmers. These features would be highly beneficial in minimizing the spread of desertification in Niger and improving the agricultural situation for the average farming family. Furthermore, because Conservation Agriculture is highly sustainable, its positive effects would last long term.

Instead of hurriedly planting grains that already do not meet the nutritional needs of the typical Nigerien family, we should look to local reforestation projects. As mentioned earlier, small groups in Niger managed to slow the spread of desertification to a slightly less concerning (but still urgent) rate through FMNR projects. I believe that the success of these efforts should not go unnoticed, rather expanded to a national- if not international- scale. Therefore, I propose that the Food and Agriculture Organization (FAO) of the United Nations should create an official Farmer-Managed Natural Regeneration Committee, which will travel to areas affected by climate volatility and do three things:

First of all, the representatives of the FMNR Committee should educate farmers about the importance of practicing sustainable agriculture. Farmers must be taught how to practice Conservation Agriculture and the benefits of implementing this farming technique. Furthermore, the committee should teach farmers about agro-forestry, such that both Conservation Agriculture and agro-forestry may be used in combination. The FMNR Committee would educate the Nigerien subsistence farmers about these topics in a culturally sensitive way. Thus, members of the task force must be thoroughly educated themselves about the demographics of the region they will be assigned to. This means that the members must be fluent in the native tongues and cognizant of the social restrictions placed on Nigeriens due to

their heritage and religion. For example, since the majority of farmers are female (as previously discussed), care must be taken to respect the social codes that Islamic women follow. Education is the key to empowering the people that suffer from climate volatility to improve their situation. However, if Nigeriens are to be profoundly impacted by the information provided to them by the FMNR Committee, they must be treated with respect and made to feel comfortable when interacting with the FAO representatives.

Next, the FAO should provide adequate funding to the FMNR committee to purchase and distribute a variety of indigenous tree saplings and crop seeds to Nigerien farmers. Ideally, the seeds and saplings should be purchased from farmers who have already implemented agro-forestry. That way, the economic benefit will go directly to Nigerien farmers in multiple forms. Because shifting an entire nation's agricultural practices is a long-term project, the FMNR should also supply short-term aid as the farmers begin implementing Conservation Agriculture and agro-forestry. Specifically, the FMNR should provide rain water collection tanks and food to the farmers to aid their transition to the new program.

Finally, the FMNR committee should follow up on the progress of the agro-forestry and Conservation Agriculture in Niger. Reports should be submitted to the United Nations General Assembly regarding the number of farms that have successfully implemented these practices, if the process of desertification has been slowed, the environmental impact of the practices, and the economic situation of the local communities. With these reports, the tactics of the FMNR can be evaluated and adjusted in order to fit the changing needs of the people. Furthermore, the report will set benchmarks for the progress in completing Millennium Development Goal number one: to eradicate extreme poverty and hunger (Millennium Development Goals).

Humans continue to demand fossil fuels, and thereby continue to emit large quantities of greenhouse gasses into the atmosphere. This continuation of unsustainable practices results in negative consequences that are felt across the globe, especially in Niger. Climate volatility caused by greenhouse gas pollution endangers the lives of an average Nigerien family by threatening their livelihood: faming. The rapid desertification of Niger—a direct effect of climate volatility—is decreasing the amount and quality of arable land. This poses a serious problem since 90% of Nigeriens are subsistence farmers who rely upon fertile land to survive (Our Africa). Fortunately for Niger, local initiatives to practice agro-forestry have effectively reforested parts of the land and prevented further soil erosion in that area. Should the concept of agro-forestry be scaled up and combined with the agricultural practice of Conservation Agriculture, I believe that the situation of Nigeriens could be drastically improved. The best way to implement Conservation Agriculture and agro-forestry on a national—if not international scale—is for the FAO to create a committee that educates the poor farmers that are directly affected by climate volatility on the practices of Conservation Agriculture and agro-forestry, provide necessary supplies to the farmers, and keep a regular report on the progress made by the committee. With direct action and organization, the negative effects of climate volatility can be assuaged and the quality of life of Nigeriens will increase to the level that they deserve.

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