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Chad, Sustainable Agriculture

Allowing Chad's Agricultural Independence

Waking up knowing that there's food to eat and going to bed full is not something that most families in Chad experience. With frequent droughts, lack of technology, limited income opportunities, and flooding numbers of refugees and internally displaced people, it explains why 32% of people are malnourished. Malnutrition can decrease by achieving and maintaining sustainable agriculture techniques for long lasting food sources.

Chad is a land-locked, middle African country. There are 17,414,108 residents, 24% urban and 76% rural (CIA 2021). The northern half of Chad is in the Sahara Desert and the southern half has more of a tropical climate and it is where most crops are grown. The climate is typically hot, dry, and has periodic droughts.

The average farm size in Chad is 2.5-5 acres (World Food Prize Foundation 2019), which is around 2-4 American football fields. About 39.9% of the land is cultivated and some major crops are millet, cotton, peanuts, rice, corn, and cattle (CIA 2019). The average family size is 8-9 people and their diet consists mostly of porridge made from millet or corn along with dried fruits and beef or fish occasionally. Okra and Cassova are the two most common vegetables eaten with porridge. Typically in the south, you'd rarely ever have meats and mostly spices and grains.

Overall, Chad suffers from three main larger problems: frequent droughts, malnutrition, and regional conflicts. Chad already faces drought mostly in the North which is in the Sahara Desert but the southern part has been experiencing drought with the decreasing amount of rainfall (AGU 2019). With droughts, rapid desertification has been appearing and destroying the soil making it harder to grow crops. Along with the droughts, Lake Chad, the main surface of water, has shrunken 90% since the 1960s (Down to Earth 2021). As of now, there are around 480,000 refugees and asylum seekers in Chad (the UN REfugee Agency 2022). With the amount of people coming in and Chad already having 42% of the population in poverty, it is clear the large amounts of people coming in will make Chad's food security worse. In total, 43% of the children in Chad under the age of 5 are stunted. The European Commision thinks that with the help of treatment programs the number will go down to 37% by 2021 (Borgen 2019).

Even though Chad statistics don't seem encouraging, they are getting better by receiving help from outside countries and programs. For example, each year 62% of food given from outside groups comes from the U.S. In-Kind Food Aid; Local, Regional, and International Food Procurement 24%; cash Transfers for food 8%; Food vouchers 4%; and Complementary Services 2% (USAID 2020). Even though there is aid Chad needs to be able to get more food out of the land they are already using or at least try to replenish it.

What has Chad already done to help replenish the soil? Over 30 million people depend on Lake Chad in 2021 (Down to Earth 2021). Chad has recently come up with solutions for reforestation.

The Minister of Ecology signed a partnership agreement with UNDP (United Nations Development Programme) with 1.7 million dollars to restore registration around the lake (OCHA 2018). Drought-tolerant seedling, not specified, has been planted on over 4,000 hectares (OCHA 2018). The UNDP has also planted around 40,000 acacia trees at Merea, Liwa, and Tantaverom sites (OCHA 2018). Acacia trees are large shrub trees that absorb gas in the air and turn it into Nitrogen in the soil that the plant needs (Wilson Center 2020). Basically it fertilized soil that has been destroyed by deforestation. The roots also reach deep into the ground so they can survive the droughts in Chad.

Another solution that UNDP came up with involved the communities that surround Lake Chad. Around $140,000 worth of agricultural kits have been sent out by the UNDP (OCHA 2018). It was estimated that 4.8 million people would benefit from the project (OCHA 2018). This seems like a solid plan but there's about 30 million people in total that need support that was presented by the UNDP. If more kits and acacia trees were planted in other communities, then maybe it could have a bigger impact on reforestation efforts overall.

In order to replenish the soil from years of environmental degradation and desertification farms all over, Chad should introduce the Zai farming technique. Zai farming is basically digging small holes about 20-30 cm wide, 10-20 cm deep, and 70-80cm apart from each other which in total would lead up to 10,000 holes per hectare (Journal of Economic Structures, Article 32, 2019). Each pit would then be filled with manure, also known animal dung, also biomass can be used. Chad would have no trouble finding manure based on the amount of cattle and goats they have. Chad has roughly around 29 million cattle (International Trade Administration 2020). Then, after the pits are ready the seeds are planted. Using the Zai method would be very beneficial for Chad because the manure and or biomass attracts soil insects which will maintain the soil quality. The soil then will collect the first bit of rain and will last longer with all the nutrients that came with the manure. An added bonus is that when millet is planted the soil protects the millet from the wind. Overall, the Zai method was built for droughts which occur all over Chad.

The only disadvantage is that this method is a newer method being developed in the 1960s and hasn't been experimented on that much. But there have been a couple countries that have even used it and have seen some results. For example, thanks to Yacouba Sawadogo, Burkina-Faso, a country that relies on agriculture, has now had an increase in the production of millet (International Trade Administration 2020).

The plan for Chad would be to start using the Zai method in the south where most farming takes place. Since the soil farthest away from the rivers is the driest, starting in those areas would be more beneficial because they are the most damaged and therefore need the most time to replenish. Since Yacouba Sawadogo saw success in the millet, millet should be grown first. Each year the pits could be moved over a few centimeters so that every inch of the soil can go through the fertilization process.

If Chad had a way of producing more food on their own, then they would maybe eventually not need to rely so much on other countries and programs. If the Zai Farming succeeds, expanding smaller farms, especially in the south, could be the first few steps to getting Chad on its own feet.

While help from others is working, it is still not enough with all the refugees coming in from neighboring countries.

While Chad is the most common known water source in Chad, there are also aquifers. By definition, an aquifer is a body of permeable rock which can obtain or transmit groundwater. Basically, it's a space underground below the soil that has collected water. If you look on a map you would notice that there are aquifers that run away from Lake Chad and through the country. The way to reach the aquifers is to drill a well and use a pump to get the water to the surface (Groundwater Foundation 2022). There are already 856 wells that were built in Chad by the PAEPA (Rural Drinking Water and Sanitation Program). Now in southern Chad, access to drinking water has increased by 60 percent (OCHA 2020). Hopefully the PEAPA continues to build more wells since they are producing positive growth in drinkwater sanitation. With more drinking water available, theoretically, it should allow the lake to be used for agriculture purposes. The disadvantage to this, is that the water will not be used for crops, which crops really need water to survive though droughts.

Even though Chad is known for its droughts, there is a rainy season that takes place from May to October (Reuters 2022). Climate change has made Chad's rainy seasons intense and more likely to cause flooding. During that time, Chad should put out rain barrels and collect rainwater. If done properly, rain barrels can hold rain for up to 5 years (MyWaterEarth&Sky 2022). To prepare the rain barrel, first place the barrel at the downspout of the roof and let gravity do its thing. Next, pour bleach into the barrel and rinse thoroughly. A pre filter is set up before it collects rainwater. A H2O preserve is also added along with the filter. Once the barrel is full of rainwater, it must be stored off ground in a dark area away from the sun (MyWaterEarth&Sky). This solution is probably the easiest way to collect water for community farms. The disadvantage of this is that most homes in Chad are not built like traditional homes. So in order to do this some form of gutter systems would have to be set up which takes a lot of time and is inefficient.

For every one of these solutions, Chad needs money to support the supplies and operations. Another Resource Chad uses for agriculture is oil. It's the one resource that has been harvested with most sustainable success. Around 90 percent of oil production is exported (International Trade Administration 2020). According to the OEC, Chad makes about 1.5 billion dollars a year on exported oil. Chas also has enough oil to last 1,788 years at its current consumption rate (Worldometer 2016). Chad should invest into more oil production and earn more on exports and use money for farming.

When all solutions have taken place, water should become more available for different uses. Soil should also be more stable and capable of growing more crops and expanding beyond the millet. Along with expanding varieties of crops, hopefully the number of crops surviving through the drought will increase because of the Zai farming ability to protect the millet from the wind and provide some soil insects to keep it fresh. It is known that the Zai method and mass production won't completely get rid of hunger and it won't provide the greatest outcome for malnourishment but it should hopefully make Chad a bit more independent and more reliable on their own natural resources.

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