



ACHIEVING FOOD SECURITY IN NIGERIA: CHALLENGES AND STRATEGIES

Lead Paper presented by

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PREAMBLE

It is indeed a great pleasure for me to be invited to participate in this August conference of the Society for Community and Communication Development Research (SCCDR) and to play the role of lead paper presenter. Permit me therefore to sincerely thank the organizers of this conference for finding me worthy to serve as a keynote speaker. The theme of your conference 'Rural insecurity and sustainable food production in Nigeria is very appropriate to the present situation in Nigeria'. Nigeria's population of over 180 million people is projected to reach 230 million by 2030 and 430 million in 2050. For a country that is currently food insecure to a large extent, feeding an increasing population is a major challenge. It is therefore commendable at this point to raise discussions on food security challenges. Agriculture in Nigeria has remained the largest non-oil contributor to the national economy and employing almost 70% of the national work force. The major players in this sector of the economy are smallholder farmers who inhabit the rural areas. Consequently, it is very apt and timely to examine relationships between rural insecurity and ensuring the food insecurity of an increasing population.

INTRODUCTION

Achieving food security is the first step in achieving security in any nation. The World Food Summit of 1996 defined food security as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life". According to the Food and Agriculture Organization (FAO), food security exists "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". The Africa Bureau of the United States Agency for International Development (USAID) defines it as a situation when everyone has physical, social, and economic access to sufficient food to meet their dietary needs, produce, and stay healthy. The World Bank defined it as a condition where everyone has access to sufficient food to live a healthy and productive life. Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. These definitions have some key words namely, *availability, access, utilization, stability and food preference* that need further explanations.

Dimensions and Indicators of Food Security

Food availability considers food production in a given area and the capacity to bring in food from elsewhere, through trade or aid. In measuring food availability, consideration is given to indicators like average value of food production, dietary energy

supply of available food, dietary energy supply from cereals, roots and tubers, protein supply of the available food as well as the average protein supply from animal origin.

Food access refers to economic, social and physical access to food by all people at all times. It exist when People are able to regularly acquire adequate quantities of food, through purchase, home production, barter, gifts, borrowing or food aid. Indicators of food access include rail line density, Purchasing power, prevalence of undernourishment, prevalence of total food insecurity in the total population and prevalence of moderate to severe food insecurity in the total population.

Food utilization: Consumed food must have a positive nutritional impact on people. It entails cooking, storage and hygiene practices, individuals' health, water and sanitation, feeding and sharing practices within the household. The indicators of food utilization include the following – percentage of population using basic drinking water services, basic sanitation services, safely managed drinking water services, and safely managed sanitation services; percentage of children under 5 years of age who are stunted, overweight or affected by wasting; prevalence of obesity in adults, prevalence of anemia in women of reproductive age, prevalence of low birth weight and prevalence of exclusive breast feeding among infants of 0 – 5 months of age.

Food Stability refers to the stability of food



availability, accessibility and utilization over time. In terms of measurements, its indicators are cereal import dependency ratio, percentage of arable land equipped with irrigation, value of food imports relative to total export, political stability and absence of violence/terrorism, per capita food production variability and per capita food supply variability. According to Matemilola and Elegbede (2017), these four components of food security (availability, access, utilization and stability) must be satisfied simultaneously to meet the objectives of food security.

Perspectives on food security

According to FAO, in 2016 the number of chronically undernourished people in the world is estimated to have increased to 815 million, up from 777 million in 2015 although still down from about 900 million in 2000. The State of Food Security and Nutrition in the World estimated that the number of undernourished people was 821 million in 2017 and 820 million people did not have enough to eat in 2018. Nearly 151 million children under five are affected by stunting in 2017. Adult obesity is worsening and more than one in eight adults in the world is obese. Key findings of the 2018 State of Food Security and Nutrition in the World indicate that [1] a rise in world hunger, an important warning that we are not on track to eradicate hunger by 2030 [2] decline in child under nutrition, but increase in levels of adult obesity and anaemia in women of reproductive age [3] climate variability and exposure to climate extremes are threatening to erode and reverse gains made in ending hunger and malnutrition

Global food supply varies depending on physical and human factors. Consequently, some countries produce more food than others. For the same reason, some nations are net food exporters while others are net food importers. Some factors that define differential food production in the world include:

[a] Climate – Agriculture is weather dependent. Global warming is increasing temperatures by around 0.2°C every 10 years. Rainfall is increasing in some places, but decreasing in others. Higher temperatures and unreliable rainfall make farming difficult, unpredictable and unprofitable. When drought occurs, less food become available and food prices increase, leaving poor people vulnerable.

[b] Technology - improvements in technology have increased the amount of food available. Technology can overcome temperature, water and nutrient deficiencies in the form of greenhouses, irrigation and fertilizers. Today's agriculture routinely uses

sophisticated technologies such as robots, temperature and moisture sensors, aerial images, and GPS technology. These advanced devices and precision agriculture and robotic systems allow businesses to be more profitable, efficient, safer, and more environmentally friendly. The benefits of these technological tools include higher crop productivity, decreased use of water, fertilizer, and pesticides, which in turn keeps food prices down, reduced impact on natural ecosystems, less runoff of chemicals into rivers and groundwater and increased worker safety. Improvements in farm-based technologies, infrastructure, warehousing facilities, as are required to achieve the Malabo Declaration to halve food waste in Africa (Economic Commission for Africa, 2018).

[c] Loss of farmland - Gully erosion and desertification are taking so much land that could be profitably used for agricultural production. The growth of the biofuel market is taking up valuable farmland which is then not used for food.

[d] Pests and diseases - Farmers in advanced countries use pesticides and have increased crop yields, whereas most farmers in developing countries cannot afford them. Thus, crop losses due to crop pests and diseases are a major challenge to local food production in most developing countries.

[e] Water stress - irrigation systems provide water for countries with unreliable or low rainfall to boost agricultural production. Countries that manage their irrigation systems properly produce more food than they require locally and even export.

[f] Conflict – Violent conflict forces farmers to abandon their farms and flee from their land. Food can be used as a weapon, with enemies cutting off food supplies in order to gain ground.

[g] Poverty - when people are poor and have less money, they cannot afford food and they become unable to work. The energy to work comes from the food that people eat. When the workforce is poor and hungry, their productivity is significantly reduced.

In Nigeria, about 7.1 million people are facing acute food insecurity and in need of urgent lifesaving and livelihood protection (FAO 2017). A recent joint stakeholders' report on the food insecurity situation in 16 states in Northern Nigeria indicated that over 3.7 million people are food insecure (<http://blogs.iita.org/index.php/pressing-challenges-to-food-security-in-nigeria-and-ways-forward/> accessed 25. 07. 2019.)

Challenges of food Security in Nigeria

[a] Violent conflict – According to Nigerian food



security outlook update of April 2019, Since Boko Haram attacks escalated in 2009, hundreds of civilians have been killed with thousands of households in Nigeria displaced and their farmlands and livelihoods completely destroyed. An estimated 1.8 million people remain displaced in Lake Chad

area due to persistent conflict. The loss of agricultural production due to Boko Haram's activities is estimated at US\$3.5 billion; the total economic impact of the insurgency has been put at US\$9 billion.

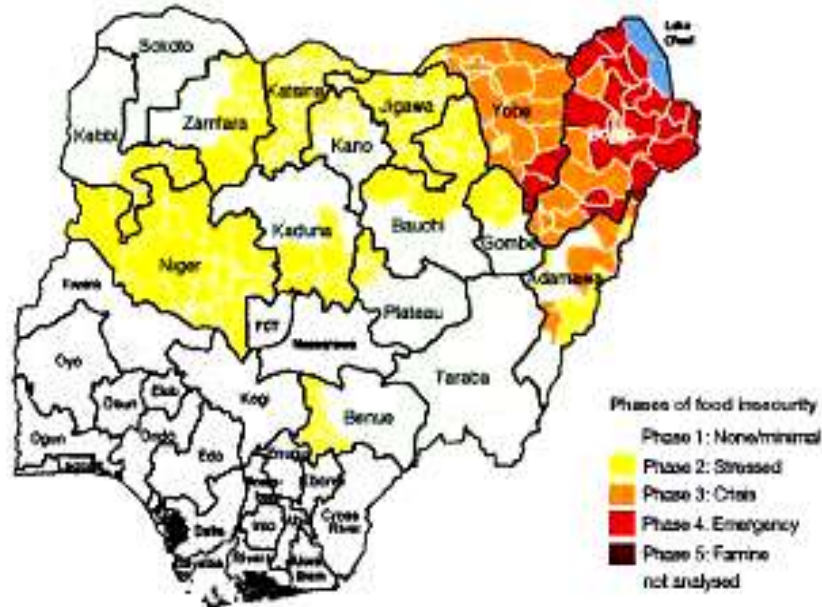


Figure 1. Food insecurity as influenced by Boko Haram (July – August 2017)

Coupled with Boko Haram insurgency is the increasing clashes between farmers and herdsmen as well as terror unleashed by armed bandits. These new dimensions of insecurity are affecting most parts of the middle belt and spreading southwards. Farmers are now afraid to go to the farm for fear of molestation by herdsmen. Sometimes, cattle graze on the crops, wasting the efforts and resources of the crop farmers. The increasing violent clashes between herdsmen and farmers have resulted in deaths, displacement of people and causing disruptions in agricultural activities. The crisis has destabilized food production with a negative impact on food security in Nigeria. Figure 2 below shows that in Benue State, the food basket of the nation, the clash between armed herdsmen and farmers affected 19 of the 23 Local Government Areas of the State. The areas in red are directly affected while the areas in yellow are indirectly affected. What is certain is that food security cannot be ensured when farmers are killed, crops destroyed, and farming communities displaced.

Armed bandits have made movement within the country a nightmare. They rob, kidnap and even kill innocent travellers many who engage in marketing of food. The implication is that food prices will increase and poor people will become more food insecure.

[b] Climate Change and Natural Disasters

Agriculture in Nigeria is dependent on weather conditions and thus faces risks associated with climate variability and change such as rising temperatures and changing rainfall patterns. Analysis of long-term meteorological data in Nigeria has provided empirical evidence of climate change (NIMET, 2008). As shown in figures 2 and 3 below, the country currently experiences late onset and early cessation of rainfall. Unpredictable changes in the onset and cessation of rainfall leads to crop failure. High mean temperatures favour pest development and frequency of disease outbreak. Warming trends make storage of roots, tuber crops and vegetables more difficult. Increasing natural disasters are reducing the quality of agricultural resources. Extreme weather events like thunderstorms, heavy winds, and floods can devastate farmlands, leading to crop failure.

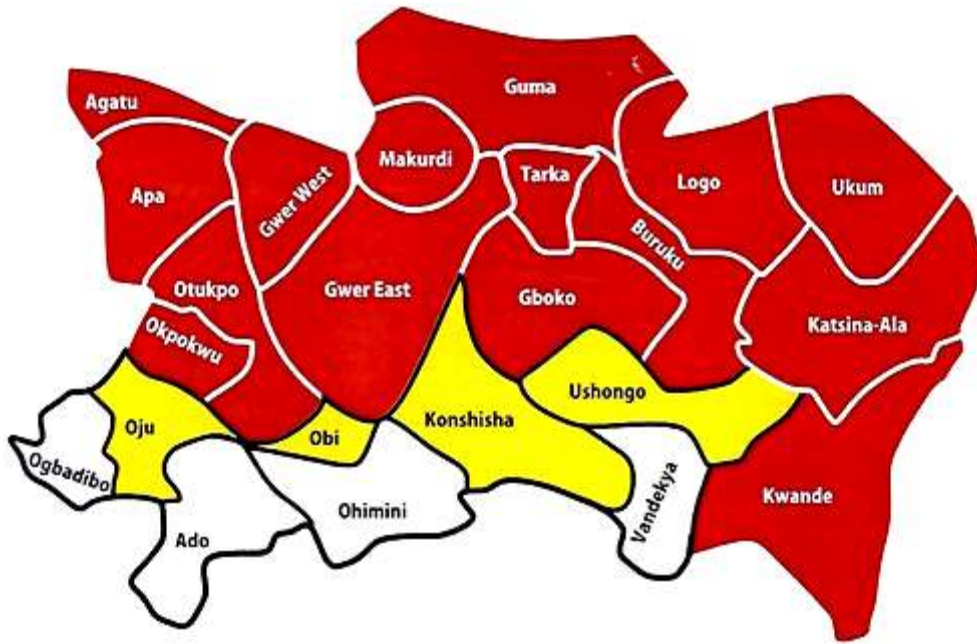


Figure 2: Map of Benue State showing areas affected by clashes between farmers and herdsmen

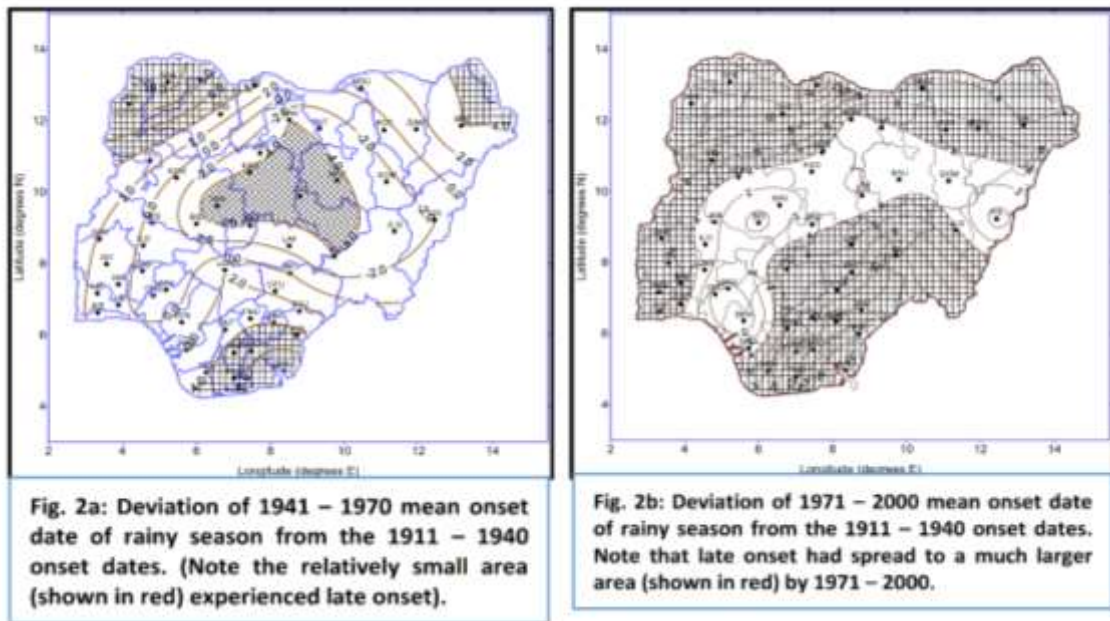




Fig. 3a: Deviation of 1941-1970 mean cessation date of rainy season from the 1911-1940 cessation dates. (Note the relatively small area of the country (shown in red) experienced early cessation of rainfall.

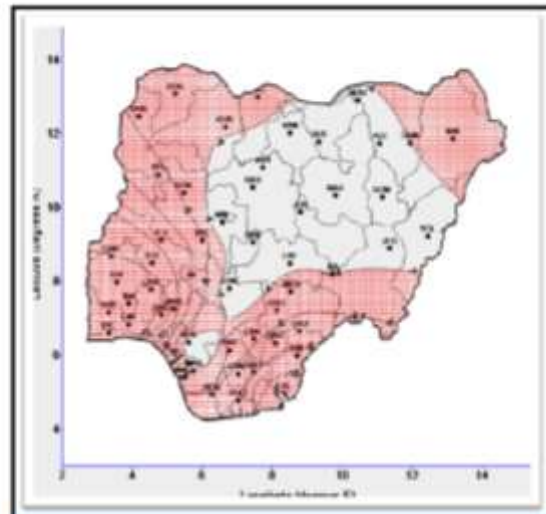


Fig. 3b: Deviation of 1971-2000 mean cessation date of rainy season from the 1911-1940 cessation dates. Note that early cessation had spread to a much larger area (shown in red) by 1971 – 2000.

Climate variability and change affects growing crops as shown in figure 4 as well as the natural resource base for agricultural production as shown in figure 5. Natural events – like flooding, desertification, drought and erosion – have contributed to poor conditions for agriculture, land

degradation and overall decline in agricultural productivity (<https://reliefweb.int/report/nigeria/five-point-plan-make-buhari-s-council-food-security-success>) accessed 25.07.2019.



Figure 4. Flooded Cocoyam farm in Imo State and Sorghum farm in Sokoto State



Figure 5: Gully Erosion sites in Ohafia area of Abia State

[c] Low technology for production, processing and storage

Agricultural production and processing activities in Nigeria are characterized by low technological inputs. Field operations in crop production as well as processing of food crops are executed with traditional farm tools powered by human energy. Consequently, drudgery associated with food production and processing is so discouraging that young people avoid agricultural related activities. Consequently, limited quantities of food are produced with human labour. Also, because of lack of technological tools and machines, little fraction of what is produced can be processed or stored. Agricultural chemicals like fertilizers and pesticides are not readily available and frequently too expensive for resource poor farmers. All these combine to hinder food production.

[d] Reduced production and increased food waste

Between 2008 and 2013, production of staple cereal foods (maize, millet, rice, sorghum, wheat, and other cereals) declined by 11.8% from about 28.8 million tons to about 25.4 million tons. Also, spice (pimento and other spices) and tomato production shrank by 1.7% and 14.1%, respectively over the same period. Small-scale farmers – with less than two hectares under cropping – produce about 90% of the food in Nigeria. Unless they employ sustainable farming practices to protect land, water, soil and genetic resources or precision farming practices, which would make them more resilient to the natural events, small-scale farmers will not be able to produce enough food to feed their families or meet public demands (<https://reliefweb.int/report/nigeria/five-point-plan-make-buhari-s-council-food-security-success>) accessed 25.07.2019. In addition to reduced production of food arising from violent conflicts and climate change hazards, a large quantity of the produced food is wasted because of processing and storage facilities. At harvest time, there is surplus

food and what cannot be consumed is very often wasted. Also, a large proportion of the food produced in the year is wasted because of very bad roads, poor storage facilities and other necessary infrastructural facilities. About 30 to 40% of food produced in Nigeria (estimated at about US\$8.9 billion annually) is wasted because of poor preservation capacity.

[e] Access to finance and insurance

Unattractive agricultural financing mechanisms limit enterprising initiatives along the agricultural value chains. A recent report by the National Bureau of Statistics (NBS) indicated that the agricultural sector received only 3% of total bank credit allocation in the third quarter of 2017. This low level of credit allocation cannot encourage agricultural production, processing and marketing. Furthermore, the risks and uncertainties in weather dependent agricultural activities make it imperative for functional agricultural insurance to be in place to support food security programmes.

Strategies for achieving food security in Nigeria

[a] Eliminate Insecurity

Dealing with insecurity in Nigeria is crucial to achieving food security. It requires strong political will. There is no need for herdsmen and crop farmers to clash or fight. The globally known best practice in animal production is ranching. Countries that practice it have no conflict between crop and livestock farmers. Nations that derive huge incomes from animal product, all practice ranching. That is what Nigeria needs to do to end the conflict between cattle herdsmen and crop farmers. Similarly, what is needed to deal with Boko Haram or armed bandits is political courage.

[b] Proper Use of agrochemicals

Proper use of fertilizer entails the choice of the right fertilizer type, right fertilizer rate, right time of fertilizer application and right placement of



fertilizer. When efficiently utilized, yield could be sustained by lesser quantity of fertilizer. With proper use of pesticides, pests and diseases of crops can be effectively controlled. The options of botanical pesticides with proven efficacy in crop pest and disease control should be promoted because of the emphasis on food safety. Proper use of fertilizers and other pesticide reduces negative environmental impacts on the ecology, improving natural resource base for agricultural production and increases food production.

[c] Closing yield gaps

In Nigeria, the potential yield of improved crop varieties is hardly attained. Very often, actual yield is less than 50% of the potential. Closing the gap between what is being produced and what could be produced would yield more food to feed the people as well as reduce the need to clear land for agriculture.

S/N	Crop	Potential Yield tons/ha	Actual Yield tons/ha	Gap
1	Cassava	48	14.02	33.98
2	Yam	19	13.90	5.1
3	Cocoyam	17.5	6.90	10.6
4	Potato	22.5	4.54	17.96
5	Sweet Potato	27.5	3.04	24.46

Source: Mbanasor and Nto, 2017

[d] Adaptation to climate change

Improving irrigation systems and planting crops that use less water would be an effective way to manage water scarcity in agricultural production. In the semi-arid parts of Nigeria, soil water conservation is a necessary and recommended practice to boost crop production. Also, early maturing crop varieties will be preferred in such environment. In areas with so much rainfall, selection of water loving crops is also a recommended practice. Thus, it is important to consider production ecology and implement appropriate crop management practices to increase production. Early warning systems can help farmers to adapt to the negative impacts of climate change.

[e] Increase Agricultural Technology for production, processing and storage

To promote food security in Nigeria, technology device employed must be appropriate. To be appropriate, such technological tools must be within the economic capacity of majority of the farmers to acquire. Such technologies must also be within local technical capacity to maintain. In the search for appropriate technology for food production in Nigeria, smallholder farmers who constitute over 90% of the farmers should be the focus. In a previous presentation, Figure 5 below was used to illustrate what is meant by appropriate technology. The three mowers below can do the same job but their costs and maintenance requirements are not the same. Figure 6 shows an applicator for fertilizer deep placement IFDC is promoting for smallholder rice farmers. It is a good example of an appropriate technology for smallholder farmers.

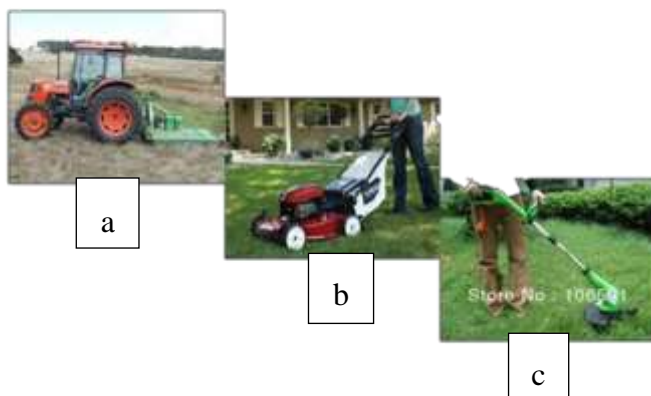


Figure 5: Appropriate technology illustrated.



Figure 6: Fertilizer applicator for smallholder farmers



It is possible to develop similar technologies for processing and storage to reduce food waste. In Nigeria, farmers within a region plant similar crops, they plant at the same time and harvest at the same time. Consequently, supply exceeds demand at harvest time and what cannot be immediately consumed is wasted. About 30 – 50% of food production is wasted annually due to inadequate storage facility and inefficient preparation method. Reducing the quantity of food wasted can yield food to substantially mitigate hunger.

[f] Improve Access to Agricultural finance and Insurance

Agricultural finance mechanisms should be made attractive to promote food security. There should be a deliberate policy to increase the amount of loan made available to farmers. The interest rate and period of loan re-payment should be attractive to encourage majority of the farmers to access loans. Part of the agricultural finance mechanism should target reducing the burden of high risks and uncertainties on farmers through a functional and farmer friendly agricultural insurance scheme.

Ensuring food security will require the integration of many strategies. According to Matemilola and Elegbede (2017), strategies for achieving food security in Nigeria will necessarily integrate economic strategies, social strategies, environmental strategies and technological strategies.

Universities of Agriculture and Food Security in Nigeria

In thinking about the topic of this discuss, one question that occurred to me was ‘what is the role of Universities of Agriculture in the search for food security in Nigeria? Indeed, Universities of Agriculture were set up to catalyze the agricultural sector of the economy and ensure food security. With regard to the issue of this discuss, there are some refinements that will enable the Universities of Agriculture realize their visions more easily. In another article (Asawalam 2018), I discussed the expectations on Universities of Agriculture to include development of tools and techniques, improvement of food crops and farm animals, development of soil resources management, crop production and protection techniques, facilitation of adoption and diffusion of agricultural technologies and value addition to crop and animal products. To eliminate drudgery in agriculture and encourage young people to take active part in agricultural production and processing, human energy must be replaced with machines. In this regard, Engineers in Universities of Agriculture should accept the challenge of developing tools and machines that replace human energy in the production, processing and storage of stable food crops. It will require

spending time to properly understand the dynamic soil properties, cropping systems, field practices, nature of farm produce after harvest and the needs for processing, storage and distribution. Over time, incremental improvements on a prototype will eventually give rise to improved tools that efficiently and effectively promote production, processing and storage of agricultural produce.

In addition to development of technological tools and machines, scientists and researchers in Universities of agriculture are expected to innovatively find solutions to agricultural problems irrespective of their areas of specialization. To illustrate this point, listen to this story. When Professor Ikenna Onyido, a physical Organic chemist, moved from University of Ibadan to University of Agriculture Makurdi, he developed a program on Agrochemical Technology to make himself relevant to the University of Agriculture. In the same way, other scientists working in Universities of agriculture can tailor their research to solving agricultural problems. Doing this will greatly increase the quantum of research in our Universities of Agriculture. Researchers in Universities of Agriculture, who are yet to understand clearly how their knowledge and skills can contribute to improvement in agricultural knowledge and skills are in the wrong place and cannot contribute to the attainment of the vision of their Universities.

CONCLUDING

Food and nutrition security is an issue of global importance, and is prominently reflected in the Sustainable Development Goals of the United Nations. At the global level, the proportion of food insecure people has been on the increase since 2015. In our nation Nigeria, the growth in food insecurity is driven by two major threats to life namely, Boko Haram insurgency and violent conflicts between herdsmen and crop farmers. These two dangers are the biggest challenge to food security at present. Other challenges to food security include climate change and natural disasters, reduced food production, access to finance and insurance, low level of technology, pests and diseases and poor food market infrastructure. Measures to address food insecurity in Nigeria include eliminating insecurity, closing the gaps that exist between the genetic potential and actual yields of cultivated crops, proper use of agro-chemicals, development of appropriate technologies for production, processing and storage of food products, adoption of farmer friendly agricultural policies related to credits, insurance, early warning systems and access to inputs. Also, to ensure food security in Nigeria, scientists and researchers employed in Universities of agriculture must tailor their research efforts to solving agricultural problems.



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