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Chad, Africa - Sustainable Agriculture

### **Chad, Africa: Probable Solutions for Real Problems**

Hello, I am Jagger Ferrie. I am an eighth-grader at South Hamilton Middle School High School. Today I will be explaining the country of Chad, Africa and the people called Chadians. Chad faces many problems in the modern world. Some of these problems include sustainable agriculture, infrastructure, clean water, populations, conflict, water scarcity, and malnutrition. But today I will be focusing on the unsustainable agriculture part of Chad. Agriculture such as plants that don't grow and livestock that don't live. Solutions for these problems include pre-germinated plants and ways to help livestock survive. I'll also include suggestions to help the plants grow and ways to help the people stay organized with both their livestock and their homes.

Chad is a small country in Africa. The country has a total of 495,755 square miles, with a total population of 10,238,807. Chad's land is dry and has little to no water. The soil is filled with diseases that make it unsafe to grow plants, that's if they can get plants to grow. This poor country depends on farmers to grow what food they can. Farmers try their best to grow cattle, goats, chickens, and vegetables. These goods are later sold at the market. As a result of the poor soil condition, malnutrition is a common theme throughout Chad. There are very few plants and very high temperatures. These temperatures may rise as high as 120 degrees Fahrenheit. These high temperatures are the cause of many deaths each year. On average, Chad will receive about 5 inches of rain yearly. There are many bugs and they also carry diseases. The Northern half of Chad consists of a hot desert region. Southern Chad is covered with fertile land. The Northern and Southern halves of Chad are separated by a small strip of savannah. Seasonal rivers flow through the North, while the South has rivers that flow year long. These rivers don't provide the country with safe water though, as they are filled with diseases such as malaria and yellow fever. Lake Chad is located in the Southern half of Chad, providing little safe water. In 1973, authors J. Lemoalle and B. Dupont quoted in their *Ores in Sediment* book they wrote, "The present chemical condition led to a scheme of iron behavior... which becomes unstable in the lake, and forms a coprecipitate with silica." (Iron-bearing Oolites and the Present Conditions of Iron Sedimentation in Lake Chad (Africa)) Oil is their only source of energy in Chad. Conflict developed when the Northern half enslaved the Southern half of the country. France later enslaved all of Chad. Finally, in 1960, Chad became independent from France. This created a Civil War between the people on how they should be governed. This civil war ended in 1967. At that time, an interim government, or emergency government was set up to govern the people. This government was left in place until 1993. Idriss Deby led the government and led them into a Presidential system. To this day he still leads the government. The people are referred to as Chadians. The main languages are a combination of Ancient African, Arabic, and French. Trips to the market to sell and buy may be the only time a person leaves the house. Both the men and women work hard to get what food they can. Both males and females lack literacy. Families usually consist of 5-6 kids plus the mother and father. It is not unusual for some families to be polygamous, or to have multiple spouses and children. Multiple families may live in one house with their extended family members, making living space very tight. The wealthier family members are expected to help financially. Everyday tasks within the home include cooking, cleaning, child care, and running the household. People may leave the house to go shopping at the market, get water or firewood or sell off-season foods. Due to poverty, many kids will go to work at a very young age and live at home until they are married.

Connections can be made when reading about Chad. You will notice that they cannot sustain their agriculture. Vegetables don't grow and livestock doesn't survive long enough to be used for their meat.

People are so low in poverty that they can't buy any goods. Even the people and buildings don't develop. In 1987, the Cambridge Press wrote, "The real problem in Africa is poverty - the lack of development - the seeds of which lie in Africa's colonial past and in unwise policy choices made in the early days of independence by national governments and external aid donors." (Drought and Hunger in Africa. United Kingdom, Cambridge University Press, 1987.). I'd like to focus on Northern Chad, as this is where they have the most trouble surviving. Northern Chad is in a very deep hole when it comes to agriculture. At this current moment, they are considered to be critically affected by hunger and they are rated as the number one country in terms of starvation. Their starvation numbers are slowly increasing. Chadians try to buy plants with what they can and then grow the plants. They till the land, overworking the already poor land. Then they try to plant what they have. They use what little water they have to try and grow food. But their hard work comes with little success. When plants do grow, pests tend to eat them or the hot temperatures kill them off. Many kinds of livestock can be found throughout Chad, such as cattle, chickens, and goats. They work hard to keep their animals alive by feeding, watering, and caring for them. But oftentimes, people have to choose between feeding the livestock or feeding themselves. People become hungry when their cattle, chickens, and goats thin and die. The people become hungry and eventually die with no vegetables or livestock to feed themselves. The families sell most of their belongings to receive even a few dollars to buy food. Once the money runs out, so does the food. At this point, a family's only option is to move to a relief camp to be fed. Even at the relief camps, there isn't always enough food to feed every person there. The younger kids are usually the first to die. The youngest usually consist of ages of newborn to the age of five. These kids have a higher metabolism and are still growing. Without the proper food and nutrition needed, they quickly become malnourished. The elderly are normally the next to die. When families make the long trip to relief camps located in Sudan, the elderly simply don't have the energy to make the trip. The government knows this problem exists, but they can't do much to help. President Idriss Deby works to keep the rebellious people of Chad calm. He does what he can to increase profit, but it isn't enough to make a difference. The majority of the money made is spent on weapons rather than on food. In 2006, Simon Massey and Roy May wrote, "Many Zaghawa, including members of the armed forces and some members of his extended family, are infuriated by his management of Southern Chad's Doba oilfield, the proceeds of which they suspect will arrogate for the benefit of his immediate family." (Commentary: The crisis in Chad, African Affairs, Volume 105, Issue 420).

Using the valuable information I have researched, I have worked to create probable solutions and suggestions for solutions. I believe that the first step to solving the problem of unsustainable agriculture is to first begin by having the people of Northern Chad stop tilling their land a year in advance. When the ground becomes overworked, it turns to sand. Then the nutrients of the once healthy soil disappear into a sand-like particle. To reverse this process, Chadians simply have to stop tilling. Lee Reich wrote in the Fine Gardening Magazine, Issue 112, "Nature can handle its own tilling." (Fine Gardening, Issue 112, Lee Reich, 2021). There is even one more step these farmers can take, have their livestock stop grazing the land. When any animal grazes on the field, it pulls roots out of the ground. These roots, that are holding the soil and nutrients together, allow the soil to turn to sand. It also compacts that soil tighter making it harder to grow plants. In 2009, the National Wildlife Refuge System stated, "Grazing animals... break up soil surfaces... and compact soils." (National Wildlife Refuge System, Management Methods: Prescribed Grazing, 2009) These two major actions can help to better the soil and further the growth of plants. Meanwhile, we can start to make a difference in our very own homes. As you can see, Chadians can plant the seeds, but they don't grow. The process of a seed to a sprout is called germination. We can plant our own seeds at home and allow them to grow in pots. Plants that would grow well in Chad include rice, carrots, and lima beans. Cabbage and broccoli can grow but may require more water. These plants only need to germinate. The average time for a plant to germinate is anywhere between 4 days to 2 weeks. I also recommend taking Acacia Albida trees to Northern Chad. Acacia Albida trees help to hold the soil together and they grow well with little to no water. Once the plants and trees have germinated, we

can consider the plants ready to take to Chad, Africa. People can also begin to donate bottles of water. With the water, we should also take fertilizer, to feed the plants. I suggest bringing a team of ordinary people to help fund and lead the project, people who just like all of us, want to make a difference. To get these plants and materials to Chad we should take them on a cargo plane. I also suggest bringing a plane big enough to carry at least two skid loaders, or at the very least two more planes to carry these large machines. If an excavator is too much to ask, I think we could settle for a handheld auger. The excavator or augers can be used to drill holes for wells. The safest place for the cargo plane to land is the Faya-Largeau Airport. This would be the safest since it takes many people in and out, plus America has flown aid into that same airport. Once the plants arrive in Chad, we can begin to plant them. To transplant, we should start by digging holes, then placing the germinated plant in the hole. To kickstart the growth of the plant in its new home, we should water the plant, then give it fertilizer. Then cover the sapling with soil. The plants need to be planted in a simple technique called strip cropping. We simply have to plant the saplings in rows and have savannah grass separating the rows. A suggestion to further advance the growth of the plants would be to plant in ditches or small hills. This allows any rain that may come to flow down to the crops. And if we want even further the growth of the young plants, we can contour plow. Contour plowing first occurred in Ancient Greece and is used to catch the rain. For the plants to grow healthily, we need to keep dust away. A technique used in ancient Chad and even used today, building grass fences. Grass fences are simply made by tying sticks onto savannah grass. The savannah grass can be found in the savannah separating the Northern and Southern half of Chad. And the sticks can be taken from the many random trees growing throughout Chad. These few steps will help our small saplings to grow into healthy food for Chadians. To further hold the soil together and to keep the dust out of the garden, we should plant the Acacia Albida trees all around the grass fences. These trees can be planted in the same fashion as the saplings were. The average time for a plant to get used to being transplanted is six weeks. Plants are not the only thing that doesn't survive, but also animals. The plants grown can be used to feed cattle, chickens, and goats. As the plants, trees, and animals are growing, we can continue to help the advancement of these plants. I further suggest that if augers or excavators are brought, we use them to drill wells. An average well could be anywhere from 100-500 feet deep. Some augers are as long as six feet, which if we are lucky, could just happen to be deep enough. If we are even luckier to have excavators, we can drill deeper than that. The well water could be used to water plants and trees. And it would aid in the next step of my plan. The next major problem in Chad is housing. Families lived in one small crowded home, with their extended families. Assuming that we can drill a well deep enough, we can use this water to not only grow plants but to also build houses. Houses can be made by simply stacking adobe bricks. Adobe bricks are bricks made from sand, grass, and water. Adobe bricks are easy to build and inexpensive. In 2001, Samali B. wrote this about adobe bricks, "The proposed system is effective, simple and widely adaptable to a variety of materials and locations." (The Getty Conservation Institute, Adobe Project 2006, 2009-01) The sand can be taken from wherever we plant the saplings in Northern Chad. Grass can be taken from the savannah. And if a well isn't possible, we can bring even more bottled water. On average, adobe bricks take three weeks to dry in the sun. But with the extreme temperatures, it could take less time in Chad. These bricks can be used for more than just homes. I suggest using these bricks for the livestock as well. We can build adobe fences around the cattle, goats, and even the chickens. This will keep the animal from grazing on the plants and ground that is used as the garden. It'll also allow them to live in a reserved area that will not cause the Chadians to stress about where their livestock might be. The final project should have a simple layout. There should be a garden planted with rice, carrots, lima beans, cabbage, and broccoli using the technique called strip cropping. This garden is surrounded by savannah grass fences and the fences surrounded by trees. An adobe house is built next to the garden and an adobe fence for animals on the other side of the adobe house. Multiple homes, gardens, and fences could be built making a small adobe community. This whole project for one house could take a minimum of two months. If we have enough people, we could complete at least two more homes in the same amount of time.

In conclusion, Chad may be a small place but it is home to large things. Large problems for that matter. Problems such as unsustainable agriculture like the plants or the animals. Luckily, solutions can be found for these problems. As a quick overview of my plan, we can have people grow plants such as rice, carrots, lima beans, and even cabbage or broccoli. Ordinary people will help to fund and lead the project. Suggestions to make an even bigger difference are to build adobe houses and adobe fences. Even drilling wells could be a major help to the economy. Thank you all so much and I hope we can work together to make a better world!

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