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Niger: Factor 2: Water Scarcity

Niger: Irrigation to feed a Starving Population

Niger, once the center of one of Africa's greatest empires, is now notorious for being one of the poorest countries in the world. Years of political turmoil, coupled with coup after coup have left the country on its knees, leaving much of its population malnourished. The lush, tropical grasslands surrounding the Niger River are quickly eclipsed by the semi-arid desert regions which covers the vast majority of the country (Geesing and Djébo). Much of the population resides in the minuscule tropical region of the country, as sustenance is difficult in the desert regions which dominate the north of the country. The arid climate, coupled with a lack of irrigation, has left Niger prone to climate volatility as the country relies on a fleeting rainy season to provide the water necessary for agriculture. Seemingly incessant droughts have left Niger in a state of chronic food insecurity. The ignorance shown by former governments towards the dearth of food has exacerbated the crisis greatly, contributing to the extreme famines. Failed harvests have left much of the population malnourished, leading to many dying from starvation. The food aid provided by foreign powers can only serve as a temporary solution, as a permanent, long-term solution must be employed by the Nigerien Government in order to achieve food security. As shown through the many failed attempts at establishing a system of sustainable agriculture in Niger, the development of an irrigation system seems to be one of Niger's few remaining chances to solve its ever-lasting food crisis.

In order to thoroughly explain the food crisis in Niger, we must first examine the nuances and downfalls of its economy. Niger is currently one of the poorest countries in the world. Weakened by decades of political turmoil and its dependence on an export economy has left Niger unable to feed its people. The majority of the population is employed in the agriculture industry (90%), and much of the remaining population is employed in Niger's uranium mining industry. Although the majority of the population is employed through agriculture, Niger's copious amount of uranium is the country's main export. Its dependence on the export of uranium has contributed to the stagnance of the Nigerien economy, as the price of uranium has been dropping since the 1980's. This drop in price has also discouraged foreign investment, limiting Niger's chances for development. For the time being, the country relies on foreign aid to provide the capital needed for both governance and to provide food to its people, but this cannot last forever. Establishing a reliable source of water for agriculture has the potential to bring new industry to the country, thus supporting the economy as it attempts to overcome both economic stagnance and cyclic poverty.

Along with economic weakness, the marked political instability of Niger also presents a great threat to achieving food security. Since its independence, the government of Niger constantly faced the imminent threat of a coup. Eleven different governments have been established in Niger since its founding in 1960, and the regularity of these military takeovers shows no signs of slowing down as the most recent attempted coup was in 2011 (Whitaker). In a country as poor as Niger, rampant corruption is ubiquitous in the government, the only place where one can hope to escape the cyclic poverty that the vast majority of the population is trapped in. Many military generals have exploited this corruption, using it as a pretext to stage a coup, when in reality these generals crave only wealth and power. Political instability has also led many politicians, most recently Tandja Mamadou of the former government, to refuse the existence of any sort of food shortage and famine, thus refusing foreign aid and dismissing workers from NGO's such as the Red Cross (Greenslade). The result has been horrific to those hoping to achieve food security, as drought after drought has continuously plagued the country, leaving many to starve as food aid is rejected by the government. But despite the obstinate history of the government, the new government, established in 2010, has shown a willingness to cooperate with foreign powers and NGO's to work to achieve food

security in Niger. Given the short amount of time they have been in power, the new government has failed to make significant advancements in this endeavor, but the new government has shown an unprecedented willingness to achieve food security, something which has been applauded by NGOs and foreign powers alike.

The typical Nigerien family is one of the largest in the world, having around eight children per household (IRIN). With such large families comes a large population growth rate, which is estimated to be around 3.1% annually. This rapid population growth is putting strain on the already stretched public healthcare and education systems, and if the growth rate of the population doesn't slow down, the implications on these public services will be catastrophic. As a result of the population boom, the country may be unable to lift itself out of the poverty it is locked in, as public institutions would be unable to support the proliferating population. One concern over the explosion in the population is the pressure that would be put on primary schools and teachers, as the population already has an unequal proportion of youth to adult population, with 47% of the country's population is under 15 years of age (Diop). The overcrowding of schools, which is the inevitable result of this unusually large youth population, decreases the quality of education in a country where the public education system is already very poor, inhibiting upward social mobility to the point where it becomes virtually impossible.

One of the key factors which has led to the population boom in Niger is the country's lack of an educated population. Although attending school is compulsory for all children from ages 7-15, this law is rarely followed due to financial qualms, and the literacy rate remains at a dismal 15.5% among adults (UNICEF). This lack of education, coupled with Islamic values, has led to women to bear many children and to evade the use of birth control (UNICEF). Many lack the knowledge to see the risk in having so many children as they are blinded by idealist Islamic values and societal expectations. Although many criticize the Nigerien population for ignoring education as an unnecessary accessory to life, the population have good reason to believe this way. The public education system in the country is dismal, often times failing to teach their students basic arithmetic and English. The typical public school in Niger, which is meant to provide at least a rudimentary education to its people, is a stark contrast to those present in the developed world. The well-polished, expensive buildings present in developed countries like ours differ greatly from the decrepit buildings used as schools in Niger. The gap in the quality of the buildings accurately reflects the gap in the quality of public education between Niger and the developed world, as the ailing country struggles to provide its population with a proper education.

Similar to education, access to health care is also limited in Niger. Suffering from chronic underfunding, the public healthcare sector is failing to provide to its people. Even in the capital, Niamey, the lack of equipment and medication has rendered many public hospitals virtually useless (Our Africa). As a consequence of the underdeveloped education system, there is also a lack of trained medical professionals, and the few present mostly work for private hospitals as they give significantly better pay. The inefficiencies and expense of the public healthcare system have led many to seek the help of traditional healers, who use herbal medicines. These methods, as expected, fail to treat major diseases, leading to perennial outbreaks of diseases such as malaria and cholera which plague the country as a result of poor sanitation.

Also, the lack of arable land in Niger has had many consequences, one being the miniscule size of farms in the country. Since the climate of Niger is mostly dry and semi-arid, only about 12% of the land is arable. This leaves the 90% of the population who are employed in agriculture to have little land to work with, leading many farmers to have little to no money to spend on basic necessities, a result of the low agricultural output. The miniscule farm size has also hurt agricultural productivity and efficiency, thus furthering the food crisis (Haspel). A poor salary often leaves farmers unable to provide enough food to feed their own families. This dearth of food, coupled with Niger's incredible fertility rate, has led to

famine after famine, as the growth in the food production is incapable of keeping up with the proliferating population (IRIN).

For centuries, the residents of the area that is now Niger have relied on sorghum, millet, and cassava as their principle cereals. These staple crops, which still remain today as the central part of the Nigerien diet, are consumed daily in relatively large quantities, consisting of about 80% of the average Nigerien's caloric intake (Mitchell 110). Although these crops, along with the slightly cheaper substitute of rice, are grown in relatively large quantities in the Upper Niger Delta, the amount cultivated does not suffice to feed the number of mouths needed to be fed throughout the country. The lack of these staple cereals has led nearly all of Niger's population to cut down on food intake in order to preserve food from harvest to harvest (ACAPS). The cultivation of these staple crops is also heavily dependent on rainfall, leaving their growth extremely vulnerable to climate volatility. This vulnerability has been met by attempting to incorporate inexpensive water-conservation techniques into traditional agricultural practices.

Despite the implementation of various agricultural practices in an attempt to maximize output, such as the use of drip irrigation and water microcatchments, reaching adequate nutrition has been difficult for the majority of Niger's population. The dependence on seasonal rains to supply the water necessary for cultivation has left Nigerien agriculture extremely vulnerable to climate volatility, as shown during the 2005 and 2010 famines. Simply put, the water necessary for agriculture is not present, and no efforts to reduce water-usage seem to change this stark reality. The micromanagement of farms in response to the lack of both water and arable land has prevented farmers from earning a living wage, leaving many hungry and without food (Haspel). This widespread hunger is accurately reflected upon by the country's very poor HDI, which ranks Niger with the least human development out of all 187 UN-member countries. With more water available to farmers, the bleak state of Nigerien agriculture can change into one which provides thoroughly for its people, with the ability to lift the country out of poverty.

Although the agricultural sector employs the vast majority of Niger's population, the lack of water to supply the fields prevents the country from achieving permanent food security. As stated previously, around 60% of Niger is arid desert, which receives less than 10 inches of precipitation annually. The majority of the remaining 40% land is semi-arid, with only the southernmost region considered tropical. This has led to the adoption of water-conservation techniques such as the use of drip irrigation, but despite these efforts water shortages are ubiquitous in the region. Alternative solutions have also been implemented, but these have failed to make a considerable impact, and have resulted in only negligible improvements if any to the crisis as people continue to starve.

As stated in the previous paragraph, one way in which water scarcity is currently being dealt with is by encouraging rural farms to adopt inexpensive methods of water conservation, though many of these methods fail to make the huge impact necessary to feed the millions who remain hungry. An alternative solution to solve the crisis was to introduce new crops which require less water to grow, such as the *Ziziphus Mauritania*, to Nigerien farmers in an attempt to increase yields in the semi-arid regions of the North. However, these efforts soon went to waste as harvests of these crops were hindered by infestations of fruit flies and other insects (Orwa et al). These infestations leave the success of harvests extremely dependent on the presence of very few insects, as shown during the locust swarms in 2005, where swarms of insects known as the desert locust damaged these alternative crops, which led to a great food shortage and famine. Erratic yields, a necessary consequence of insect swarms, have also led to fluctuation in the price of grains. This only exacerbates the food crisis and makes it extremely difficult to achieve food security.

Water scarcity in the semi-arid northern regions of Niger has rendered much of the land unfit for cultivation and has fostered the process of desertification, which plagues the Sahel region. This, along with the small size of farms, has hurt agricultural productivity as well as food availability and

accessibility, as many harvests have failed as a result of droughts. Every drought brings upon higher food prices, leading even the most basic food to be inaccessible to the 63% of the Nigerien population which falls under the national poverty line of \$1/day (Food Security Portal). This deprives the population of vital nutrition (Jin, Yu, Johnson, and Muraoka), leaving many to starve, and those who survive to not have enough to eat.

Therefore, the only plausible solution left is to tap a new source of water to provide for farms across the country, and the Niger River provides just that. Although the river has the potential to irrigate over 222,000 hectares of land, the river currently irrigates a mere 10,000 hectares (Frenken and Faurès). This discrepancy shows both the potential for Nigerien agriculture and the bleak state which it is currently in. Inefficiencies similar to this have led to the starvation of thousands of Nigerien people, leaving many more to suffer from dietary illnesses. Nevertheless, an improved irrigation system is vital for Niger to achieve permanent food security.

Improving access to water for rural farmers in the drought-stricken regions of Niger will drastically increase the amount of food produced in the country. With the vast majority of Niger's food coming in the form of international aid (USAID), the yields from local farmers fall well short of the amount needed to sustain the country's population despite the introduction of alternative methods of cultivation aimed at reducing water-consumption in agriculture. Improved irrigation and infrastructure will give farmers the resources they need to support large-scale agricultural fields, thus increasing yields, and in the long run, providing a solution to the food crisis which plagues the country. By increasing yields, the price of staples such as sorghum and millet will decrease, making food more accessible to the general public in large quantities. This cyclic production of surplus after surplus will allow many people who were once below the national poverty line to be able to afford a decent meal, and will eventually culminate in many overcoming poverty (Jin, Yu, Johnson, and Muraoka). From an economic viewpoint, increased yields will provide the backbone needed for the development of the nation. Niger, which currently ranks last of all the 187 UN nations in HDI, is one of the least developed economies in the world (World Food Programme). By providing the economy with a solid agricultural backbone, economic development and specialization will have a foundation to grow upon, as one would have to spend less time worrying about feeding their families and will have more time to focus on other ventures which they may have in mind (UNCTAD). Thus, my suggestion for improving food security in Niger is to invest in projects which aim to increase the irrigation of the major water source in the region, the Niger River.

The most prominent project which aims to provide irrigation to farmers is the construction of the Kandadji Dam on the Niger River. This is one of the few state-sponsored infrastructure projects in the country, and the government has attracted considerable foreign investment for the project. Foreign investment from sources such as the Islamic Development Bank accounts for the majority of the funding for the project. Although it is being built to serve several purposes, one of its fundamental purposes is to allow for the irrigated agricultural development of the Upper Niger Delta, with its final goal being to develop 40,000 hectares of irrigated agricultural land (The World Bank). If this project proves successful, yields will increase greatly, which will bring the price for bare necessities such as grains down to one affordable for the general public. If scaled up, this project has the potential to irrigate land throughout Niger's central valleys, a result which will increase yields dramatically. This project can also pave the way for providing similar projects, such as the Ruwamu Project, which aims to irrigate the most drought-stricken regions of Niger, with the funding necessary for its development. The combination of these projects has the potential to solve Niger's food crisis.

My suggestions for what role each institution should play in the development of an irrigation system in Niger is as follows. The government should play a more proactive role in the development of these irrigation systems. Although many cheaper alternatives have been introduced by NGO's to the semi-arid regions of Niger, all have failed to solve the food crisis. Irrigation systems, despite being relatively

expensive to build, are the best and most efficient way to achieve permanent food security. In order to gain the capital required to build these systems, simple investment by NGO's will not suffice. The government must play a more proactive role to attract international investment in these irrigation projects. As seen through the funding of the Kandadji Dam, the government more than capable of attracting foreign investment and capital into these projects, but this is only possible if the government shows the same enthusiasm and involvement it showed in pursuing this capital. Despite the political turmoil which remains in Niger from coup after coup, as the country makes its permanent transition to democracy, achieving food security and providing for its people should hold as high a priority as achieving permanent political stability.

Along with proactive government support, NGO's should play a role in raising awareness about the severity of the crisis to the public. The food crisis in Niger is responsible for the deaths one in every five children before they reach the age of five, and a large number of those who live past this age suffer from acute malnutrition and stunted growth. The lack of public awareness about the food crisis is appalling, as millions die every year from chronic malnourishment and starvation. NGOs such as the Global Poverty Project, whose main goal is to raise awareness about poverty and hunger throughout the developing world, should raise awareness about the hunger crisis in Niger to attract donations from the public. The donations which they collect can then be used to develop sustainable agriculture supported by irrigation. They will also catalyze the building of the infrastructure needed for irrigation as a steady cash flow will be created.

Finally, the community can be involved by helping to construct irrigation systems. Like all other projects, people will be needed to construct a variety of the parts of the irrigation system. Rather than using migrant labor, which many developed countries use to build major projects, local labor has intrinsic benefits which are beneficial to both the developing economy and for the project. It will give many a source of income which they desperately need, and it will curtail the cost of construction, giving the project efficiency and providing the community with tangible benefits immediately.

When bringing up the topic of Niger, many simply shake their heads, expressing sadness at the thought that solving its problems is virtually impossible. The political instability and rampant poverty which have plagued the country since its independence have led many to believe that there is no feasible path to reach economic development and food security. Unable to provide its population with proper healthcare and education, Niger has locked its people in cyclic poverty. But now we can see that despite being one of the poorest countries in the world, Niger is full of potential. As its largest river is untapped, simple irrigation can pave the way for agricultural development in the semi-arid regions which were once unable to sustain agriculture. The droughts which have plagued the country for decades will cease to destroy harvests, as irrigation will provide these regions with the water necessary for agriculture. The hungry will be fed by the significantly larger yields, allowing for many to be able to rest at night without having to worry about how they will feed their family the following day. Irrigation can open up all kinds of doors for the people of this country. Without food shortages, many can now focus their attention onto the cities, opening the floodgates to the many opportunities present in a capitalist economy. This will pave the way for Niger's modernization, leading to a permanent solution for its economic and political qualms. The possibilities are endless, and irrigation can make all of these possible.

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