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Chad, Factor 1: Plant Science

Chad: Producing Higher yielding crops

It is second nature for Americans to go into our pantries and get a snack but for many places, having enough food is hard to come by. Millions of people from many countries go hungry and need food to fill that void. Chad, a country who has fought for survival, is also one of the most food insecure countries on Earth. With 34.5 percent of its population undernourished in 2014, Chad had a high rate of food insecurity (FAO). Due to such poverty, most of the population does not know where their next meal will come from. The future of Chad could include a habit of grabbing a snack that would be readily available instead of millions wishing for the next meal.

In the past Chad has been a top producer of dates and cotton, but since the late 1970's droughts have slowly become more common (Climate). With these droughts the farming landscape in this African country has slowly withered. Many people in Chad are illiterate and have had little to no formal education, which in many cases keeps the general farmers from being able to get access to new agricultural technologies. Poor education combined with a relatively young government has led to little agricultural innovations. Chad is known for its cultural diversity and for being a strong-willed country but, without proper education or innovations in plant science Chad is not likely to be able to overcome the hardships, droughts, and other agricultural problems it faces. Chad is just one of the many countries that faces food insecurity, with little of its population actually having an education in new plant science technologies, these new ideas and technologies are not adequately being integrated into the outdated farming techniques of the country.

Food insecurity is the state of being without reliable access to a sufficient quantity of food. Many countries face food insecurity in terrible ways, Chad being one of them. Across the globe "more than 800 million people live everyday with hunger or food insecurity as their constant companion" (Oxford). There are a lot of factors that play into the country's food insecurity including population growth and recent droughts. Not only are there more than 800 million people living in food insecurity worldwide, but 4.7 million people live with hunger in Chad this year. These numbers begin to paint the picture of the hunger stricken country of Chad.

Since Chad is a country where food is not always readily available, a large number of the population does not get enough essential nutrients. "A typical northern dish is esh, cooked millet flour served with a sauce"(Climate). Esh is what the common people of the northern part of the country consume, people in the south eat something different. "In the southern agricultural areas, farmers grow sorghum, millet, and maize. These are ground up into flour to make the main food staple, a thick grainy porridge called boule"(Climate). In neither part of the country does the main food staple offer the correct nutrition to keep people from reaching the point of poverty and undernourishment. Also in years of drought many people don't have much or any food, with droughts becoming more prevalent in the area the food insecurity levels are constantly getting higher.

In Chad there are many cultures with numerous beliefs, and many of them believe in a man having numerous wives and a large number of children. Also, "More than 1/3 of young women are married before the age of 15"(Climate). In many parts of the world under age marriage is frowned upon but in the country of Chad this arrangement is still very prevalent today because of the country's traditional practices In some areas of Chad families will group together to form clans so they are a stronger group of people. In Chad families are often very big with many wives and other relatives. Chad has a very strong background in this tradition.

Chad faces many problems when it comes to food insecurity and one of them is population growth. In recent years the population in Chad has spiked considerably. With over one half of its population under the age of 18, the country has seen the population grow. This has been shown to contribute to the hunger in some areas because there are so many children. This population increase just shows that new innovations in plant science need to come quicker. With more mouths to feed the food insecurity in Chad is becoming more prevalent and could become even more severe.

Chad is a very young country; this year the country will be fifty-five years old. Since 1960 when Chad received its independence there has been many roadblocks in the way to a peaceful country; civil wars and unbalanced government filled the first forty years of the country's life. And now drought and poverty threatens the strength of Chad. The government has also handicapped the large business owners in the country by having extremely high taxes. All the government decisions and recent civil unrest has added to the already growing poverty rates. Also with higher taxes the price of food has gone up. There are several government factors that have led to higher poverty rates.

Drought has been more common and with 80 percent of the country living off of the land this has proven to be detrimental to the economy. Many years families can not make enough to support themselves by farming and herding alone. Since the droughts many villages have become ghost towns because the residents have moved to bigger towns in search of work. "The surplus of labor has had a knock-on effect in urban centres, where wages have dropped by almost a third"(Climate). Having a source of income is very important anywhere, and in Chad the economy is at a state where whatever the people do they cannot seem to get out of the grip of hunger. This has an effect on getting adequate nutrition. Since the price of food is getting higher and the wages are lowering people cannot afford enough food to feed their families. Food prices are higher because of droughts, following the law of supply and demand. The country and people of Chad face many barriers when it comes to the battle with food insecurity.

Since drought has become a common problem and with so much of the country depending upon agriculture as their main source of income this has become harmful to the country's well being. With the economy already suffering from civil unrest, a lack of food is just another situation that has pulled the economy down. But the "Economic growth in Chad... could reach 9% in 2015 due to the start of production in new oil fields"(Boukar). The Chadian government is very dependent upon oil to help the economy stay afloat. The only problem with this oil is that it is not helping food prices lower, which is harmful for many of the average people in Chad. Having the oil fields is helping in providing jobs to the people who have lost their farms due to extreme weather. The oil fields have made a difference in the agricultural standing of the country as well as the economy.

“About 80 percent of the population depend on farming or herding or gathering forest products for a livelihood”(Rural poverty in Chad). In Chad many people rely on farming. Most farms are very small and are family owned, also nomadic people herd animals. The main crops include cotton, dates, millet, sorghum, and maize. Many of the nomadic people herd cattle, sheep, and goats. But most farmers don't know about new farming technologies like genetically modified organisms, GMOs, and commercial fertilizers. With appending droughts farmers have to learn about new technologies so that they can raise their crop yields so that they can stay above the poverty line. Chad is a country that is still using antiquated farming methods.

Compounding the outdated agriculture is Chad's diverse climate regions, it is divided up into three regions: the South, the North, and Central Chad. “Chad has a hot and tropical climate, though temperatures do vary depending on area”(Columbus). This is very important when it comes to Chad's farming regions; the south and central regions are good for farming but the northern region is too hot and gets almost no rain. In the northern region most of the time men just herd cattle and buy their food because of so little rain. In the other two sections of the country rain fed crops can be raised such as millet, cotton, and potatoes. It is very important to know the geography of Chad because each area has a specialized climate and knowing what can be grown in that climate will help farmers.

Plant science is almost nonexistent in Chad. Many of the farms still use the same techniques that generations before them used. “Farming methods are traditionally simple, and irrigation and mechanical equipment are rarely used”(Climate). The people of Chad could really benefit from the innovation in plant science.

In the past few years, plant science has really changed the way most of the world farms by helping us have stronger crops which can withstand droughts and insects, like termites. Plant science innovations like these have sped up productivity while also increasing the amount produced per acre. In Chad most farmers do not know these technologies exist and if they do, the farmers cannot afford to implement them. The missing new technologies directly relate to a small farm's inability to feed a family. Also if some of these techniques were implemented the food grown in Chad would become cheaper and more available for a higher range of the general public to buy.

If the common farmers were taught how to use irrigation and modern farming equipment their crop production per acre would increase even in the years of drought. If the crop were better the food would become cheaper, which means fewer people would go hungry. If this change reaction were to happen ultimately Chad could get back on its feet.

The field of plant science has evolved dramatically and has changed the way people farm all across America. For example, “the first genetically modified soybean was planted in the United States in 1996”(Compass). Now 58 percent of the soybeans produced in the United States are GMO soybeans. These soybeans have a gene in them that confers herbicide resistance, which helps growers to have a higher crop yield. It is easy to see that this type of soybean helps growers with production here in the United States and would make a huge impact in Chad too. Another example of a GM crop is maize which is already grown in Chad. The genetically modified version of maize was first grown in the states in 1997.

“Two traits are expressed by today's maize cultivars: insect resistance and herbicide tolerance”(Compass). In Chad this crop would do great growing there and the citizens would respond greatly to it, because maize is already a Chad crop the people they will probably be accepting. These are just two of the many genetically modified organisms that could be very impactful to the people of Chad.

There have been many new farming devices that have become available to purchase in recent decades. Two products which might benefit the everyday farmers in Chad are the drip irrigation system and the compact tractor. Both of these systems could become effective for the farmers in Chad. The first, drip irrigation, is something that could help by watering the crops when there is no rain. This irrigation system includes bendable tubes which lay on the ground and provide water to the plants directly on the base of them. Many small villages are beside creeks or near bodies of water that they could use as the source for the irrigation system. There are many other types of system which could work but the drip is a very popular system and it has been shown to work efficiently.

Another device which could drastically change the way the people farm is a compact tractor. Compact tractors are not very big, but fittingly almost all of the farms in Chad are not much larger than one acre. Most times if the farmers plow their fields it is either by hand or with a oxen, having the use of a tractor would not only make the workload smaller it would lessen the time it took to plow the field. There is a huge draw back to the tractor though, tractors cost quite a bit more than manual labor or even an oxen and plow. A way to overcome the price is by buying it as a village. This seems possible because most of the villages in Chad already work together to plant their crops since no one wants to see their neighbors starve. By making this joint purchase not only would one family benefit from the tractor but the whole village would get to reap the benefits.

The people in Chad have faced many barriers, including the agricultural one. The agricultural barrier would include little education when it comes to plant science. When learning the new plant science technologies they would be able to strengthen their crop yields and make more money per acre, even in the near future small steps towards new farming techniques will help the people of Chad. Not only would they be able to heighten their productivity, with GMOs they could plant better crops which will give them a better chance at harvest even in years with little rain or when termites invade their field. Sadly, a large number of these new plant science technologies are not yet being used in Chad.

Education is scarce in Chad, many tribal farmers never go to school. “Only around three-quarters of students are enrolled in school”(Climate). The government tries to enforce school attendance but in Chad school cost money and many can not afford to go. Also most girls never finish school because they get married. A large number of the farmers in Chad and in Africa in general are women because the men go out and get other small jobs while the women care for the homestead. Since the schooling women do get is so little they are never informed of the new technologies that could help them harvest a higher crop rate, like GMOs and irrigation. Having adequate medical attention is very important. In Chad healthcare is very scarce there is only about .4 doctors for every 10,000 citizens(Climate). In 2010 there were only 325 health officials in the entire country(Climate). Being a developing country large numbers of children catch deadly diseases like HIV and malaria, “20 percent of children do not live to see their fifth birthday”(WHO). Chad has very inefficient medical care. Healthcare and education improvement is a necessary step for Chad to take towards a stronger country.

“Education is the key to unlock the golden door of freedom,” as George Washington Carver said. The golden door of freedom that could be unlocked in Chad is educating the population so no one ever has to feel the pain of hunger again. Addressing the ongoing lack of knowledge of plant science in Chad would help solve the problem of food insecurity. To fill the knowledge gap concerning plant science, people can go to local villages and farms and teach the farmers how to implement basic technologies like irrigation. After those farmers learn they can teach other farmers and villages how to use the technologies. Using this strategy would help the information get to more people faster.

In Chad there is already a program to help with agricultural development called the International Relief and Development program, IRD. “In June 2005, IRD launched the emergency Food-For-Work and Agricultural Assistance for Affected Villages in Eastern Chad”(Success). The program is set up in mainly eastern Chad but if it were up scaled to the entire country it could help end the threat of food insecurity, other parts of the country including the south would benefit from the expansion of this program. Not only does the IRD teach farmers how to use irrigation and build better wells they also provide food to the hungry villagers during the training period. If the IRD, or programs like it, were to expand to the entire country the improvements would be startling. This organization does not only feed the people it also helps them feed themselves in coming years. With this the families that are affected by the program can teach their children how to use these technologies so that generations to come can be self sufficient. With new irrigation systems and plant science ideas, Chad could become better equipped to feed its population, by producing higher crop yields.

Another way that agriculture education is being taught in Chad is in classes. In Moundou, the second largest city in Chad, there is a college course being taught to about 400 students. The course is for teaching students about agricultural technologies. The agricultural class is in a building that is especially made to teach agriculture. This is a great way to get the word out about new agriculture technologies. Also there are many programs in Chad that offer scholarships to the students. This is very important to the well being of the country because when you are educated it is easier to find new information on agricultural advancements. In Chad school tuition is not free and a program called Good Neighbors, “is currently supporting the tuition of 70 percent of the students”(Mandalia). The place where Good Neighbors has provided so much free tuition is in Mandalia, a poverty stricken area. Education can ease many of the problems in Chad.

The best organization for Chad would include not only feeding the people but also teaching them how to feed themselves. Of course it would include feeding the people because it is hard to focus while hungry. It would also include educating on the bases of agriculture and general education as well. There are already organizations that are giving away scholarships but not to all children, so many children go without a complete education. The organization would also go out to villages and teach the adults agriculture technologies and plant science so that they can integrate it into their everyday farming, and hopefully create higher crop yields. When teaching the people about the new technologies we would include the building of wells, irrigation systems; and the use of GMO and commercial fertilizers. It would also include the entire country not little areas. Chad is in a state of dire need and without helping the whole country the problem will never really be fixed. Education is a powerful thing; education can change your life forever. Having the education in plant science could make a huge difference for the people of the

small African country. I feel as if the perfect organization for this country is a combination of both education and plant science. Education can change Chad.

In the past years agriculture has changed drastically in America through GMOs, sophisticated tractors, and many more advancements. But for other countries technology advancements have not yet reached them, Chad included. In America in 1960 a farmer fed an average of 25.8 people but now a farmer feeds 155 people on average. This number has gone up over the years and will hopefully keep going up thanks to new innovations in plant science, but for Chad the number each farmer feeds is going down due to drought and lack of education. This problem can be changed through using the advancements other places are already implementing. If Chad were to use these technologies their average crop yield would improve. Plant science could help the people of Chad.

Chad is a beautiful country, but has a high poverty rate which has led to food insecurity. This year 4.7 million out of the 12 million total population were undernourished. Chad has traditional farming methods which are just not cutting it when it comes to producing enough food for the population. Since the sixties when Chad became a free nation it has faced many hardships; civil wars, government unrest, and economic trouble. As a country Chad has many disadvantages; it is landlocked and is geographically very small. Yet the people of Chad continue to fight to get their nation back on its feet.

Chad, a country that the public may see as hopeless, is really a country filled with loving people who will help their neighbors even when they do not have much more themselves. Chad has huge stores of oil and has high production rates for cotton and dates. But due to government and economy struggles and a challenging climate the country could not export an adequate amount. The people in Chad hardly ever go to school and those who do will often not finish. The education barrier has a detrimental effect on trying to teach agriculture to the general public. Without these new technologies, it will be hard for the people of Chad to make it out of the grips of poverty, and become an agriculturally sound country.

Chad's flag is made up of three horizontal stripes going in order: blue, yellow, red. The blue is for the French since they used to be a French colony, with the yellow and red the pan-african colors. The blue also symbolizes hope. Yellow symbolizes the beautiful sun which is almost always shining over Chad. And red symbolizes progress, unity, and sacrifice. When you think of all that this small country has been through in its young life their flag also represents their transformation. Blue for the women who plant another field in hopes of a crop just big enough to survive. Yellow for the sun which beats down on the man who leads his cattle to sale. And red for the parents who sacrifice everything so that their children can have the education they never got to have. This country is full of hope. If they could just have the tools they needed to succeed, the country could thrive. Chad has survived through the years of wars, droughts, and government take overs. Chad is a great country with many things to offer, but it needs some help to get it out of poverty and food insecurity. Through plant science and education Chad could become a much stronger country and even contribute to the world economy.

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