

Eric Stollenwerk Cedar Creek
High School Egg Harbor City,
NJ, USA Nigeria, Sustainable
Agriculture

Nigeria- Increasing Production of Small Family Farms

How do the topics of sustainable agriculture, food security, and Nigeria collide? Well, that is simply because most Nigerian families in rural areas rely on their small 0.5-hectare farm to supplement and or supply their food. These small farms are showing themselves to be ineffective at staving off hunger in Nigeria. Statistics show that 11.5% of Nigeria's population was hungry in 2016 and that was a 2.5% increase from the previous year. The year 2015 showed an increase of 1.2% showing that hunger is becoming a growing problem in Nigeria each year (Nigeria Hunger Statistics). Two other issues contribute to the rising food insecurity in Nigeria, one of these issues is the gender inequality that is embedded in their culture. A majority of Nigerian farmers are women but they are not given access to the same equipment or rights as a male farmer, reducing the country's overall production of crops. Conflict is also prevalent throughout Nigeria and this forces many to leave their land to find safety or peace. The conflict is trifold, to the north-east, there is the Boko Haram Islam Insurgence, discontent and militarism in the Niger Delta, violence between herders and farmers from the central valley southward and final separatist Biafra in the Igbo south-east. These conflicts occur over the region's with the best arable land (Nigeria Crisis Group).

Nigeria is located along the equatorial coast of Africa. It is the 14th largest country in Africa with a landmass of 923,768 square kilometers. It is bordered by the Republics of Chad and Niger to the north and the Republic of Benin to its west (Encyclopedia Britannica). The Country has 800 km of coastline as well as plains and plateaus to the north which are interrupted by hills in the center of the country (Nigeria Geographical Information). A majority of these plains, plateaus, and hills are covered in a tropical savanna with smaller parts covered in tropical rainforest, causing the country to have a mostly semi-arid climate (Nigeria Climate Data). Living within the country are 202 million people (Nigeria Population (LIVE)), 50.3 % of whom live in an urban environment while the other 49.6% live in a rural area (Rural population (% of total population)). These 202 million people live under a federal presidential republic led by the current president, Muhammadu Buhari (Nigeria: Government). While Nigeria's main exports used to be agriculturally based it has recently changed to the extraction and exportation of crude oil and other petroleum products. As crops became less valuable for their citizens, residents choose to cultivate and produce fewer crops. The country now has to import agricultural products (Nigerian Economy) to feed its residents despite having 30-33 million hectares of arable land under cultivation (Nigeria - AgricultureNigeria).

The average Nigerian family consists of 3-5 people (Household Size and Composition Around the

World). In the urban areas of Nigerian families live in townhouses, bungalows, and apartments, while in the rural areas families can be found living in more traditional houses made of clay, mud and palm fronds (Types of houses in Nigeria). Most families own a small farm of 0.5 hectares or less, for size reference that is about half the grass area of a track and field (Food and Agricultural Organizations of the United Nations). These farms are used to grow Cassava, yam, cocoyam, and Maize to supplement or provide

food for a family. (Nigerian Traditional Food System and Nutritional Food Security) These farms are dependent on rainfall as only 9% of Nigerians farms are irrigated (Nigeria: Food Security Portal). Nigerian families also get the rest of their supplies and food from local open-air markets, about 73% of families shop here. The shops have to be local because 45% of Nigerians do not own a car and only 42% of them own a refrigerator or freezer making shopping every day necessary (Nigeria's Middle Class). Out of all the Nigerian families, 90% of them do not have access to healthcare (Health care in Nigeria). 8.73 million children did not participate in education (Education in Nigeria). One in three people in Nigeria does not have access to clean water, which is about 59 million. Also, seven in ten people don't have access to toilets, which is about 123 million (Water Aid). 54.4% of the population has access to electricity (Access to electricity). Employment is also an issue within Nigeria as only 76% of Nigerians are employed as either farmers, oil workers, fishermen or unskilled labor (Trade Economics). Even travel is not easy for the average Nigerian as there are about 120,546 miles of road that are poorly maintained throughout the country (Quality of Roads in Nigeria).

This idea of food security affects different people differently. Women, men, children, elderly and even minorities like immigrants or refugees are all affected differently. Food insecurity affects women differently from men because they do not have the same access to the tools and finance that men have, hampering their ability to farm efficiently and grow enough to feed themselves. Children have to work the farms and miss out on education opportunities that could allow themselves to better themselves or even learn better farming practices. Refugees, about three million, are one of the minorities most plagued by food security because they are always moving and lost almost everything due to conflict (Food Assistance Fact Sheet). They are completely reliant on the goodwill of the people and the government, and if the people can not feed themselves they will not feed the Refugees.

So how can one in Nigeria get the most out of their farm and, by extension, stop or slow the hunger rate and support the influx of refugees that now reside in the country? A simple solution made very difficult by the culture is the elevation of women to give them access to better farming techniques and access to their land, as Nigerian women constitute about 70-80% of all agricultural labor. Farm owning women in Nigeria have only a 14% claim to their land and are limited in the purchasing and owning land (Women Lead Agriculture In Nigeria). Their access to farm training and advice, crop and technology insurance and credit all reduce the output of their land (Women Lead Agriculture In Nigeria). These women are not farming for a profit either, they are subsistence farming for themselves and their family. If women had the same access to farming rights and opportunities as men it is estimated that Nigeria would experience a 20-30% increase in their farm's production (Project, B). The issues that lie within this solution are cultural as well as economic. Women in Nigeria are seen as people to be wives and dedicate their lives to their

husbands. They are meant to work in the house, cooking, cleaning and taking care of the children. This has been the way as Nigeria has always been a male-dominated society, it is thought that even the poorest man is above every woman. This idea that women are subordinate comes from not only culture and tradition but stems from their religious practices in Nigeria. (Conditions of Women in Nigeria). But this issue is being combated by a coalition of women called WARDC or Women Advocates Research and Documentation Center and loose groups of organized women farmers, all pleading with the government and local powers for things to change. To garner support from the people for this task these organizations could use things such as posters, radio broadcasts and even television to reach out to the people in the country and possibly inspire those to take a stand or support the cause. Posters and flyers would probably be the most effective in high traffic areas such as the local open air markets that many families visit on a regular/daily basis as well as the fact that many Nigerian's might not have access to radio or other electronic devices with only about 54% of their population having access to electricity (Access to Electricity). It would be a tough change, one that has to fight against years of culture but the benefits to doing so would be invaluable. Not only increases the food quality and production of Nigeria but increases its citizens quality of life, economic status, and privilege of an oppressed group.

A final issue with this solution is that Nigeria has an overburdened education system and adding women into that system could stretch the system even further. Overburdened despite the fact that many Nigerian's still do not participate in the education given. There are ways to combat this issue as there are many organizations that are willing to provide funds or assistance to the education of women such as the National Coalition for Women and Girls in Education (NCWGE).

Since many Nigerians own and operate farms to feed their families environmental impacts tend to occur. These are small family farms that are cultivated to provide for the farmer's family so their practices tend to be fairly intensive. They also lack the resources to introduce nutrients back into the soil through the way of fertilizers and other such things, so preservation of their farm's soils is paramount. There are many easy to implement practices that are effective in keeping soil grounded and healthy. One very simple method is called cover cropping or using fast and close-growing plants to protect and hold the soil down during rain or wind, typically legumes are used in this capacity. This mat of plants can stop erosion, which is an issue in Nigeria as a study found that around Ibadan, Nigeria's capital, that 3.3 hectares have been eroded from plots that only grow maize and 1.8 hectares eroded from plots with cover crop (Soil Conservation In Nigeria). Cover crops not only stop erosion but improve the soil quality in which they are grown. Cover crops and improve infiltration rate, moisture content and introduce more nitrogen and organic matter into the soil improving crop yield. It was found that the plant, *P. phaseoloides*, fixed about 84-202 kilograms of Nitrogen per hectare in about 18 months. This resulted in a higher crop yield of maize at 2.5 hectares than the control without legumes resulting in 1.3 hectares (Soil Conservation In Nigeria). Cover crops also work as natural weed control, out competing and overgrowing weeds that would consume resources in the soil. Nigeria already has access to cover crops that act as excellent weed control and these plants are known as witchweed and speargrass (Soil Conservation in Nigeria). There are issues with the use of cover crops as they can end up in competition with food crops, but this minor issue can be dealt with by either selecting crops that are compatible or cutting back and managing the growth of the cover crops. And the extra hassle of having to deal with natural cover crops outweighs the benefits of

using another easier to manage, but non-native, cover crop that has the possibility become invasive. It is also cheaper and more cost effective to work with what is on hand rather than importing other options.

A final way to increase the production of the Nigerian food supply is the expansion of farmland. Nigeria currently has about 30-33 million hectares of which falls short of the estimated 78 million hectares of land needed to produce enough food for the country. (Nigeria - AgricultureNigeria). But to increase the size of a farm a person can operate they have to be aided with technology or more manpower.

Technology can drastically increase the amount of land a person can cultivate. An example of this is that in the United States an average farm size is about 400-450 acres or 161-182 hectares. (Farm and Land in Farms). Not all technology has to be state of the art either, the people in Nigeria do not have the means nor the need for a tractor trailer, simple irrigation could drastically increase the amount of land Nigerians could cultivate successfully. What is meant by “technology for Nigeria” is simple but effective methods that have been found, not drone operated tractors or satellite imaging. Because currently, only seven percent of Nigerian farms are irrigated, and because of this fact local farmer’s growing seasons are held to the rainy season and not able to be extended for a longer window of cultivation. It is estimated that one million hectares in Nigeria are eligible for irrigation, and with this irrigation, it is predicted to bring about 600 million dollars increased income for farmers in the dry season alone (Cultivating Growth In Nigeria Through Small Scale Irrigation). The implementation also allows farmers to have access to more land during the rainy season as well. The process of irrigating the land does not have to be complex either. Simple trenches dug in the ground that divert river water would suffice. Or even channels carved into the ground that could collect, direct and transport rainwater. This reduces the cost of irrigation drastically and makes it easier to maintain than drip irrigation, which while more efficient is costly and difficult to maintain. The end result will be the same which is increasing water flow throughout those farms which extends and enhances their growing seasons having a positive effect on crop production.

Another solution to increase farm size for increased production of food is the use of more manpower. Nigeria has a large and rapidly growing population with an increase of 2.5% every year (Annual Population Growth), with this growth people will need jobs and employment to earn money to support their family. As well as the fact that Nigeria already has a large amount of untapped manpower with current unemployment of 24%. (Trade Economics). Farming is a great occupation for these people, not only will it give them employment to earn a wage, but it will provide food for their family and lower their expenses in the long run. With an increased farmer population more land will come under cultivation and creep slowly towards the estimated 78 million hectares needed to sustain the country.

Nigeria has been in the grips of hunger and food insecurity for too long. The hope is that with these proposed solutions inspiration can be drawn and methods made to fix the hunger and strife within the country. Without a sustainable and secure food source, a country can not grow. Its people can not flourish or advance themselves and their fellow man for the greater good. Food is at the heart of our civilization and if it is not civilization becomes weak then teeters and collapses. Let us save Nigeria from this fate.

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