UNIVERSITY OF ILORIN

THE TWO HUNDRED AND FORTY-FOURTH (244TH) INAUGURAL LECTURE

"MAKING ENDS MEET WITH FOOD SECURITY"

By

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Great Students of the University of Ilorin,
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Distinguished Ladies and Gentlemen.

Preamble

I give thanks and adoration to the Almighty Allah for directing my thoughts and giving me the grace to deliver this inaugural lecture. Standing here today is indeed one of the favours of the Almighty Allah on me and my family, that from a very humble background, I live to witness today. In line with the injunction of the Almighty Allah in the Glorious Qur'an (Q27:19), I say, "My Lord, enable me to be grateful for your favour which You have bestowed upon me and upon my parents and to work righteousness of which You approve. Make righteous for me my offspring. Indeed, I have repented to You, and indeed, I am of the Muslims."

The inaugural lecture of today is the 244th edition in the annals of the University of Ilorin. It is also the 16th in the Faculty

of Agriculture, 2nd in the Department of Agricultural Economics and Farm Management, and the 1stin the 2022/2023 Academic Session of the University of Ilorin. The 158thInaugural Lecture of this university, "Let the Small-scale Farmer be in Good Standing", delivered by Professor Olubunmi Abayomi Omotesho, my mentor, on the 28th May 2015 was the first in the Department of Agricultural Economics and Farm Management.

This lecture will not be complete without a brief retrospection into my journey in the field of Agricultural Economics. This happened after my initial two failed attempts to gain university admission through the Joint Admissions and Matriculation Board (JAMB) examinations to study Medicine, and Engineering, and subsequently, my inability to secure admission to the University of Ilorin, through the remedial programme because I was more qualified than what was required!

My admission to the University of Ilorin to study Agriculture was, however, seamless when I chose the course as my first choice. Although, I thought I could use it as a stepping stone to Medicine, especially coming from the background that I was once asked what was there to go and study about Agriculture in the university. Incidentally, my first interaction with Professor (then Dr.) O.A. Omotesho, who was the sub-Dean of the Faculty, and his amiable disposition and subsequent interaction which continued on a very pleasant note, piqued my interest in Agriculture and he became my Final Year Project Supervisor. Upon the completion of the mandatory National Youth Service Corps scheme, I commenced my Master of Science (M.Sc.) degree programme because he had asked me about my plans after the service year and I told him I wanted to pursue a higher degree and he directed me to obtain the application form, which was already on sale at the time. Once more, he became my Supervisor for M.Sc. degree dissertation and subsequently for my Doctor of Philosophy (Ph.D.) degree thesis with focus on Food Security. Hence, I became the first

student he supervised right from Bachelor degree level to the Ph.D. level.

Introduction

Mr. Vice-Chancellor, I crave your indulgence to allow me to give a little background on the subject matter of my inaugural lecture. Food insecurity is rampant in Nigeria as indeed, in many other countries, especially among the poor. A large proportion of the Nigerian populace are unable to make ends meet due to the dwindling purchasing power of their income. Hence, the palpable tension, fear and uncertainty in the society. Making ends meet in a metaphorical sense connotes being able to harmonise the necessary expenditure with income, attain personal or collective goals and aspirations, and live a comfortable life. However, these can only be achieved when there is food availability, adequacy and accessibility at all levels including individuals and households. Hence, the appropriateness of the Yoruba saying, *T'ebi b'a ti kuro ninu ise, ise buse* (that is, poverty ends the moment hunger is addressed). There could not be any improvement in the economic situation of the poor without deliberate efforts that will help them to improve their food security situation. Food security is therefore a necessary condition not just for poverty alleviation but for making ends meet. Besides, access to nutritious, affordable, and safe food is essential for all individuals to meet their full potentials. This, therefore, informs the choice of the title of this inaugural lecture, "**Making Ends Meet with Food Security**".

Food is necessary for health, growth and normal functions of living organisms including human beings (Omotesho, Joseph, Apata & **Muhammad-Lawal**, 2014). It is also of high importance in matters of wellbeing and economic productivity (**Muhammad-Lawal** & Omotesho, 2010a). As a basic necessity of life and human existence (**Muhammad-Lawal** & Omotesho, 2004), iimprovement in the food production-distribution-consumption activities is a matter of utmost importance, as man eats to live and no one is free from the need for food (Akinwumi, 2005). The ability to organise the

production of food in sufficient quantities and qualities for every member of a country therefore becomes a necessary condition for the survival of such country over time (John, 1993).

A major problem confronting many developing countries is the inadequacy of food supply in the face of rapidly growing population. Food shortages have been identified as potential sources of social and political instability. Considering the fact that millions of people suffer from under nutrition and micronutrient malnutrition globally (International Food Policy Research Institute - IFPRI, 2014), providing sufficient, safe and nutritious food to all people is therefore one of the major global concerns at all times (United Nations Conference on Trade and Development - UNCTAD, 2017). With about 811 million people in the world facing hunger as of 2021, food security status of millions of people, including children would continue to deteriorate and threaten the lives and livelihoods of people around the world, particularly the vulnerable, if no swift action is taken (Food and Agriculture Organisation - FAO, International Fund for Agricultural Development- IFAD, United Nations International Children's Emergency Fund - UNICEF, World Food Programme - WFP &World Health Organisation - WHO, 2021). It is therefore important to note that ensuring access to nutritious foods is critical to lifting more than one billion poor people out of poverty (IFPRI, 2013).

Food insecurity is a particularly serious issue in many low-income countries across the sub-Saharan Africa and South Asia, where the prevalence of human malnutrition is high (Omotesho, Joseph, Apata & **Muhammad-Lawal**, 2014). After decades on the sidelines, agriculture and food security have found their place at the top of the global development and policy agenda (IFPRI, 2013). One of the international efforts in recent times, to address the challenges to food security was the Millennium Development Goals (MDGs) which used the period of 1990 – 1992 as the starting point and concluded in 2015. Goal 1 was to end hunger and poverty, and one of its targets was cutting by half, the proportion of people who suffer from hunger.

Incidentally, most of the 72 out of the 129 countries monitored by the end of 2015, that had reached the target of MDG Goal 1 enjoyed stable political conditions and economic growth, accompanied by sound social protection policies targeting vulnerable population groups. On 1st January 2016, the 17 Sustainable Development Goals (SDGs) officially became the successor to the MDGs. SDG 2 aims to end hunger and ensure access to sufficient, safe and nutritious food by all people all year round. Overall, most of the SDG targets are related to achieving global food security (UNCTAD, 2017). With less than a decade to 2030, the world is not on track to ending world hunger and malnutrition. New projections confirm that hunger will not be eradicated by 2030 unless bold actions are taken to accelerate progress, especially actions to address inequality in access to food. All other things constant, around 660 million people may still face hunger in 2030 (FAO, IFAD, UNICEF, WFP & WHO, 2021).

As a country, Nigeria has a high rate of poverty. The poverty headcount rate was estimated to have jumped from 42% (89million) in 2020 to 42.6% (95.1 million) of the population in 2022 (World Bank, 2022). While the poverty situation was exacerbated by the COVID–19 pandemic, increasing costs of items in Nigeria due to the removal of fuel subsidy and floating of the exchange rate have made many more Nigerians to face difficulty in accessing food items. According to the Nigeria Bureau of Statistics, just as the consumer price index rose from 22.22% to 22.41% between April and May 2023, food inflation rate rose from 24.61% in April, 2023 to 24.82% in May 2023. When compared on a year-on-year basis, this was 5.33% points higher than 19.5% recorded in May, 2022. There was the concern that more than additional 25 million people might have faced the risk of hunger between June and August 2023, from the estimated 17 million people who were at risk of food insecurity in October, 2022. Unless urgent actions are taken to address the continuing conflict, climate change, inflation and rising food prices, Nigeria remains among the highest-level countries facing

acute food insecurity (FAO, IFAD, UNICEF, WFP &WHO, 2021; UNICEF, 2023).

One of the vital components of the food system globally, is agriculture (IFPRI, 2014). It is also the most important economic sector with a high level of socioeconomic relevance for many countries with respect to employment generation, nutrition and rural development. In view of this, agriculture appears to be the only realistic driver of economic and social development in many countries in the near future. Smallholder farmers produce more than 80% of world food production. Ironically, across all countries, people living in rural areas are the most exposed to food insecurity owing to limited access to food and financial resources. The majority of the people who are undernourished live in developing countries and rural areas, with agriculture at the centre of their economic activities (United Nations, 2007; UNCTAD, 2017).

Nigeria has one of the largest expanses of land in Africa with more than 900,000 km^2 (90 million hectares). While the country has an agricultural land area of about 84 million hectares, about 33 million hectares is currently under cultivation. In view of the large stretches of arable land, Nigeria has a good opportunity for food and agricultural production. With a population of more than 200 million people, about 80% of Nigerians depend on small-scale agriculture for their food need (Maxwell, 2018). Agriculture also provides employment for about 70% of the entire labour force and constitutes the main source of livelihood for the majority of Nigerians (Osasona, Olaghere, **Muhammad-Lawal** & Yusuf, 2019). In spite of this, the smallholder farming households are not only cash-poor, they are often food insecure. This impacts the physical and cognitive growth of children, and reduces productivity of the household members.

Evolutionary Trend in Food Security

Vice-Chancellor Sir, the evolution of food security as an operational concept in public policy has reflected the wider recognition of the complexities of the technical and policy issues

involved. Food security is a flexible and multi-faceted concept, variously defined and interpreted. This is as reflected in the many attempts at definition in research and policy usage. At one end of the spectrum, food security implies the availability of adequate supplies at global and national levels; at the other end, the concern is with adequate nutrition and well-being (FAO, 2003).

Interest in food security has been very strong since the 1972 – 1974 world food crises as it formed the dominant theme at the 1974 World Food Summit in Rome, where it was defined as the availability at all times of adequate world supplies of basic foodstuff to sustain a steady expansion of food consumption and offset fluctuations in production and prices. Since the World Food Summit of 1974 through the 1970s, food security was used with reference to aggregate food production or food availability, often at national or global levels (FAO, 1983; Technical Centre for Agriculture and Rural Cooperation, 1999). It was soon realised that the definition gave a very limited view of the food security problem. This is due to the fact that many people could be hungry even if there was enough food available nationwide during normal times. It is well recognised that the world produces enough food to feed everyone. Yet, there are nations, regions within countries, villages within regions, households within villages and individuals within households, who are unable to meet their food needs. This means that adequacy at the national level does not necessarily ensure adequacy at the household or individual level.

In 1983, FAO expanded the concept to include securing access by vulnerable people to available supplies when food security was defined as "ensuring that all people at all times have both physical and economic access to the basic food that they need". The concept was broadened to include safeguarding vulnerable individuals' access to available supplies, suggesting that the demand and supply sides of the food security equation should receive equal emphasis. As such, definition of food security evolved from viewpoints ranging from emphasis on national food security or an increase in food supply which has

been the case since the World Food Conference of 1974, to those calling for improved access to food in the 1980s.

In 1986, the World Bank report "Poverty and Hunger" focused on the temporal dynamics of food insecurity. It introduced the widely accepted distinction between chronic food insecurity, associated with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by disasters, economic collapse or conflict. The concept of food security was therefore further elaborated as "access of all people at all times to enough food for an active and healthy life" (World Bank, 1986).

By the middle of the 1990s, issues about malnutrition, food safety, and preferences had been incorporated into the concept of food security. As such, the 1996 World Food Summit organized by the FAO to address widespread malnutrition and to reaffirm international commitment to the fight against hunger and reduce by half the number of people who are hungry or undernourished by the year 2015, adopted an updated definition of food security, which states that, food security at the individual, household, regional, national and global levels is achieved when "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences, for an active and healthy life" (World Food Summit, 1996). This definition was broadened to incorporate food safety and also nutritional balance, reflecting concerns about food composition and micro-nutrient requirements for an active and healthy life. Food preferences, socially or culturally determined, also became a consideration. The definition was again refined in the "State of Food Insecurity, 2001", where food security is considered as "a situation that 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."Conversely, food insecurity exists when people do not have adequate physical, social or economic access to food (FAO, 2003, 2020).

Food security can be defined at various levels including individual, household, and larger population such as national, international and global levels. The need for a complete understanding of the concept calls for an analysis of food security at all these levels. Global food security implies universal access to adequate food supply. At the international level, food security means adequate global food availability and adequate capacity of the food-deficit countries to import or otherwise acquire food in required quantities from food-surplus countries. For this to be ensured, every barrier to trade, especially in food items, at the international level must be removed. Food security at the national level connotes adequate food availability from all sources to meet per-capita food requirement of the population over time. A food secure nation is able to ensure availability of food nationally, to meet current and future per capita requirements (IFAD, 1991; Omotesho & **Muhammad-Lawal**, 2013). While efforts to ensure adequate food supplies at the national, international and global levels are laudable, they cannot on their own ensure food availability for households and individuals. Essentially, food security can be considered as a phenomenon relating to individuals as the nutritional status of the individual household member is the ultimate focus (FAO, 2003).

At the household level, food security refers to household's ability to secure adequate food, either from its own production or through purchases, for meeting the dietary needs of all its members. A food secure household can therefore be defined as one which has access to enough food to ensure the minimum necessary food intake, for every member to lead a healthy life. For each household member to benefit from the food consumed, available food must be shared according to individual needs in terms of sufficiency, variety, quality and safety. As such, food security at household level is a necessary condition for an individual's food security (IFAD, 1991; Omotesho & **Muhammad-Lawal**, 2013).

Mr. Vice-Chancellor, availability of food, access to food, the biological utilisation of food, and the stability of same

constitute the four dimensions of food security. Food availability explains the quantity of food the households, regions or nations have at a point in time. It is a function of local food production, food importation, and food aid. On the other hand, food accessibility refers to the ability of a nation, household or individual to obtain sufficient food of guaranteed quality and quantity to meet the nutritional requirements. This might be directly through own-production, earned income, barter and exchange. Food accessibility could also be attained indirectly, via social arrangements. Food utilisation refers to the ingestion and digestion of adequate and quality food for maintenance of good health. It also means the biological use of food consumed and encompasses food safety. Finally, food stability has to do with the ability of households and individuals to have continuous access to the food source, with minimal risks (FAO, 2006).

Essence of Food Security

Mr. Vice-Chancellor, food security is not just as matter of humanitarian concern but one that has spiritual and divine dimensions as well. In the Glorious Qur'an, the Almighty Allah directs mankind to eat from whatever He has provided on earth that is lawful and good (Q2:168 & 172; Q5:88; Q16:114; Q20:18). The specified verses of the Qur'an emphasise the essentials of food security such as food availability, accessibility, safety and acceptability. Also, food security is a special favour of the Almighty Allah that confers safety, security and contentment (Q16:112; Q19:26; Q106:4). Besides, having food security constitutes one of the first sets of Allah's divine injunctions to mankind. This is because after human creation, the Almighty Allah enjoined Adam and his wife as a household to dwell in paradise and eat there from in abundance (Q2:35; Q7:19). Also, when Adam and his wife descended on to the earth, Allah made food a major source of provision for them and entire mankind (Q2:36). Under very dire circumstances, as provided for in the Glorious Qur'an (Q2:173; Q6:145), the Almighty Allah allows one facing food insecurity out of necessity, neither desiring it nor transgressing, to eat food items that are ordinarily not permitted.

Apart from its mundane connotations, striving toward food security for the vulnerable also has a cardinal place in matters of religion and devotions. In Q2:184 and Q5:89, the Almighty Allah highlighted the role of providing food to the vulnerable and the needy as a means of expiation for weakness, inadequacy or misconduct in matters of religious importance such as fasting and oath-taking. According to Falahi (2013), the institution of *Zakat* and *Sadaqah* in Islam is an important religious and social duty which is aimed at improving human wellbeing, including access to food for the poor and needy. Besides, achieving food security was used as a means of reassurance of trust in God and source of festival (Q5:112-114). Apart from making the feeding of the poor and the distressed a general social obligation, making efforts and supporting the needy including the vulnerable to achieve food security is a very important and highly rewarding endeavour. This is so crucial that Allah has made feeding of the needy such as the poor, orphans, and travellers among the very essential rites for seeking His favours, live a good life that is devoid of calamities, and earn His pleasure (Q76:8-12). Such act is also a means through which one can attain greater height with the Almighty Allah, achieve breakthrough in difficulties and belong to the rank of the righteous (Q90:10-14). On the other hand, taking actions that deprive the poor of food is tantamount to committing sins or neglecting some religious duty and could lead to the wrath of God both in this world and the Hereafter (Q64:33-37; Q74:41-44; Q89:16-20).

The consequences of food insecurity across the world are grave and alarming. According to the United Nations Conference on Trade and Development – UNCTAD (2017), lack of food security has both short and long-term negative impacts. Even short-term food insecurity has a long-term lasting impact on growth potential of the economy. For instance, undernutrition costs the global economy 2 to 3% of Gross Domestic Product (GDP) every year (IFPRI 2014). Apart from the direct obvious costs in terms of loss of human lives and well-being, there are

indirect economic costs of food insecurity including nutritional, health, human and economic development problems, as well as the deprivation of basic necessities of life. Food insecurity also constitutes the bane of major waste of resources and loss of productivity. Inadequate nourishment can lead to a lifetime of challenges, including stunted cognitive development, which can be passed on to future generations. People experiencing food insecurity often consume nutrient-poor diets, which may contribute to the development of obesity, heart disease, hypertension, diabetes and other chronic and associated non-communicable diseases. Furthermore, food insecurity together with poverty has been identified as one of the principal causes of increasing and accelerated migration from rural to urban areas in developing countries.

The determination to relegate hunger to history is a foundation for sustainable economic development (**Muhammad-Lawal** & Omotesho, 2004). Food security is necessary for better living standards among the majority of countries especially in Tropical Africa where people suffer from inadequate access to food (**Muhammad-Lawal** & Omotesho, 2006). Besides, freedom from hunger is an important indicator of economic development as no country can be said to experience development when a substantial proportion of the population suffers from inadequate nutrition (**Muhammad-Lawal** & Omotesho, 2010b). Food security is also a necessary condition to have a population that is healthy and well-nourished. It is also an essential, universal dimension of household and personal wellbeing (**Muhammad-Lawal** & Omotesho 2010c).

My Contributions to Research on Food Security

Vice-Chancellor Sir, I have focused my research largely on Agricultural Production Economics which is an aspect of Agricultural Economics that is concerned primarily with the application of economic theories to agricultural production; and Farm Management which is about making decisions regarding the use of the available agricultural resources. While some common goals of farm management

include profit maximization, risk reduction, and attainment of social goals, it is important to note that the attainment of food security remains the primary goal. Rural households constitute a large segment of the Nigerian population and the main source of food in Nigeria. In spite of the various government policies and programmes, it has been observed that food insecurity remains a major problem faced by most rural communities in Nigeria. Unless the multifaceted underlying causes of food insecurity at the rural household level are addressed, the number of hungry and malnourished people will remain very high.

Food Security Status

To be able to track the number of people without adequate access to healthy diet and provide the needed matrices to better understand the incidence of food insecurity, study by **Muhammad-Lawal** and Omotesho (2006) revealed that the proportion of rural households in Kwara State that were food secure ranged between 60 and 65.45% and household income and size affected their food security status. Average daily per capita protein availability was less than the minimum requirement of 60 g and there was a wide disparity between the food secure with excessively higher access to calories and protein than they required, and the food insecure with less than the required quantity of calorie and protein. Given that the root problem of inadequate access to food is poverty and that food insecurity problem of the rural households could be overcome either by strengthening the household resource base or by enhancing their control and management of the resources, **Muhammad-Lawal** and Omotesho (2004) indicated that optimal resource allocation would yield higher annual farm income that could be used to improve the food security status of rural household in Kwara State.

It is a well-known fact that many people do not eat well due to lack of nutrition education. **Muhammad-Lawal** and Omotesho (2010b) therefore developed an optimal food consumption plan for rural households. The rural households had an average weekly expenditure of ₦6,768.21 estimated at

₦119.96 daily per capita food expenditure on food items. To have food security for a household of eight people, a minimised value of ₦4,159.30 food plan per week comprising 4.17 kg of rice, 18.59 kg of maize, 2.92 kg of cowpea, 2.66 kg of *garri* (cassava flakes), 8.53 kg of fish, and 3.10 kg (3.40 lt) of palm-oil was developed. This was estimated at ₦73.73 per person per day. This implies that the cost of the food plan was below the poverty line set by the World Bank at ₦120 per person per day. It must be noted that inflation and devaluation of the currency have caused astronomical increase in the cost of the plan.

Similarly, **Muhammad-Lawal** and Omotesho (2010c) evaluated food insecurity status as well as the determinants of the severity of food insecurity among rural households in Kwara State. The study showed that 65.45% of the rural households had a mean daily per capita calories consumption of 1403.56 Kcal. The adjusted household size, food crop loss, and the level of consumption of various classes of food were the significant factors affecting the severity of food insecurity among rural households in Kwara State.

Improving access to adequate food and promoting better dietary intake are central activities in the drive to reduce the number of hungry and malnourished people. Increased interest in nutrition and health has heightened the need for a more complete understanding of food demand and consumption patterns. Food demand pattern is a very important determinant of food supply as well as quality of available diet. **Muhammad-Lawal** and Omotesho (2013) therefore showed that the rural household incurred an average of ₦6,768.21 per week on food. The food budget share was 20% on cereals, 5% on legumes, 24% on root/tubers, 19% on animal products, 6% on fats/oils, 13% on fruits, 7% on vegetables, and 8% on other food items. This implies that more than 40% of food demand among rural households was based on cereals, and roots and tubers. With respect to the dietary diversity behaviour of households, **Muhammad-Lawal**, Ibrahim *et al*. (2017) reveals that age, household income, gender, education level and household size

affected dietary diversity among rural households in Kwara State, Nigeria ($p<0.01$).

Considering its influence on crop production, Omotesho, **Muhammad-Lawal** and Ismaila (2014) examined the relationship between hired labour use and food security among rural farming households in Kwara State, Nigeria. The study reveals that only about a half of the households (51.1%) were food secure and there was a positive correlation between the use of hired labour and their food security status.

Food Availability

Mr. Vice-Chancellor, it is important to observe that agricultural production is very essential to food security. It affects the availability and access components of food security. For rural households, food availability depends largely on own production. My research on arable food crop production therefore highlight major issues affecting household food availability.

Arable Crop Production

Food security is often influenced by the level of arable food crop production. Therefore, an assessment of arable crop production in Edo State, Nigeria by Erie, Osifo and **Muhammad-Lawal** (2011) indicated that the farmers cultivated a mean farm size of 1.04 ha and that the major determinants of arable crop production among farmers were farm size, hired labour, quantity of planting material, quantity of fertiliser applied, quantity of herbicides and amount of credit ($p<0.05$).

As an important source of carbohydrate, maize is a staple food crop for most people in sub-Saharan Africa including Nigeria. In a study on the economic analysis of maize production in Ogori Magongo Local Government Area of Kogi State, Nigeria, Mohammed, Ayanlere, Ibrahim and **Muhammad-Lawal** (2012) revealed that the average farm size of the majority (95.55%) of the farmers was less than 2 ha. Also, maize production with a gross margin of ₦19,668/ha was affected by land, fertiliser and quantity seed ($p<0.01$).

Cassava, *Manihot esculenta* (Crantz), is one of the most important food crops which production fits well into the farming

systems of the smallholder farmers in Nigeria. In Kwara State, low level of productivity of cassava has been attributed to inefficiency in the use of resources. **Muhammad-Lawal**, Olatinwo, Bakare, Omotesho, Adekola and Mohammed (2012) indicated that the technical efficiency of cassava production in Kwara State was affected by the sex, age, education status of the farmers and their farm size ($p<0.01$).

Nigeria is a major importer of rice in the world with over US$756 million annual expenditure, due to insufficient domestic production. **Muhammad-Lawal** *et al*. (2013) revealed that small-scale rice farmers in Ogun State, Nigeria realised an average gross margin of ₦90,634.35/ha and that farm size, labour and production systems accounted for 80.50% of the changes in rice output. The study also revealed that farm size, labour and quantity of seed were underutilised in rice production.

In order to address the problems associated with yam production for which Nigeria is the largest producer all over the world, the National Root Crop Research Institute (NRCRI), and the International Institute for Tropical Agriculture developed the Yam Minisett Technology (YMT) as a rapid means of multiplying yam germplasm. Omotesho, Falola, **Muhammad-Lawal** and Oyeyemi (2012) carried out a comparative analysis of the technical efficiency of yam production based on the adoption of the technology among farmers in Alapa, Asa Local Government Area of Kwara State. The study showed that adopters of the YMT had higher technical efficiency estimated at an average of 80% than the non-adopters with an average of 62% technical efficiency.

Irrigation farming is essential for ensuring all year-round crop production, improved crop yield, and averting crop losses. **Muhammad-Lawal**, Adenuga and Jimoh (2013) carried out an assessment of the determinants of use of irrigation by smallholder farmers in some local government areas of Kwara State. The study revealed that gender and education status of the farmers as well as access to credit ($p<0.05$) were the factors affecting irrigation farming in Kwara State. One of the major

crops with potential for dry season farming is tomato. Efforts must be made to increase the efficiency of its production especially during the dry season. Adenuga, **Muhammad-Lawal** and Rotimi (2013) indicated that a gross margin of ₦18,956.75/ha (US$120.74/ha) was realised from dry season tomato production and that age, education status of the farmers, and access to credit had effects on the efficiency of dry season tomato production in Kwara State, Nigeria.

A close look at the problems faced in agriculture and approaches to solving them would reveal the vital importance of credit. Olatinwo, **Muhammad-Lawal** and Ayojide (2012) observed that cooperatives was a major source of credit among the farming households (39%) in Kwara State, Nigeria and that access to credit was affected by the interest rate, type of enterprise, and farm size ($p<0.05$).

Major Determinants of Food Production

The development of the agricultural sector of the Nigerian economy depends on the youths who serve as reservoir of labour for agricultural production, and women who contribute a substantial proportion of food production and preparation in Nigeria. Besides, use of improved production technology and access to advisory services also affect the level of agricultural and food production in Nigeria.

Women and Youth Participation in Agriculture

As part of efforts to encourage the participation of youths in agriculture, the Ondo State government established the Youth-in-Agriculture programme. **Muhammad-Lawal** *et al*. (2009) revealed that the technical efficiency of production among youths ranged from 33 to 96% with an average of 85%. Household size, years of experience, usage of extension information and level of education account for the variation in the technical efficiency among the youths.

To achieve food security on a sustainable basis, there is the need to acknowledge the role, concerns, and needs of women in food production. Omotesho, Adisa and **Muhammad-Lawal** (2013) showed that the average income from vegetable

production among women farmers was ₦69,560 per season (US$434.76). The use of herbicide, organic fertilisers, and storage baskets had low adoption rate among women farmers. The major problems encountered in production were infestation by pests and diseases, postharvest losses, lack of information, high input costs, and crop farm destruction by herdsmen's grazing cattle. In spite of their role in the production of highly needed food crops, women vegetable farmers generally had not received adequate institutional attention in Nigeria. Omotesho, Adisa and **Muhammad-Lawal** (2013) therefore showed that the farmers required crucial extension intervention in the areas of farm information sourcing, irrigation, crop protection, soil improvement, storage and marketing.

Use and Adoption of Improved Production Practices and Modern Technologies

Mr. Vice-Chancellor, use of improved production practices and modern technologies plays a major role in enhancing the stability of food crop production. Given that the greatest threat to sustaining productivity among farmers in Nigeria is the loss of soil fertility, Oloyede, **Muhammad-Lawal** *et al*. (2014) carried out an analysis of soil management practices in cereal-based production systems among small-scale farmers in Kwara State, Nigeria. The study indicated that the majority of the farmers practised crop rotation (74.6%), fertiliser application (69.5%) and ridging (94.1%). It was also shown that farm size, age, education, extension contact, number of farm plots, labour and household size affected the usage of crop management practices in cereal-based farming systems among the farmers. Furthermore, **Muhammad-Lawal**, Omotesho *et al*. (2014) indicated that the major constraints to the use of sustainable crop management practices among small-scale farmers in Kwara State included inadequate supply of fertiliser, inadequacy of labour and credit, poor knowledge of improved agricultural practices, poor transportation, low produce prices and high cost of production.

The Federal Government of Nigeria, in a bid to accelerate cassava production and utilisation, put in place programmes such as the Presidential Initiatives on Cassava Production and Export with the aim of promoting cassava as a foreign exchange earner for the country. This necessitated the introduction of improved varieties of cassava to the farmers. **Muhammad-Lawal**, Lawal *et al*. (2010) noted that only 40.34% of the small-scale farmers in Kogi State, Nigeria cultivated improved varieties of cassava. Cooperative membership, educational status and cost of planting materials ($p<0.01$) influenced the use of improved cassava varieties among the farmers. Similarly, Ayanlere, **Muhammad-Lawal** and Ayanlere (2015) examined the determinants of household decision to use improved seeds in cereals production in Kwara State, Nigeria. The study showed that 35% of the households used improved seeds in cereal crop production while high cost of improved seeds, untimely availability of the seeds and decreasing soil fertility were the major limitation to cereal production. Considering the fact that local production is yet to match the growing domestic demand for rice in Nigeria, Oloyede, **Muhammad-Lawal** *et al*. (2019) assessed the adoption of improved rice production technologies among rice farmers in Nasarawa State. The study showed that education level, household size, off-farm income, number of extension contacts and farm size were the factors affecting adoption of improved rice production.

In spite of the development and use of various improved varieties of maize, yield in Nigeria has continued to be hampered by a wide range of pests and diseases. Omotesho, **Muhammad-Lawal** and Iyiowu (2016) therefore investigated the relationship between use of agrochemical inputs and maize yield as well as determined the factors affecting agrochemical usage among small-scale maize farmers in Iwo Local Government Area of Osun State. The study revealed that there was 78.5% positive relationship between the use of agrochemical and maize yield ($p< 0.01$). The determinants of agrochemical inputs use among

the farmers were farm size, income, education status and household size ($p<0.1$). This is in agreement with the study on the constraints to the use of agrochemicals among crop farmers in Kogi State, Nigeria by Memudu and **Muhammad-Lawal** (2013) which showed that the majority of the farmers (63.3%) did not use agrochemicals due to the high cost.

Furthermore, Oloyede, **Muhammad-Lawal** *et al*. (2016) assessed the effect of pesticide usage on leafy vegetable production. *Corchorus olitorius* (*Ewedu*) was shown to be produced by the majority (84.17%) of small-scale farmers while bitter leaf, *Vernonia amygdalina* was the least produced. The study also revealed that age, fertiliser use, farm income, family size, farm size, years of experience, pesticide training, and access to credit were the determinants of pesticide usage in leafy vegetable production ($p<0.10$).

To increase the availability of food crops, there is the need for appropriate use of soil fertility management practices. Adenuga, Omotesho, Olatinwo, **Muhammad-Lawal** and Fatoba (2012) therefore assessed the usage of recommended soil fertility management practices in dry season amaranthus vegetable production in Kwara State. It was shown that the majority of the farmers (53.33%) used inorganic fertilisers. The average rate of fertiliser application for nitrogen, phosphorus and potassium in dry season amaranthus production was 38.38, 25.60 and 24.85 kg/ha compared with the recommended rate of 94, 80 and 71 kg/ha, respectively. The compliance with the recommended rate of application was affected by farm size and contact with extension agents. Similarly, Ayanlere, Mohammed, **Muhammad-Lawal** *et al*. (2014) revealed that the average fertiliser rate among small-scale maize farmers in Ijumu Area of Kogi State, Nigeria was 166.39 kg/ha. The determinants of fertiliser use intensity were age, gender, education level, household size, access to credit, cost of fertiliser and access to extension services ($p<0.01$). Besides, unavailability (100%) and high cost of fertiliser (86.67%) as well as inadequate capital (80%) were the constraints to fertiliser usage.

Intercropping has been described to have higher efficiency of utilisation of resources and yield advantage, compared to sole cropping (Kowal & Kassen, 2001). Assessment of the economics of maize/tuber intercrops in Kabba/Bunu Local Government Area of Kogi State, Nigeria by Mohammed, Ayanlere, Abdullahi and **Muhammad-Lawal** (2010) revealed that maize/tuber intercrops were profitable with maize/yam intercrop having the highest gross margin of ₦59,507/ha, followed by maize/cassava, maize/cocoyam, and maize/sweet potato intercrop with gross margin of ₦40,275/ha, ₦37,942.22/ha and ₦31,576.28/ha, respectively. With an average of 0.84ha of land, maize/yam intercrop gave the optimum returns of ₦34,523.80. Similarly, maize/cowpea intercrop is a very common practice among farmers that offers a lot of advantages including improved crop yield through soil improvement. Assessment of the resource-use efficiency of maize-cowpea cropping system in Oyun Local Government Area of Kwara State by Ayanlere, Mohammed, Dutse, Abdullahi and **Muhammad-Lawal** (2012) indicated that quantity of seeds, farmland, and fertiliser were underutilised, while labour input was over-utilised.

Access to Advisory Services

Knowing that active participation in farmer-group activities is central to the success of agricultural extension, Omotesho, Ogunlade *et al*. (2016)carried out a study which indicated that total annual income, farm size, number of extension contacts, membership of farmer groups, access to credit and access to training influenced participation in group activities among farmers in Kwara State, Nigeria ($p<0.10$). The inability of public extension service system to adequately respond to the challenges of agricultural development and modernisation in Nigeria calls for alternative systems, including commercialisation of extension services. Adisa, Matanmi and **Muhammad-Lawal**. (2010) therefore studied the perceptions to commercialisation of extension service among women farmers in Kwara State. It was revealed that the farmers were negatively

disposed to commercialisation of extension services. Also, education (r=.644), farming income (r=.754), and farm size (r=.776) had positive relationships ($p<0.05$) with the perception of women farmers to the commercialisation of extension services.

The realisation that there has not been any appreciable improvement in agricultural extension officer's use of Information Communication and Technology (ICT) might be suggestive of their training deficiencies. In this regard, the assessment of the ICT training needs of extension officers in Kwara State, Nigeria by Omotesho, Ogunlade and **Muhammad-Lawal** (2012) revealed that more than 70% of extension officials had training needs in internet browsing, word processing, electronic mail and use of ICT for presentations. In addition job status was identified as themajor determinant of training needs in most of the selected ICT areas.

Food Access

Vice-Chancellor Sir, increase in income is necessary for better food access. This is because the ability to obtain sufficient quantity and quality of food required for food security depends on the amount of money earned by the households. In agriculture, such income might be earned through commercial farming, animal production, and postharvest handling.

Commercial Farming

Vegetable production makes important contributions to increasing income among farming households. A study by **Muhammad-Lawal** (2005) on the economics of wet season okra production in Kwara State therefore revealed that the average farm size among the farmers was 1.15ha and that with an average unit price of ₦18.23/kg, wet season okra production had a gross margin of ₦24,199.56/ha. Given that many pastoral communities have diversified to agropastoralism due to degradation of grassland and reduction in access to grazing resources thereby increasing their vulnerability to loss of livestock assets, study by Omotesho, **Muhammad-Lawal** *et al.* (2015) revealed that leafy vegetable production was profitable

with a gross margin of ₦23,379.47/ha among agropastoralists who had an average of 86.9% technical efficiency.

Cocoa is a cash crop with enormous contribution to the Nigerian economy. It offers both direct and indirect employment especially in the South-west states of Nigeria. Ayanlere, Ekenta, Mohammed, Afolabi, **Muhammad-Lawal** and Saibu (2012) carried out an analysis of the socioeconomic factors affecting its production in Gboyin Local Government Area of Ekiti State, Nigeria. The study revealed that the majority (85.72%) of cocoa farmers had a maximum of 3ha of cocoa farm and that household size, quantity of agrochemicals and level of education had effect on cocoa production ($p<0.05$).

Sugarcane, *Saccharum officinarum*, is one of the most important crops grown for domestic and industrial uses. In spite of this, its level of production has not kept pace with consumption. Omotesho, **Muhammad-Lawal** *et al*. (2013) assessed the technical efficiency of sugarcane production in Niger State, Nigeria. It was observed that sugarcane production was profitable with an average gross margin of ₦401,606/ha. Besides, the technical efficiency of sugarcane production estimated at an average of 69.52% was affected by experience and family size ($p<0.05$).

Cotton production is a major source of income among farmers in Katsina State. Amolegbe, **Muhammad-Lawal** and Olatunbosun (2015) therefore indicated that cotton/cowpea intercrop at 0.99ha to generate ₦164,918.60 was the optimal farm plan for farmers. The average technical efficiency was 76%. Tractor use, fertiliser application, farm size and quantity of seed planted had positive effects on production while age and farm size reduced the technical inefficiency of the farmers in cotton production. The major constraints faced in cotton production were inadequate fertiliser, low pricing of produce, inadequate credit and high labour requirement.

Watermelon is one of the commonest fruits consumed in many parts of the country, especially the urban centres. Omotesho, **Muhammad-Lawal**, Amolegbe and Udoh (2016)

revealed that the gross margin for watermelon production in the Federal Capital Territory was ₦86,508.46/ha during the peak period. This increased to ₦202,912.10/ha during the off-season due to increase in price. The majority of the farmers (90%) had technical efficiency above 80%. The factors affecting the technical efficiency of watermelon production were farm size, education level and years of experience ($p<0.05$). The most severe constraints to watermelon production were non-availability of irrigation facilities, transportation problems, and low pricing especially during the peak period.

Omotesho, **Muhammad-Lawal**, Amolegbe and Abubakar (2017) carried out an assessment of dry season garden egg production among small-scale farmers in Edu Local Government Area of Kwara State. The study revealed that the net farm income to irrigated garden egg production was ₦ 24,582.68/ha. Also, farm size and household size had effect on production, while labour, fertiliser, farm size and use of chemical had significant effect on technical efficiency of production.

Animal Production

Considering the need to curb the challenges of food insecurity and give more access to animal protein among the populace, **Muhammad-Lawal** and Omotesho (2010a) revealed that fish production in Kwara and Kogi States depends on the quantity of fingerlings, labour input and quantity of feeds. Also, Adedeji, **Muhammad-Lawa**l *et al*. (2016) assessed the returns to catfish production in New Bussa town of Borgu Local Government Area of Niger State, Nigeria. A total net profit of ₦118.65 was realised per kg of fish. Education level, number of fingerlings, size of pond, labour, and cost of feed ($p<0.10$) accounted for about 97% of the variation in total returns to fish production.

Sheep and goats constitute over 90% of small ruminant population in Africa. They are highly adaptable to broad range of environments, and require less capital investment. **Muhammad-Lawal** *et al*. (2016) therefore assessed the costs and returns to

goat production among rural households in Kogi State. The study showed a total of ₦93,537 and ₦216,803 as the annual costs and returns to goat production enterprise per household, respectively. Also, the number of goats owned by the households, quantity of feeds and cost of medication and veterinary services were the major drivers of the returns to goat production.

Assessment of the economics of quail production in Ilorin, Kwara State by **Muhammad-Lawal**, Amolegbe and Abdulsalam (2017) revealed that feed constituted 73% of the variable cost of production, estimated at an average of ₦212,850, to realise an average gross margin of ₦172,830 per season per farm. The mean technical efficiency of quail production was estimated at 60.5%. The major factors affecting the technical efficiency were feed, stock size, experience and farmer's education level.

Postharvest Handling

Mr. Vice-Chancellor, major postharvest handling including processing, storage and distribution improve the shelf-life of food products and the stability of food access. Besides, use of appropriate postharvest technologies is necessary for reducing wastage associated with the Nigerian agricultural sector.

In view of the importance of groundnut as an oilseed and food crop, in generating employment and income through on-farm production and processing, **Muhammad-Lawal**, Animashaun and Towoju (2012) carried out an economic assessment of small-scale groundnut processing among rural women in Edu and Patigi Local Areas of Kwara State, Nigeria. It was revealed that 50 kg of groundnut was processed into 59.79 litres of groundnut oil, 13.17 kg of *kulilkuli* (groundnut cake), and 4.17 kg *donkwa* (muffin) to earn a net return of ₦4,643.28. The major factors affecting the efficiency of groundnut processing estimated at an average of 88.26% were membership of association, years of experience and household size ($p<0.01$).

Garri is a common product of cassava processing. Omotesho, **Muhammad-Lawal**, Odepidan and Memudu (2012) noted that the technical efficiency of *garri* processing in Kwara

State was 91%. Similarly, economic analysis of cassava processing in Ibarapa East Local Government Area of Oyo State, Nigeria by Lawal, **Muhammad-Lawal** and Ayantade (2013) indicated that there was a net return of ₦7,950 and ₦8,500 per pickup load of cassava over a cycle of eight days for *garri* and *lafun (*cassava flour), respectively. Level of education, years of experience, membership of cooperative societies, and access to credit had positive effect on returns to cassava processing.

Palm oil processing in Nigeria is constrained by low level of investment due to inadequate information on the profitability potentials of the enterprise. **Muhammad-Lawal**, Amolegbe, Adenuga et al. (2014) revealed that palm oil processing was the main source of income among 40% of the processors in Ogun State. With the rate of return estimated at 31.3%, the net return to palm oil processing was determined at ₦13,516.70 per cycle. The major factors affecting palm oil processing were quantity of palm fruit, labour input, quantity of water used for processing and firewood ($p<0.05$).

Cowpea can be processed into so many forms. Therefore, **Muhammad-Lawal**, Salau and Folorunso (2016) showed that the daily returns to cowpea processing in Ilorin Metropolis was ₦1,229.10, ₦1,108.90, ₦757.23 and ₦519.22 and for *Moin-moin* (bean pudding), *Akara* (bean cake), *Ewa* (cooked beans) and *Ekuru* (beans pudding), respectively. Also, the quantity of cowpea and firewood as well as the level of education account for 87% of the changes in the returns to cowpea processing.

Analysis of the processing of *dodo ikire* (overripe plantain snacks) in Ikire, Osun State by Amolegbe, **Muhammade-Lawal** and Fayemo (2016) showed that the processors sold 31.9, 71.3 and 85.9% of the commodity to the collectors, retailers, and direct consumers, respectively. An average of 66.90 kg of *dodo ikire* was produced from 547.55 kg of overripe plantain over an average of nine-day cycle. The average gross margin of *dodo ikire* processing was ₦19,191.44

per cycle. The major constraints to *dodo ikire* processing were stress in processing as well as inadequate market and capital.

Olatilewa, Omotesho and **Muhammad-Lawal** (2017) carried out a study to examine the effect of storage techniques on weight loss and net marketing margin of sweet orange. The study showed that the use of polypropylene sack had the highest orange weight loss (5.93%), followed by 1.12% spoilage in orange fruits poured directly in bus, as 0.32% weight loss was recorded for orange fruits packed using stackable ventilated plastic crates in transit. Also, the use of pot-in-pot, wall-in-wall, metal-in-wall, tin-in-pot and local storage media recorded 25.94, 36.32, 38.41, 42.9 and 44.23% orange weight loss, respectively, during storage. The study also indicated that the use of aloe-vera gel and vaccine in both improved and local storage technologies recorded positive net marketing margin of ₦5,336.07 and ₦26,562.07 per tonne, respectively ($p<0.05$).

Food distribution as the process through which food gets to the consumers, from the point of production plays important role in improving the stability dimension of food security. **Muhammad-Lawal**, Amolegbe, Oloyede and Lawal (2014) showed that food crop farming households in Osun State had Commercialisation Index of 51.7% and that the majority of the households (54.6%) were into commercialisation of more than 50% of their farm produce. The average distance from farm to the nearest market was 17.5 km. It was also revealed that use of modern machinery and storage facilities were the major determinants of commercialisation of food crops. While produce marketing constitutes the major source of livelihood for the majority of the rural households, **Muhammad-Lawal**, Ibrahim, Oloyede and Abdulraheem (2015) observed that the majority (58%) of the farming households in Kwara State participated in rural markets, and that participation was affected by education status, access to credit, access to market information, commodity prices and marketable surplus ($p<0.05$).

Food Utilisation

Provision of safe and nutritious food required for effective utilisation of food can be enhanced through organic agriculture. However, there is little information on the profitability of application of liquid fertilisers in crop production as a form of organic farming. Olaghere, Omotesho and **Muhammad-Lawal** (2017) therefore carried out comparative analysis of the profitability of liquid fertiliser usage in dry season vegetable production in the Southern Guinea Savanna zone of Nigeria. It was observed that 60% of liquid fertilisers users cultivated only fruit vegetables, mainly okra and pepper. While the combination of both liquid and non-liquid fertilisers gave the highest yield of 1,374 kg/ha, use of sole liquid fertiliser on exotic vegetables recorded the highest profitability of 323% return to capital investment. Furthermore, Olaghere, **Muhammad-Lawal** and Omotesho (2018) identified lack of instructions on usage as the most severe constraint to the use of liquid fertiliser.

In response to the growing concern among consumers about the type and quality of meat for consumption, Omotesho, **Muhammad-Lawal**, Salami and Oko (2017) analysed the effect of quality attributes of meat on its demand in Ilorin Metropolis of Kwara State, Nigeria. Apart from beef (50%) and chicken (23.9%) being the preferred meat, the quality attributes used by the meat consumers in order of their importance were freshness, hygiene of the market outlet, odour of the meat, fat deposit, packaging, and price of the product.

The quest for more high-quality protein has led to the need to support healthy bird performance through the use of feed additives including essential oils. Karim, Bolu, **Muhammad-Lawal** and Musa (2018) assessed the effect of different essential oils on the cost of broiler feed and broiler weight gain. The study indicated that the average weight of live birds increased with the addition of essential oil by 0.08, 0.12, 0.17 and 0.22 kg for pumpkin, lemon and soybean, respectively. While the inclusion of essential oils from lemon and maize increased feed consumption by 0.04 and 0.80 kg per broiler, respectively, the

use of essential oil from maize, soybean, pumpkin and lemon, increased the cost of feeding by a minimum of ₦109.80, ₦76.62, ₦53.30 and ₦9.84 per broiler, respectively.

Drivers of Food Security

Vice-Chancellor Sir, the contributions of livelihood status and climate change to food security cannot be over emphasised. It is therefore important to highlight the impact that livelihood status and climate change have on food security.

Livelihood Status

The assessment of the links between food security and rural livelihoods is central to overcoming widespread food insecurity (Mutea *et al*., 2019). Livelihood status is usually affected by the household's level of poverty, gender empowerment and social capital. In order to determine the relationship between food security at household level and the sustainability of livelihood activities, Aremu, **Muhammad-Lawal** and Oyelere (2022) carried out a study in which it was discovered that 75.07% of the households had a maximum of 40% rural economic activity sustainability index. Also, 89.16% of households had below the minimum of 2,470 Kcal and 65g crude protein per capita required for food security. This implies that the majority of the households who were food insecure were also livelihood insecure.

Poverty, described as the failure of the economic system to generate sufficient income and distribute it broadly enough to meet households' basic needs has far-reaching dimensions and implications for the social harmony and stability (Omotesho, Joseph *et al*, 2017). **Muhammad-Lawal**, Omotesho *et al*. (2010) assessed the poverty status and factors affecting its severity among rural households in Osun State**.** With the poverty line estimated at ₦1,067.00 monthly per capita expenditure, it was observed that 33% of the rural households were poor and the severity level of poverty was affected by the household major source of income, household's size, monthly income and expenditure ($p<0.05$).

Nigerian women farmers have continued to be disadvantaged economically, socially and politically, with adverse consequences on their productivity and food security. Study by Omotesho, **Muhammad-Lawal**, Jimoh *et al*. (2017) on the level of empowerment among women in rural areas of Kwara State, Nigeria indicated that 80% of women were at the low to medium level of empowerment. Education level, gender of household head, membership of social groups and access to credit were the significant ($p<0.10$) factors affecting the level of women empowerment. Similarly, analysis of the effect of women empowerment on food security among households in Kwara State, Nigeria by Jimoh *et al*. (2018) showed that 52% of the households were food secure and only 45% of women had up to medium level of empowerment. It was also revealed that women empowerment had positive effect on food security among households in the study area ($r=0.245$).

Ayanlere, Omotesho and **Muhammad-Lawal** (2018a) assessed the socio-economic factors influencing the level of social capital among small-scale farming households in Kogi State. The study showed that the level of social capital to which farming household belonged was affected by the socioeconomic characteristics of the head of the household such as sex, age, level of education, and amount of credit. Others were position held in group by household members and total farm size of the household ($p< 0.05$).

Fertiliser use is very important in crop production as adequate and proper application of fertiliser enhances crop yield. Considering this fact, Ayanlere, Omotesho and **Muhammad-Lawal** (2018b) assessed fertiliser use level and group participation among farming households in Kogi State, Nigeria. The study revealed that there was 64% level of participation in agricultural groups and that the majority (85%) of the households used fertiliser at an average application rate of 120.74 kg/ha. Besides, there was a significant difference ($p<0.01$) in the quantity of fertiliser used by households that participated in groups and those that did not. Furthermore,

Ayanlere, Omotesho and **Muhammad-Lawal** (2018c) revealed that the intensity of fertiliser usage increased with increased social capital index among small-scale farming households in Kogi State, Nigeria ($p< 0.05$).

Climate Change

Climate change is expected to affect the stability of agricultural production and food security. Assessment of the perception of farming households in Ekiti State on climate change by **Muhammad-Lawal**, Salau and Saka (2012) indicated that low rainfall (55%) and reduced yield (60%) were perceived as the major effects of climate change. In addition, the study revealed that the notable strategies adopted by the farmers to combat unpredictable weather conditions were diversification of income sources (44%) and delay in the time of planting (23%).

Similarly, assessment of sorghum farmers' choice of climate change adaptation strategies by **Muhammad-Lawal**, Amolegbe and Yunusa (2017) revealed that the household size affected the use of adaptation strategies among the farmers, and that the number of strategies used, farming being the major source of income, farm income and farm size had positive relationships with investment in climate adaptation strategies among the farmers in Kwara State, Nigeria.

Other Professional and Administrative Contributions

Vice-Chancellor Sir, in addition to my contributions in the area of research, I have also carried out many administrative responsibilities and community services in the University of Ilorin and beyond. I have successfully supervised 11 Ph.D. theses, 28 M.Sc. dissertations and numerous undergraduate final year projects. I have also served as External Examiner to various higher institutions for different academic programmes in the field of agriculture such as National Diploma, Higher National Diploma, as well as Bachelor of Agriculture, M.Sc. and Ph.D. degrees. I have also served as External Assessor for the promotion of colleagues to the professorial cadre across various universities in Nigeria.

I have also been involved in numerous tasks and activities within the university community. While I am currently serving as the Director of the Regional Centre of Expertise (RCE) on Education for Sustainable Development, Faculty of Agriculture Representative on the Business Committee of Senate (BCOS), and member of the Board of GgMax Unilorin Poultry Ltd., I have had the privilege to serve as Deputy Director, (Community Business Ventures) UNILORIN Consultancy Services Centre, member of Postgraduate School Board, and pioneer member of the University Ethical Review Committee. Similarly, I had held the position of Postgraduate Programmes Coordinator and Acting Head of the Department of Agricultural Economics and Farm Management. I was also the Chairman of some committees in the in the University.

Furthermore, I was the Chairman, Technical Committee of the Local Organising Committee of the Nigerian Institute of Food Science and Technology Western Chapter Half-yearly Conference/General Meeting held at the University of Ilorin, Ilorin in 2012, and the 23rd Annual Conference of the National Association of Agricultural Economists, Malete 2023, hosted by the Kwara State University (KWASU), Malete between 16th and 19th October, 2023.

In order to assess the impact of the bird flu on the poultry subsector of the Nigerian economy, I was appointed as a Consultant to the International Livestock Research Institute (ILRI), Ibadan, Nigeria, under the framework of the Department of International Development – DFID, International Food Policy Research Institute -IFPRI and United States Agency for International Development – USAID Sponsored Project on Pro-poor Strategies in Highly Pathogenic Avian Influenza (HPAI) Analysis. Similarly, I was engaged as a Consultant to the Development Associates, Abuja in 2019 to carry out the Pilot Study on the Performance of States Government on the Development of Agribusiness in Nigeria using Ekiti and Kebbi States as a Case Study.

I have also had the opportunity to be engaged as Consultant to some of the World Bank Assisted Projects including Commercial Agriculture Development Project (CADP) in Nigeria in 2017, West Africa Agricultural Productivity Programme (WAAPP-Nigeria) in 2016, Intermediate Outcome Evaluation of Youth Empowerment and Social Support Operation (YESSO) in Kwara State in 2020, and Environmental and Social Audit under the Nigeria COVID-19 Action Recovery and Economic Stimulus (CARES) in Kwara State in 2022. Finally, I have been engaged as Co-Principal Investigator on Rural Digital Literacy, Rural Output Market and Demand for Rural E-Commerce in Nigeria under the Feed the Future Advancing Local Leadership Innovation and Network (ALL-IN) from 2021 to date.

Conclusion

Vice-Chancellor Sir, the primary aim of any economic and livelihood activity is the attainment of set goals. I have therefore demonstrated the extent to which individuals and households are able to attain the goals of their livelihood activities. It is however important to note that without food security, the attainment of all goals of livelihood activities in the most effective manner will continue to remain elusive. This is because food security remains the most veritable vehicle through which the populace can attain such goals in the most satisfactory manner, achieve the desirable outcomes of their economic activities, make ends meet, and achieve sustainable livelihood.

In spite of this, the level of food security and nutritional wellbeing especially among the poor, majority of whom are engaged in agriculture and have low economic status, is less than satisfactory. This portends a negative consequence for sustainable development of the country. Apart from the socioeconomic circumstances of most rural households, factors such as vulnerability to climate change and dwindling fortune of agriculture due to conflict and insecurity will continue to contribute negatively to food security in Nigeria. My research will therefore continue to focus on ensuring that the use of

available resources is made to achieve set goals without compromising food security.

Recommendations

Mr. Vice-Chancellor, efforts should be made to improve food security in Nigeria and support the populace to make ends meet by taking the following measures:

1. **Enhanced Ability to Acquire Food**: Agriculture is a source of food, income and livelihood among the majority of Nigerians. Improvement in agricultural production and rural livelihood activities is therefore necessary for boosting food supplies and simultaneously increasing the income of farming households, and reducing the prices people pay to access food.
2. **Improved Funding and Effective Implementation of Food Security Programmes:** There must be political will by the government to ensure that budgetary allocation reflects the central importance that food security has for the welfare of the populace. The implementation of the palliative measures to address the problem of emergency food insecurity should be carried out with fairness, equity and efficiency.
3. **Support for Rural Livelihood:** Interventions along food supply chains are needed to increase the availability of safe and nutritious food. The implementation of Social Investment Programme should support agricultural production aspects of rural livelihood through strategic subsidy of the production of major food commodities and patronage of the rural farmers in the purchase of the commodities.
4. **Increased Efficiency in Agricultural Production:** Government should design policy strategies that would encourage technology transfer as well as ensure the use of modern farming techniques by the smallholder farmers. It is crucial to support the adaptation of sustainable

agricultural technologies to local conditions and the needs of the smallholder farmers.

5. **Improved Postharvest Handling and Nutrition Education:** It is necessary to have improved education for the chain of food handlers, especially, from the producers to the consumers. This is necessary to be able to take steps to prevent or minimise food waste, and deliver fresh and wholesome food items that are safe and nutritious for human consumption at all times.
6. **Security of Lives and Property:** While efforts should be intensified in solving the problem of insecurity, there should be efforts to integrate humanitarian, development and peace-building policies in handling issues in conflict-affected areas. It is imperative that policies and actions to reduce immediate food insecurity and malnutrition are implemented simultaneously with those aimed at a reduction in the levels of conflict and aligned with long-term socioeconomic development and peace-building efforts.
7. **Scaling up Climate Resilience:** The use of available resources for agricultural production should be carried out in a way that can deliver a climate-positive future that will give priority to protecting nature, sustainably managing existing food production and supply systems, and restoring and rehabilitating natural environments.
8. **Economic Empowerment Programme:** It is imperative to tackle poverty and structural inequalities by ensuring that interventions are pro-poor and inclusive. Measures of empowerment should include increased access to production resources, natural resources, agricultural inputs and technology, financial resources, as well as knowledge and education.

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