THE IMPACT OF GOVERNMENT AGRICULTURAL EXPENDITURE ON AGRICULTURAL PRODUCTIVITY IN NIGERIA

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Public expenditure can be described as any amount of money spent by the government, and when such amount spent is traceable to promotion of agricultural-related matters, it can be referred to as agricultural expenditure. Nigeria's public agricultural expenditure increased from 1.9 million in 1971 to 10.7 million in 1973 and 22.4 million in 1975, just as agricultural spending surged quickly in the 1990s, reaching N593.16 billion in 1999, N701 billion in 2020, and around N1.1tn, 1.5tn and N2tn in 2021, 2022 and 2023 respectively (Central Bank of Nigeria, 2024). In spite of the foregoing, agricultural output has been on the downward trends for decades while food import bills have assumed worrisome rise according to Nigeria Bureau of Statistics (2023). This then calls into question, the essence of yearly rising agricultural expenditure on agricultural productivity, and underscores the need to address the ignoble paradox of increasing agricultural expenditure versus decreasing agricultural productivity in Nigeria.

Nevertheless, agriculture is a sector that countries globally, even the ones that cannot boast of a quarter of the arable land in Nigeria never joke with, due to its potency to feed population, boost economic growth and generate inflows of foreign exchange, among other benefits. For this reason, countries that appreciate the importance of agriculture usually convene agricultural and food summit annually where critical issues and ideas capable of sustaining and improving agricultural productivity are robustly discussed and policy formulated to boost agricultural

productivity in the next fiscal season. This is the practice in developed countries like, China, India, Brazil, Russian and Ukraine which are today undoubtedly ranked as top food producing countries with landmark productions and net export of several agricultural produces, which among others, include barley, sorghum, cereals, wheat and palm oil (Adeyanju, 2024). These countries sustainably see agriculture as one of the mainstays and the key drivers of their economies and hence, ensure that necessary attention is directed to agriculture, including but not limited to making huge investment to mechanize agricultural productions. This is in contrast to African continent where, despite its agrarian nature, its dedicated attention to agriculture has been consistently adjudged as fallen short of what is required to feed her population and transform the continent to net exporter of agricultural produces (World Bank, 2020).

Even in Nigeria's context, the situation is worsening; despite the huge revenue so far realised from oil wealth, Nigeria had not been able to invest in agriculture to the extent of making her rank among the league of nations with net export of agricultural products. This is in spite of the fact that in the last five years, huge amounts in sum of N9.120tn, N8.916tn, N10.810tn, N13.080tn and N16.39tn on the average have been the approved budget estimates for each of 2018, 2019, 2020, 2021, 2022 fiscal years (National Bureau of Statistics, 2022). With the foregoing annual appropriations, ordinarily, an agrarian country like Nigeria would have been expected to appropriate significant proportion of these yearly budgets to agricultural sector that employs about 36% of her workforce and averagely accounts for 24% of her Gross Domestic Products (Central Bank of Nigeria, 2022).

However, the proportion of the budgetary allocations to agriculture over the years is disappointedly low compared to annual budget estimates: for instance, National Bureau of Statistics (2024) reveals that between 2020 and 2024, a pittance of N132bn, N145bn, N154bn and N183bn, which are all just less than 2% of the total budgets were respectively appropriated to agriculture that currently absorbs 36% of the Nigeria's workforce. This is grossly below the 10 percent goal set by African leaders in the 2003 Maputo agreement, and far below the Food and Agricultural Organisation (FAO) recommendation in 2013 and 2015 that 25% of government capital budget be assigned to the agricultural development projects. It is therefore obvious that the recommendations of the foregoing referenced continental agreements underscore the importance of agricultural sector, and implies that agricultural-bound public expenditure, if properly channelled, is expected to positively influence agricultural productivity of a country for the overall growth in the economy.

Moreover, the above continental agreements are in tune with Balanced Growth Theory by Rossenstein-Rhoda which states that there should be a proper balance between investment in agriculture and industry as both are complementary, and an increase in agricultural production would cause an increase in industrial expansion because the products of the farms are raw materials to the industry. Therefore, if there is expansion in industry, employment is created and the income earned would partly be spent on food stuffs, translating that supply of food must consequently be increased, while supply of raw materials would also increase with industrial sectors' expansion. However, since Nigeria's circumstance at present manifests increasing (although below recommended threshold) public agricultural expenditure without a commensurate agricultural productivity in contrast to balanced growth theory, coupled with the lack of empirical studies which investigated agricultural productivity in a disaggregated manner,

it is imperative to investigate the effect of public expenditure on agricultural productivity in Nigeria.

1.2 **Statement of the Problem**

Nigeria is recognized as a predominantly agrarian economy that is heavily relies on its agricultural sector for food security, employment generation, and economic growth (World Bank, 2020). Government agricultural expenditure emerges as a central policy instrument in addressing the challenges faced by this sector and unlocking its potential for sustainable growth (Adeola & Evans, 2020). Through budgetary allocations, subsidies, and investment programs, the government aims to enhance agricultural productivity, promote value addition, and ensure food security for the growing population (FAO, 2018). However, the effectiveness of such expenditures in achieving these objectives remains a matter of contention.

Debate in the literature the relationship between expenditure and agricultural output is obviously bifurcated: while some scholars argue that increased government spending can catalyze agricultural development by improving access to inputs, technology, and infrastructure (Akinlo & Adebayo, 2015), others highlight persistent inefficiencies, corruption, and policy bottlenecks that hamper the translation of expenditure into tangible productivity gains (Ajakaiye et al., 2018). Against this backdrop, a deeper understanding of the relationship between government agricultural expenditure and productivity outcomes is imperative for designing evidence-based policies and interventions that foster inclusive and sustainable agricultural development in Nigeria. This understanding is crucial not only for addressing the immediate challenges faced by the agricultural sector but also for ensuring its long-term viability and contribution to national development goals (IFAD, 2019).

Furthermore, as Nigeria continues to default in complying with 2003 Maputo Agreement which requires 10% budgetary allocations to agriculture and UN's Food and Agricultural Organisation (FAO) recommendations in 2013 and 2015 which require 25% budgetary allocations to agriculture, the accompanying consequences are continually harmful to agricultural productivity as Nigeria struggles with inadequate/unavailability of agricultural equipment like tractors, ridges, ploughs, and so on. Not only this, lack of sufficient agricultural expenditure can also manifest in form of failure to provide services like agricultural extension services, credit, research and development (R&D), and control of plant and livestock diseases. This will in turn lead to food insecurity, shortage of food production, hunger, food inflation, cut in employment, shortfall in raw materials supply to industries, stunted economic growth; also, agricultural import will not subside but progresses annually, leading to outflows of forex and decrease in value of domestic currency (Naira).

Additionally, even though many scholars have delved into investigating the effect of agricultural expenditure on the productivity of agriculture, there is obviously no consensus, yet on what the relationship is between agricultural expenditure and output of agricultural sector as the results of existing studies are mixed, with some scholars reporting positive relationship while others recorded negative relationships. Not only this, as the scale of agricultural expenditure differs across the countries of the world, there is an ample room for more empirical studies to explore this subject matter. Also, what is actually popular in the literature are studies investigating the effect of agricultural expenditure on aggregate agricultural output, making it difficult to compare how expenditure affects each of the components of agriculture in Nigeria for policy actions. Nigeria's agricultural sector is divided into four components: crop production, livestock production, forestry production and fish farming production (Central Bank of Nigeria, 2023), and expenditure may affect each of these components of agriculture differently, thereby requiring

study that disaggregates the agricultural output into the main component parts while examining the effect of agricultural expenditure. Hence, this study filled the foregoing gaps by examining the effect of agricultural expenditure on the disaggregated agricultural output in Nigeria from 1999 to 2023.

1.3 Objectives of the Study

The study generally aims to examine the effect of government agricultural expenditure on agricultural productivity in Nigeria. However, the study specifically aims to:

i. Examine the effect of government agricultural expenditure on crop production in Nigeria;
ii. Evaluate the effect of government agricultural expenditure on livestock production in Nigeria;
iii. Investigate the effect of government agricultural expenditure on fish farming production in Nigeria;
iv. Assess the effect of government agricultural expenditure on forestry production in Nigeria; and
v. Analyze the effect of government agricultural expenditure on aggregated agricultural productivity

1.4 Research Questions

The study raised the following questions in order to achieve the objectives of the study:

i. What is the impact of government agricultural expenditure on crop production in Nigeria?
ii. How does government agricultural expenditure affect livestock production in Nigeria?
iii. To what extent does government agricultural expenditure affect fish farming production in Nigeria?
iv. What is the effect of government agricultural expenditure on forestry production in Nigeria?
v. How does the government agricultural expenditure affect aggregated agricultural productivity

1.5 Research Hypotheses

The study is anchored on the following hypotheses:

i. **H01**: Government agricultural expenditure has no significant effect on crop production in Nigeria;
ii. **H0**2: Government agricultural expenditure has no significant effect on livestock production in Nigeria;
iii. **H0**3: Government agricultural expenditure has no significant effect on fish farming production in Nigeria;

iv. **H0**4: Government agricultural expenditure has no significant effect on forestry production in Nigeria; and

v. **H0**5: Government agricultural expenditure has no significant effect on aggregated agricultural productivity in Nigeria.

1.6 Significance of the Study

Understanding the relationship between government agricultural expenditure and productivity is imperative for policymakers, agricultural stakeholders, and development practitioners due to several compelling reasons. Firstly, agriculture remains the primary source of livelihood for a significant portion of Nigeria's population, particularly in rural areas where poverty rates are highest (IFAD, 2019). As such, any policies or interventions targeting agricultural development have far-reaching implications for poverty reduction and rural livelihood enhancement.

Secondly, Nigeria faces persistent challenges in achieving food security and self-sufficiency despite being endowed with abundant arable land and natural resources. The effectiveness of government agricultural expenditure in addressing these challenges directly impacts the country's ability to ensure adequate nutrition for its population and mitigate the risk of food insecurity (FAO, 2018). Moreover, agriculture plays a crucial role in driving economic growth and development, contributing significantly to Nigeria's GDP and providing employment opportunities along the agricultural value chain (World Bank, 2020). Thus, understanding how government spending influences agricultural productivity is essential for maximizing the sector's contribution to overall economic development and diversification. Empirical evidence on the impact of government agricultural expenditure can inform the design and implementation of more targeted and effective policies and programs. By identifying the drivers of productivity and

the mechanisms through which government spending influences agricultural outcomes, policymakers can prioritize investments in areas with the highest potential for impact and address systemic bottlenecks hindering productivity enhancement (Akinlo & Adebayo, 2015). Additionally, enhancing agricultural productivity is closely linked to broader sustainable development goals, including environmental sustainability and climate resilience. Given the vulnerability of Nigeria's agriculture to climate change and environmental degradation, ensuring that government expenditure aligns with sustainable agricultural practices and resilience-building measures is critical for long-term food security and environmental sustainability (FAO, 2018).

Therefore, research on the relationship between government agricultural expenditure and productivity in Nigeria holds significant implications for poverty reduction, food security, economic development, and sustainable resource management. By filling the existing gap in empirical evidence and providing actionable insights, this research can contribute to more informed policy decisions and ultimately foster inclusive and sustainable agricultural development in Nigeria

1.7 Scope of the Study

This study's main focus is on examining how government agricultural expenditure affects Nigerian agricultural productivity in a disaggregated manner. As a result, the study will cover the 26-year period between 1999 and 2024. The government's expenditure patterns and the specific effects that this expenditure has on each subsector's output within the Nigerian economy are the main concern of this study. The available data served as the basis for choosing this study period.

1.8 Chapter Overview

This chapter consists of eight subcomponent parts which set the foundation for this study by providing a brief but solid background of the need for this study and the importance of agricultural output and public agricultural expenditure; the chapter consists statement of problem, where the gaps to be filled by this study are identified; objectives were stated as a follow up to the statement of problem; research questions to address the stated objectives were raised, while research hypotheses which are guessed statement to be tested for acceptance or rejection in line with the stated objectives were stated; significance of the study which highlights why the implications of agricultural expenditure on agricultural output in Nigeria are worth the committed time and effort, while at the same time underscoring the beneficiaries of the output of the study. Also, the this chapter is concluded with the coverage of the scope of the study which enumerates the definite borderline in terms of timing and context within which this study is being conducted.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Overview of Agriculture in Nigeria

Over the years in Nigeria, agriculture was the leading sector of the economy in 1950s and 1960s. For these periods, agricultural output accounted for 63 and 54 percents of GDP respectively (Aigbokhan, 2001) despite the reliance of Nigerian peasant farmers on traditional tools and indigenous farming methods. However, with the advent of oil in the 1970's, the percentage contribution of the agricultural sector to GDP has been falling persistently. Literature abound that stagnation in agricultural production accounts for the economic failure facing Nigeria while acceleration in agricultural productivity is the key explanation to industrialization in the developed countries (Lopez, 2004 cited in Ckiezie, 2020). The negligence of agricultural sector by the Nigerian government and the total dependence on a mono-cultural economy based on oil is the root of the crises faced in the Nigerian economy.

In the 1960s before the oil boom, agriculture sector constituted more than 75% of the total foreign exchange earnings and job opportunities for the Nigerian citizens was about 65% of the gross domestic product (GDP). The sector also accounted for about 50% of the national revenue (FRN, 2000). However, after the independence in the 1960, the role and contribution of agriculture sector in the country began to diminish. The decline was due to the discovery of oil in large quantity and the dominance of the crude oil sector in the national economy. The sectorial contribution of agriculture to overall economic growth was about 50 per cent in 1970 and 34 per

cent in 2003 (Central Bank of Nigeria 2003). As at 2011, agriculture accounted for 40.2 per cent of the GDP.

The downturn of the agricultural industry in Nigeria has its roots in the 1970s, when petroleum production started to dominate the economic landscape. The sector's share in GDP, which hovered around 60% during the nation's independence in 1960, dwindled to roughly 25% between 1975 and 1979. While there was a modest upswing between 1979 and 1982, this was not adequate to keep pace with the yearly population increase of 3.4% (Wujat, 2015). Despite agriculture's significance within the Nigerian economy, the nation has leaned heavily on imported goods for its agricultural needs, creating a negative trade balance. From 2010 to 2018, Nigeria's import expenditures on agricultural commodities amounted to a staggering total of US$231,550,000 (CBN, 2018). In a nutshell, the agricultural domain in Nigeria has grappled with issues like diminished efficiency, lack of sufficient funds, and a strong dependency on imported goods. Its performance has been influenced by several factors, such as limited utilization of contemporary farming techniques, inadequate capital investment, and the overpowering presence of the oil sector (Nelson et al., 2023).

Even though agriculture sector no longer accounts for about 50 per cent of the national gross domestic product (GDP) and in foreign exchange earnings due to phenomenal growth in the petroleum sector of the economy, agricultural sector is still dominating the centre of economic activityin terms of job opportunities and linkages with the rest of the sector within the Nigeria economy (Nigerian National Planning Commission, 2004). Chigbu (2000), stated that, despite the fact that agriculture accounts for one-third of GDP, it still remains the only sector in the Nigerian economy that employs majority of Nigerian populace.

The major problem that hinders the growth of Nigerian agricultural sector is the lack of favourable conditions for full integration of agricultural mechanization. The sector is still structured with the traditional method of production which has remained the same since independence (Ukeje, 2005). According to the National Planning Commission, (2004) the United Nations Food and Agriculture Organization rates agriculture productivity in Nigeria as low to medium but with medium to good productivity if the sector is efficiently managed. To be effective and attain higher level of productivity and growth in the agricultural sector there is a need to find how well the sector has been funded over the years and what effect has this produced on the overall productivity of the sector.

2.1.2 Overview of Agricultural Policies in Nigeria from 1999

Considering the pivotal role of agriculture in Nigeria, it is important to review polices that have shaped agricultural landscape in Nigeria as follows:

(a) National Economic Empowerment and Development Strategy (NEEDS)

Needs was initiated by Gen. Obasanjo in 1999. The key element of this development strategy includes poverty eradication employment generation, wealth creation, and value re-orientation. NEEDS provided help to agriculture, industry, small and medium scale enterprise and oil and gas. It set up a series of performance targets that government wanted to achieve by 2007. These include 6% annual growth in agricultural GDP of USD 3 billion per year on agricultural exports and 95% self-sufficiency in food. NEEDS offered Farmers improved irrigations, machinery and crop varieties which would help to boast agricultural productivity and tackle poverty head on, since half of Nigeria's poor people are engaged in Agriculture. Its activity with states SEEDS would help to implement integrated rural development programme to stem rural-urban migration.

NEEDS differ from other reforms by its participatory process that will ensure ownership, sustainability, encompassing scope, coordination, attractiveness problem solving and achievement oriented. NEEDS/SEEDS has been commended for bringing about cordial relationship between Federal and State level planning.The plan enumerate strategic roles for the private sector in agriculture.

(b) National Social Programme on Food Security (NSPFS)

Launched in all the 36 states of the federation in 2002 by Gen.Obasanjo. The broad objectives of the programme was to increase food production and eliminate rural poverty. Other specific objectives of the programme were assisting farmers in increasing their output, productivity and income, strengthening the effectiveness of research and extension service training and educating farmers of farm management for effective utilisation of resources; supporting government efforts in the promotion of simple technology for self sufficiency.

(c) Root and Tuber Expansion Programme(RTEP)

Initiated in 2003 under Olusegun Obasanjo's administration to cover the26 states in the Federation aimed at addressing the problem of food production and rural poverty. At the local farmers' level, the programme hopes to achieve economic growth, improve access of the poor to social services and carryout intervention measures to protect poor and vulnerable groups. At the national level, the programme was designed to achieve food security and structure demand for cheaper stable food such as cassava garri, yam, potato, etc, as against more expensive carbohydrate such as rice. Small holder farmers with less than two hectares of land per household were the targets of the programme while special attention is being paid to women who play a significant role in rural food production, processing and marketing. RTEP also targets at

multiplying and introducing improved root and tuber varieties to about 350,000 Farmers in order to increase productivity and income.

2.1.3 Recent Agricultural Policies in Nigeria

During the Umaru Musa Yar'Adua administration, he made food security and agriculture one of his seven point agenda. At the inception of his administration, he earmarked on a seven-point agenda so that the nation can move forward and be among the 20 largest economies by the year 2020. This also led to the ambitious vision 20:20 – a twenty-year plan for Nigeria. Like the Obasanjo administration (1999 – 2007), the thrusts of the policy direction for agriculture, and food security within the seven point agenda includes:

- Creating the conducive macro-environment to stimulate greater private sector investment in agriculture.
- Rationalizing the roles of the tiers of government in their promotional and supportive activities to stimulate growth.
- Reorganizing the institutional framework for government intervention in sector to facilitate smooth and integrated development of agricultural potentials.
- Increasing agricultural production through increased budgetary allocation and promotion of the necessary developmental, supportive and socio-oriented activities to enhance production and productivity and marketing opportunities.
- Promoting increased use of machinery and inputs through favourable tariff policy, etc**.**

Arising from the redefined role of the federal government, it thrust of activities will be directed to obviate the technical and structural problem of agriculture on the following aspects:

development activities, animal vaccine production, veterinary drug manufacture, agro chemical manufacture, water management, agricultural development, input supply, distribution, credit and macro-credit (available at www.noveltyjournals.com).

The Jonathan administration came up with Agricultural Transformation Agenda (ATP) anchored by the then Minister of Agriculture, Mr. Akinwumi Adesina (Agricultural Expert). Their policy thrust focuses on supplying fertilizers directly to the rural farmers and not through middle men, provided seeds with high yield directly to small holding farmers, provided telephones to the rural farmers for ease of communication and encourage value chain in such a way that agric product are being processed locally to finished products for export. The regime further has the programme of providing storage facilities and exporting perishable goods such as tomatoes, etc, by the provision of infrastructure such as perishables shed at major airports in Nigeria. The youth empowerment in agriculture programme was also initiated by this regime**.**

The succeeded administration led by Muhammadu Buhari pledged to continue the agricultural polices of the past regime, improve on seed yield and fertilizer distribution, emphasizes export and make agriculture a business by mechanization, the value chain of transformation, marketing and also funding research institutes. The regime also continues on implementing the policy thrust of youth empowerment in agricultural programme (YEAP). So far about 30,000 youth have been empowered. This administration earmarked on a school feeding programme. A plan model adopted from Brazil national smart agricultural school feeding programme. Brazil School feeding programme is second only to that of the United States of America in size and depth; 40million school children are fed daily at an estimated annual cost of 2 billion USD, shared by Federal, State and Local Council, communities and private sector (www.fmard.gov.org.). The Nigeria government is interested in how to increased productivity and yield of small holders

farmers using cooperative model and technological advancement. Brazil has achieved self sufficiency in rice production and export 20% of her rice to more than 65 other countries.

Another agricultural policy thrust of the Buhari administration is the Anchor Borrowers programme designed to assist small scale farmers to increase the production and supply of feedback to agro-processors. The CBN has set asideN20 billion from the N220 billion micro, small and medium enterprises development fund (MSMEDF) for farmers at single-digit interest rate of nine percent. Implementations are hinged on three pronged approach. These are out-grower support programme, training of farmers, extension workers and bank as well as risk mitigation (Leadership Newspaper, 2015).

2.1.4 Agriculture and its Importance

Agriculture is the science or practice of farming, including the cultivation of the soil for the growing of crops, the rearing of animals to provide food, and the preparation and marketing of agricultural and agro-allied products for welfare maximization and economic development of Nigeria. Agriculture encompasses a wide variety of specialties and techniques, including ways to expand the lands suitable for plant cultivation, by digging water channels and other forms of irrigation. Cultivation of crops on arable land and the pastoral herding of livestock on rangeland remain at the foundation of agriculture.

Various people have defined Agriculture in different ways but common among these definitions is the fact that it is the production of food, feed, fiber, and other goods by the systematic growing and harvesting of plants and animals (Adamu, 2018). Akinboyo (2008), defined agriculture as the science of making use of land to raise plants and animals. It is the simplification of natural food webs and the rechanneling of energy for human planting and animal consumption.

According to Allen (2000), agriculture was the key development that led to the rise of human civilization, with the husbandry of domesticated animals and plants (i.e., crops) creating food surpluses that enabled the development of more densely populated and stratified societies.

Ikala (2010) has described agriculture as the profession of the majority of humans that involves farming, fishing, animal husbandry, and forestry. In its broadest sense, agriculture comprises the entire range of technologies associated with the production of useful products from plants and animals, including soil cultivation, crop and livestock management, and the activities of processing and marketing (Allen, 2000).

According to Fashola (2013), agriculture is that kind of activity that joins labour, land or soil, live animals, plants, solar energy, and so on. Yusuf (2014), defined agriculture as a way of life that involves the production of animals, fishes, crops, and forest resources for the consumption of man and supplying the agro-allied product required by other sectors. It is seen as the inherited and dominant occupation employing about 70% of Nigerians. Though subsistence agriculture is practiced in this part of the world, it will not be an overstatement to say that it is the life wire of the economies of developing countries.

This work adopts Ahmed's (2013) definition of agriculture as its working definition. It is encompassing as it involves not only the cultivation of crops for man's consumption but also, the conversion of these raw materials (farm produce) by agricultural manufacturing firms into finished goods and services that have better utility at satisfying human wants and desires. It also involves extensive research training of farmers on the use of improved seedlings and better technological equipment to boost crop yields for the economic development of Nigeria.

On the importance of agriculture, agricultural sector's impact on GDP, food and nutritional supplies, job creation, income and wealth creation, and foreign exchange revenues cannot be overstated. Despite the agricultural sector's enormous contribution to Nigeria's economic growth, it has received less attention since the discovery of oil (Najira et al., 2022).

Moreover, adequate increase in government spending in agriculture will boost economic growth. It is important to note that if necessary attention is paid to agriculture and the needed investment made to develop the sector, and its potentials fully harnessed, there will be massive employment opportunities, poverty alleviation, food security, guarantee amongst other things alternative source of foreign exchange and all these will place the economy on the part of recovering (Chiekezie et al., 2020),

In addition, agriculture is a very important sector in the Nigerian economy as it is the country's major source of food. That notwithstanding, the support given to agriculture in terms of allocation has not been encouraging when comparing it to other sectors like mining, manufacturing, and oil (Igweze-Ekwunife, & Okpala, 2022)

Also, agriculture contributes immensely to the economic development in Nigeria, efficient and effective management of the sector will enable the country to feed its increasing population, provide job opportunities, foreign exchange earnings and the provision of raw materials for the industries. However, due to policy and agriculture expenditure inconsistency coupled with political instability the sector has not been performing up to its expectation (Falana, 2021)

The principal source of employment for substantial sectors of the population in most emerging countries, as well as the key to the countries' long-term economic growth has been an issue of discussion (Agbana & Lubo, 2022). Also, agriculture plays multiple functions in an economy,

including supplying food, driving economic growth through increased productivity, and promoting poverty reduction in some cases (**Sen, 1999**). In the context of Nigeria, the farming industry has traditionally been tasked with multiple objectives, including nourishing an expanding populace, earning foreign currency, generating job opportunities, and supplementing the incomes of agricultural households (Nelson et al., 2023).

According to Alabi and Abu (2023), a well-managed public spending in agriculture can be used to provide rural infrastructure such as road that will link farmers to markets. Public financial resources will enable farmers to access agribusiness credit and storage facilities to reduce their estimated 50% post-harvest losses (Oguntade, 2014). These resources are important to boost agricultural productivity, which can accelerate economic growth, raise incomes, and improve standards of living.

2.1.5 Government Agricultural Expenditure

Government spending refers to money spent by the public sector on the acquisition of goods and provision of services such as education, healthcare, social protection, and defense (Okeke, 2002 cited in Utitofon et al., 2022). Government spending is financed primarily through two sources - Tax collections by the government, which could be Direct or Indirect taxes, and Government borrowing (borrowing money from its citizens or borrowing money from foreigners) Public spending enables governments to produce goods and services or purchase goods and services needed to fulfill the government's economic objectives. Government spending could be current or capital spending. Current spending is for the short term and includes expenditure on wages and raw materials, while Capital spending is for the long term and does not need to be renewed each year (Utitofon et al., 2022)

Government expenditure is referred to expenditure on infrastructure which include transportation and communication that brings about reduce the cost of production through increased private sectors investment and profitability of farms thus, fostering economic growth (Ebiringa and Charlse, 2012). Government expenditure as observed by Babalola et al. (2015), is the expenses that a government incurs for its maintenance, society, and the economy as well as for helping other countries. Government expenditure represents the total government spending to attain the predetermined macro-economic objectives. Governments have recorded a continuous increase over time in almost every country. Government expenditures include administration, defense, justice, law and order, and maintenance of the state which are considered unproductive (Bhatia, 2002). Expenditures on defense, education, agriculture, transportation and communication, and such are all the non-transfer expenditures.

According to Gukat and Ogboru (2017) government expenditure is the costs that are usually incurred by the government for the provision and maintenance of itself as an institution, the economy, and society. They further stated that government expenditures usually tend to increase with time as the economy becomes large and more developed or as a result of an increase in its scope of activities. Gukat and Ogboru (2017) classified government expenditure into recurrent and capital expenditure as the major components of government budget in an economy. It is sometimes referred to as a revenue budget and it covers recurrent items or expenditures while the capital expenditure budget has to do with expenditures necessary for capital assets procurement. The study defnes government based on the emphasis on government expenditure components which include capital and recurrent spending in the agricultural sector. The expenditure is spread among the two constituents for the production of food crops in Nigeria and thus, the variables formed part of the study.

Government expenditure on agriculture is the allocation of fund to the agricultural sector in order to boost agricultural production and output thereby promoting economic growth. Government expenditure on agriculture comprises expenses on sector policies and programmes, constructions of flood control, irrigation and drainage system, operation or support of extension services, pest control services, crop inspection services, provision of grant and subsidies to farmers. The objectives and strategies of the federal agricultural expenditure include: creating enabling environment for agricultural activities, government intervention in agricultural sector, increase budgetary allocation on agriculture, etc.

Also, government expenditure on agriculture refers to the total financial resources allocated or spent by the government on the agricultural sector with the objective of enhancing productivity and output. As a critical component of socioeconomic investment, public spending in this sector aims to drive agricultural development and economic sustainability. In Nigeria, Nosike et al. (2019) define government agricultural expenditure as the total funds disbursed to achieve planned budgetary objectives for the sector. Atayi et al. (2020) further emphasize that such expenditure encompasses all government financial commitments toward agriculture, covering various aspects such as crop gene banks, livestock management, agricultural research, technological advancements, and extension services (Mogues et al., 2018).

Keji et al. (2020) assert that government spending on agricultural growth is defined as budgetary allocations specifically directed toward increasing agricultural output. This includes initiatives such as the development of improved crop varieties, seed production and distribution, the acquisition of fertilizers and mechanized farming equipment, and investments in agricultural research and development. These expenditures play a crucial role in fostering economic expansion by enhancing sectoral productivity and sustainability.

Matthew et al. (2016) who were cited in Christopher et al, (2025) highlight that government expenditure on agriculture is derived from various levels of governance local, regional, and national and encompasses costs associated with new crop development, seed production, fertilizer procurement, mechanized farming, pest and disease control, environmental protection, irrigation projects, and agricultural research. Additionally, international organizations, particularly the World Bank through its Agricultural Development Projects (ADP), contribute significantly to public agricultural investments.

Public spending on agriculture is instrumental in driving economic progress by addressing food security, increasing raw material production, enhancing foreign exchange earnings, and supporting small-scale agricultural enterprises. Targeted investment in agricultural productivity not only meets the rising demand for food and consumer goods but also serves as a catalyst for broader economic development in Nigeria. Effective and well-managed agricultural expenditure is therefore essential for sustaining long-term growth and enhancing national economic resilience (Christopher et al., 2025).

In addition, Chiekezie et al. (2020) opine that government expenditure is an important policy instrument utilized by government for improving infrastructure, technology, human capital development, and promoting economic growth and equitable distribution. In developing countries, government expenditure is the main instrument of promoting economic growth which essentially is fundamental to agricultural development. Government expenditure on agriculture plays a very important role in agricultural productivity and development (Duong & Izumida, 2002). The provision of credit has been adjudged as a critical resource in the advancement of the agricultural sector. However, access to government agricultural loan facilities has been seriously incapacitated in Nigeria (Swinnen & Gow, 1999). Limited government credit facilities constrain

farmers thus imposing a high cost on the society. This is in terms of rural unemployment, rural poverty, and distortion of production and liquidation of assets.

A study carried out by International Food Policy and Research Institute (IFPRI) and the World Bank in 2008 as cited in Aina and Onojola (2017) revealed that Nigeria's public expenditure on agriculture is less than 2% of total federal annual budget expenditure. This is significantly low compared to other developing countries like Kenya (6%), Brazil (18%) and 10% goal set by African leaders' forum, under the comprehensive Africa Agricultural Development Programme (CAADP).

According to Chiekezie et al (2020), efforts have been made by successive governments over the years in Nigeria toward enhancing government agricultural expenditure aimed at addressing food production challenges but this has been hit by dwindling government revenues resulting from oil price fall. _is has given rise to the allocation of meager resources to boost agricultural production which contravenes the Maputo declaration of 10% annual budgetary allocation for agriculture where Nigeria has consistently allocated less than 5% for agriculture in recent years. Notably, Nigeria spent 5.41%, and 5.38% of its annual budget on agriculture in 2008 and 2009 but, declined to 2% in 2018 and 156% in 2019 respectively (Oxfam Nigeria, 2021). By 2020, agricultural expenditure was

2.1.6 Overview of the Nigerian Agricultural Output

The essence of engaging in any economic activity is to produce a particular product or output. It is also for this reason that people involved in agricultural activities. Therefore, agricultural output refers to the products of economic activities and this includes production, livestock, forestry, and fishing (CBN, 2019). Olabanji et al. (2017) defined agricultural output as the value

of agricultural products which, free of intra-branch consumption, are produced during the accounting period and before processing, are available for export and consumption. According to OECD (2020), the agricultural output comprises output sold (including trade between agricultural holdings); changes in stocks; output for own final consumption; output produced for further processing by agricultural producers;

and intra-unit consumption of livestock feed products. Agricultural output is the quantity of

Agricultural Expenditure and Agricultural Productivity products or goods produced in the course of cultivation of crops and rearing of animals in a given period (Ekine, 2018). Agricultural output growth is therefore the positive change in the agricultural output of an economy. It is an increase in the capacity of the agricultural sector of an economy to produce goods, compared from one period of time to another (World Bank, 1999).

Agricultural output can be broadly seen as the output or end products people reap from the series of agricultural activities in which they involve (Adamu, 2018). Nigerian agriculture has produced a great output over the years which have been instrumental to both the country itself and the international community. According to Babalola (2015), Nigeria led the world in the production and export of agricultural output like cocoa, palm produce, groundnuts, rubber, and timber. CBN (2012) grouped agricultural output into four categories; crop production is the cultivation of plants both on land and in riverine areas. Broadly, these crops are grouped into cereals, roots and tuber, vegetable, pulses and nuts, fruits and sugars, vegetables and spices, and forest crops (Babalola, 2015); Fishing refers to the water products gained by involving in fishing activities; Livestock entails the rearing of animals for both consumption and commercial purpose while

forestry involves the raising of tree products which are commercially harvested for income generation.

The performance of the agricultural sector in Nigeria has metamorphosed from high to low significance due to the dominance of the oil sector. Prior to the discovery of oil, the agricultural sector contributed about 63.5% to real gross domestic product, but this declined steadily to about 23.5% in 1977 after the discovery of oil. More so, the non-oil sector (led by the agricultural subsector) contributed about 100% to the total federally collected revenue in 1960, but this declined to about 24.4% in 1977, while the oil sector contributed about 75.6% in the same year. The decline in performance of the agricultural sector was accompanied by consequences of food insecurity, loss of agricultural employment opportunities, and a decline in industrial performance due to an inadequate supply of basic agricultural materials, among others. The essential need to address the fallout from the collapse of the agricultural sector necessitated different policy measures introduced by the different political administrations since the mid-1970s. These programmes include Operation Feed the Nation (OFN), introduced in 1976, the River Basin Rural Development Authorities, from 1976, the Agricultural Credit Guarantee Scheme Fund, introduced in 1978, the Green Revolution Programme, from 1980, and various World Bank Agricultural Development projects in different regions of Nigeria in the period from 1974 to 1982, such as projects at Funtua (1974), Gombe (1974), Lafia (1977) and Oyo North (1982), among others.

In addition, the agricultural sector has witnessed recent policies, such as the commercial bank credit scheme in 2009, the agricultural transformation agenda (ATA) in 2011, the anchors' borrowers programme in 2015 and the establishment of the agricultural promotion policy, also known as the Green Alternative, in 2016. Therefore, it can it is safe to affirm that agricultural

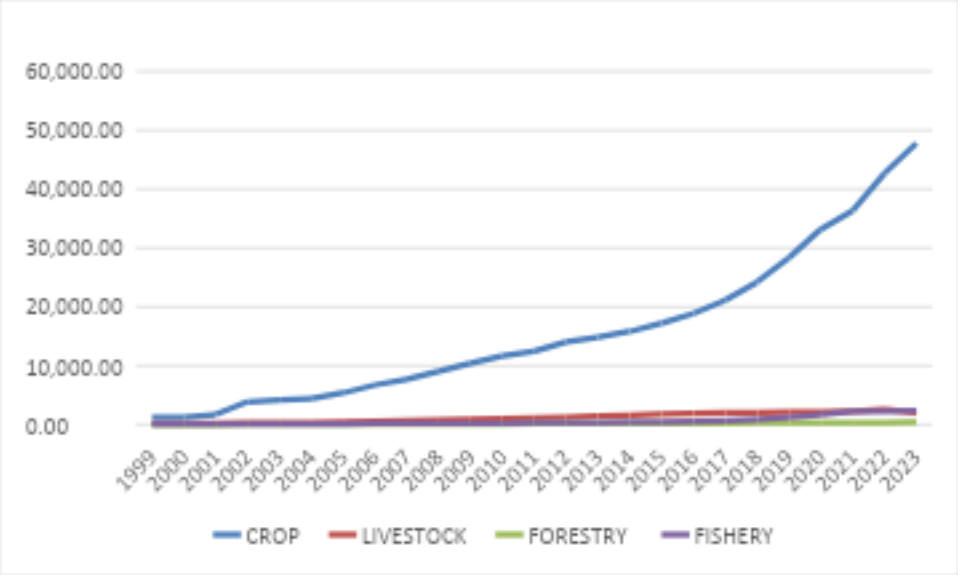
sector has witnessed remarkable policy changes since the Nigerian vision 20:2020 (NV 20:2020) was launched in 2009. The first implementation plan (2010 – 2013) was ongoing when the agricultural transformation agenda (ATA) came on stream in 2011 and lasted until 2015. In august 2016, the agriculture promotion policy (otherwise known as the Green Alternative) was launched. As the nation experienced these different phases of strategic plans there has been no systematic framework of reviewing the performance of the sector to provide evidence-guide policy decisions and development strategies (Olamola & Moques, 2018). A regular review is required for proper planning, identification of priorities and setting of targets not only to achieve meaningful transformation of the sector but also to synchronize the sector's development with the nation's medium and long-term development objectives.

These policies blueprints together provide insights on national priorities in agriculture, guiding policies, policies strategies, and responsibilities of the Federal, State, and Local governments in delivery public agricultural goods and service. Budgetary allocation to agriculture compared with other key sectors is also low despite the sectors role in the fight against poverty, hunger, and unemployment, and in the pursuit of economy development (Olamola & Moques, 2018). Governments spending on health, infrastructure, and education also have replicated effects on the performance of the agricultural sector; this is stemmed from the fact that the health of the farmer and literacy level go a long way in improving the farmer productivity. Therefore, the share of government expenditure on agriculture in total government spending can be taken as an indicator to measure how much attention the government gives to the sector. In spite of the above policy initiatives, Agricultural productivity has fluctuated widely and productivity has declined. The contribution of the agricultural sector to real gross domestic product is still largely unimpressive, as the sector contributed only about 25.1% to real GDP in 2018, while the oil sector still

dominated (Nwosa, 2021). Despite these efforts, agricultural production has remained far behind population growth resulting in high food insecurity effects in Nigeria as the available statistics from the Central Bank of Nigeria (CBN) shows that the agricultural sector's share of GDP increased from 28% in 1985 to 32% in 1988, dropped to 31% in 1989, rose to 37% in 1990 but fell significantly to 24 percent in 1992, it increased again to 37% in 1994. It was 32% in 1996 and rose to 40% in 1998, dropped again to 27% in 2000, increased to 37% and fell to 31% in 2002 and 2006 respectively. The percentage contribution of the agricultural sector to GDP fell persistently from 0.37 in 2009 to 0.22 in 2012 and to 0.20 in 2014 (Matthew & Mordecai, 2016). In addition, the sector only contributed 23.1% and 25.2% to GDP in 2015 and 2019 with the only 40% of the arable land cultivated (NBS, 2020 cited in Najira et al. 2022).

Furthermore, between 1999 and 2023 agricultural output has witnessed downward trends. Considering figure 2.1, it is obvious that agricultural output has been at the stagnant trends from 1999 to date, save for crop production which maintains some upward stature among the four sub-sector within the agricultural sector in Nigeria.

Figure 2.1: Disaggregated Agricultural Output between 1999 and 2023



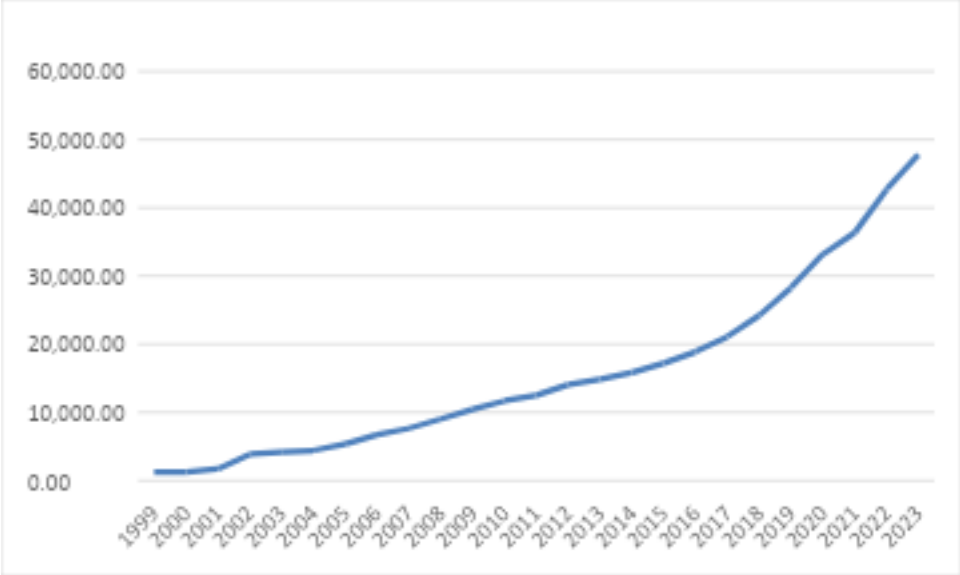
Source: Central Bank of Nigeria annual statistical bulletin, 2019.

Therefore, the country is yet to achieve food sufficiency and any meaningful economic growth and development as the situation has continued to worsen amid volatile government sources of revenue. Given that the welfare of many Nigerians, particularly rural dwellers are tied up to agriculture, a feasible future can only be guaranteed through effective government expenditure to improve food production. Since, studies revealed that an increase in agricultural government expenditure would enhance agricultural output levels, employment, food security, food prices, incomes, and overall socio-economic welfare. Hence, as conceived by this study, it is imperative to examine how public expenditure in agriculture has fared in terms of stimulating agricultural productivity.

2.1.6.1 Crop Production Subsector

The crop production subsector is arguably the largest subsector of the Nigerian agriculture sector as it account for 87.6% of the sector growth. According to CBN (2012), from 1960 – 2011, the crop production subsector, has remained the largest as its account for over 80% of the sectors GDP on the average. Odetola and Etumnu (2013) accorded giant stride to the peasant or small holder farmers who are engaged largely in the production of food staples such as rice, maize, beans, yam, etc, It was further stated that the subsistent farmer produced 90% of our food product produced within Nigeria. Two notable crops that Nigeria is known for in this subsector are rice and cassava. FAO (2018), rated Nigeria not only Africa's first in rice consumption but also ranks it among the largest if not the first in both production and importation of rice. Rice is the first major revenue earner to the farmers than any cash crop in the country. Empirics from FAO (2018), have shown that, production hit approximately two million metric tons during the year 2018 whereas importation dwarfed this number as the global champion in cassava farming. Several challenges have been identified as bottleneck to the sector, among which are: seasonality reliance, lack of fertilizer, shortage in extension services, low capital and financial exclusion of farmers, etc. As revealed by Figure 2.2, output of the crop production subsector has maintained some impressive upward movements from 1999 to date, suggesting that investment expenditure in this subsector might be yielding expected result.

Figure 2.2: Crop Production Output in Nigeria from 1999 -2023



Source: Central Bank of Nigeria annual statistical bulletin, 2019.

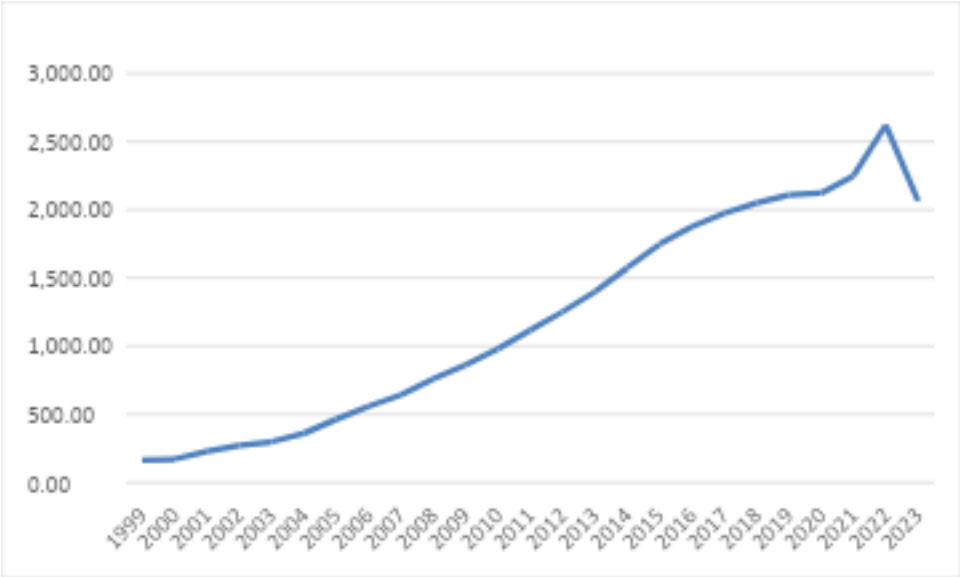
2.1.6.2 Livestock Production Subsector

The country's livestock profile from World Bank (2017) revealed that the livestock sub-sector has been growing at a rate of 12.7% higher than agricultural growth rate of 6.8% annually and it contribute 8.1% of the sector's total output. The sub-sector is real in socio-economic development and key to nutritional security, providing 26.5% of the proteins consumed by the populace in Nigeria. Majority of Nigerian livestock owners are the rural poor and a significant proportion of the urban poor as well, and evidence indicate that livestock development would positively contribute to poverty alleviation. Despite the herd size, apart from eggs, livestock subsector's production does not meet the current need. The difference between domestic demand and supply is projected to widen in future (World Bank, 2017). Nigeria currently imports more

than 70% of its poultry and 25% of its beef requirement to meet its domestic demand (World Bank, 2017). The northern region has the largest population of livestock in the country, about 90% of the country's cattle population and 70% of country's sheep and goat population (World Bank, 2017).

On the other hand, poultry is distributed across Nigeria with a greater concentration in the southwest and southeastern Nigeria. The livestock sector in Nigeria is highly exposed to a number of natural and humanly induced risk. Major risks include: (a) drought, which are increasing in frequency and intensity, have significant negative implications for pastoral communities; (b) insecurity and conflict especially in Northern Nigeria and Boko Haram insurgency, increase the fragility of pastoral community and livestock sub-sector, (c) pest and disease leads to high mortality and lower productivity, and (d) excessive rainfall and flooding hampered the performance of the sub-sector**.** Figure 2.3 also buttresses the fact that Nigeria as an agrarian country has been doing well from 1999 to 2021 in terms of increasing livestock production. However, in 2022 and 2023, there seems to be a reversal to downward trends, even when government is agitating for an increase budgeted expenditure to agriculture.

Figure 2.3: Livestock Production Output in Nigeria from 1999 -2023



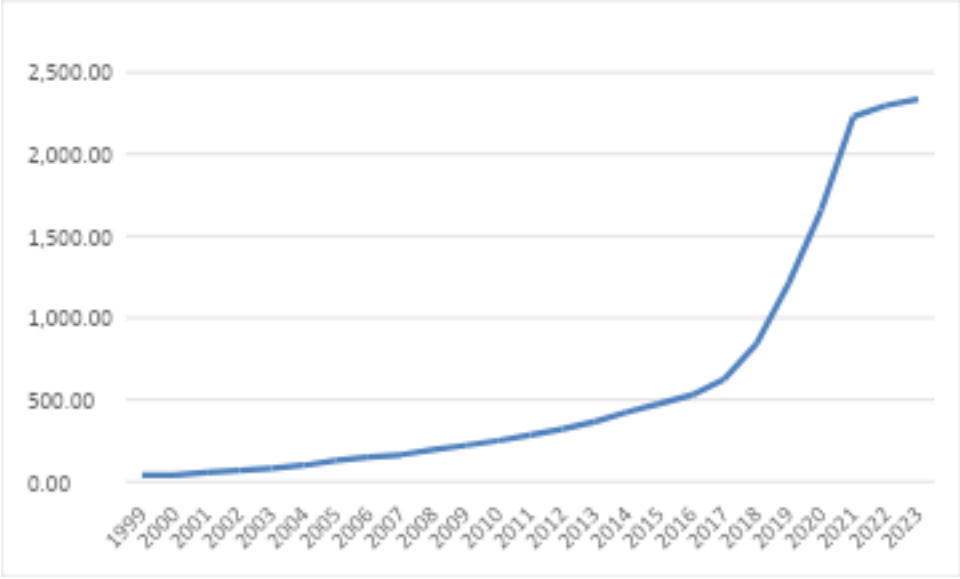
Source: Central Bank of Nigeria annual statistical bulletin, 2019.

2.1.6.3 Fisheries Production Sub-sector

According to FAO (2017), Nigeria is ranked 1st in sub-Saharan Africa in fisheries production and it contribution to the sector's total output was 3.2%. Its production was estimated at 21,700 tons during the year before the millennium but steadily increased to 316,700 tons in 2015. The FAO statistics further revealed that, an estimate of over a million tons of fishes were produced in the year 2015 out of which catches from marine and inland coastlines had 36% and 33% respectively whereas the remaining 31% was from aquaculture. Although the fishery subsector is a very good source of the proteins to Nigeria, however, it has remained at the bottom of the list in terms of its share to the GDP as it contributed only 0.5% in 2015. With a total bill of USD 284 million and USD 1.2 million for imports and exports respectively, Nigeria is regarded as a net importer of fish in 2013 (FAO, 2017). This is largely attributable to the fact that almost 80% of

the domestic production is generated by low-skilled, poor and subsistent artisan fishermen within the inland water ways as opposed to a high-tech, capital intensive aquaculture mode of production. Rondon and Nzeka (2010) as sited in Oyaklulowen and Zibah (2013) reported Nigeria's fish demand amounting to nearly $1.8 billion in 2009. The subsector is a major occupational hub particularly to the rural dwellers in the riverine area such as the Niger Delta region. As at 2018 (FAO) put the number of inland fishermen to be over 700,000 out of which 20% were women, whereas the Nigeria Fishery industry employs 490,000 in 1990, but as the millennium enters, employment increases to 1.1m, 1.4m, 1.5m in 2010, 2015, 2016 respectively (FAO, 2018). Looking at Figure 2.4, it is also clear that fishery production in Nigeria remains stagnant until 2004 when it began to rise a little why significant increase was experienced from 2007 to 2022 before a little bit of steep in 2023.

Figure 2.4: Fishery Production Output in Nigeria from 1999 -2023

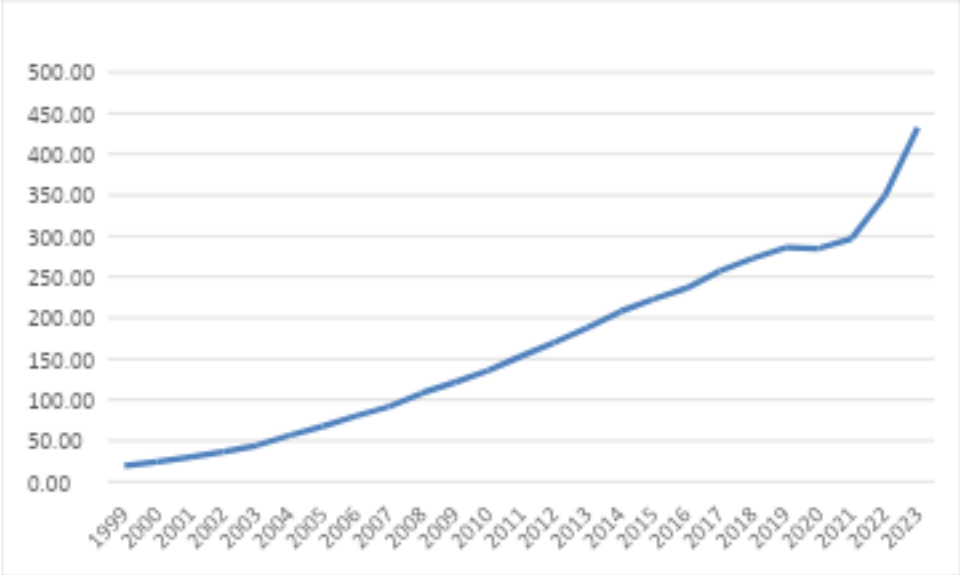


Source: Central Bank of Nigeria annual statistical bulletin, 2019.

2.1.6.4 Forestry Production Subsector

Forest is important in the sense that it houses pharmaceuticals, regulates the atmosphere as it neutralised the solar heat, protect the soil, provides wax, pulp, oils and other essential industrial input of economic value. But it contributes only 1.1% to the sector's total output (Benson et al., 2023). It is regarded as a national economic resource production. The trees found here, are not only a source of wood for our furniture or fuel in both the rural and semi-urban cities they are more importantly a primary source of inputs to the pharmaceutical industries. In Nigeria, there exists general reserves and national parks; a total of 32 and 7 general reserves and national parks, respectively with an estimated coverage of over a total of about 4 million as at the year 2000 (FAO, 2000). Additionally, Larinde and Chima (2018) reported that the Nigeria forest repository are: Olokemeji forest reserves, Gambian Forest reserve, Omo forest reserves Akure/Oofu Forest reserve, Idare Forest reserves, Ifion/Owo Forest reserves, Eba forest reserves, etc. Generally, there has been dull increase in the output of forestry agricultural sub-sector in Nigeria within the time scope of this study as shown by figure 2.5. Forestry did not experience increased output until 2004 in Nigeria, although there has been a slow-like increase. This is not acceptable for an agrarian country that is expected to be a net exporter of agricultural products in Nigeria.

Figure 2.4: Fishery Production Output in Nigeria from 1999 -2023



Source: Central Bank of Nigeria annual statistical bulletin, 2019.

2.1.7 Agricultural Expenditure and Agricultural Output

The relationship between government agricultural expenditure and agricultural productivity in Nigeria has been a subject of considerable scholarly inquiry. Akinlo and Adebayo (2015) contend that increased government spending on agriculture holds the promise of stimulating productivity growth by enhancing access to crucial inputs, infrastructure, and technology. They argue that such investments can bolster agricultural production by subsidizing inputs like fertilizers and seeds, improving irrigation systems, and providing extension services to farmers.

Additionally, investments in rural infrastructure, such as roads and storage facilities, can facilitate market access and reduce post-harvest losses, thereby contributing to overall productivity. Moreover, advancements in agricultural technology, supported by government research and development initiatives, can lead to increased efficiency and higher yields. This perspective underscores the potential positive impact of government agricultural expenditure on productivity enhancement.

Conversely, Ajakaiye et al. (2018) offer a contrasting viewpoint, emphasizing the prevalence of inefficiencies in the allocation and utilization of agricultural funds in Nigeria. According to their analysis, despite substantial budgetary allocations to the agricultural sector, the actual impact on productivity has been limited due to various challenges, including corruption, bureaucratic red tape, and mismanagement of resources. They argue that a significant portion of allocated funds is often lost to leakages, diversion, or inefficiencies in project implementation, diminishing the intended benefits. Furthermore, they highlight the fragmented nature of agricultural policies and programs, leading to overlapping mandates, duplication of efforts, and lack of coordination among stakeholders.

Consequently, these systemic challenges undermine the effectiveness of government agricultural expenditure in translating into tangible improvements in productivity. This perspective underscores the importance of addressing governance and institutional deficiencies to maximize the impact of agricultural investments.

The contrasting perspectives presented by Akinlo and Adebayo (2015) and Ajakaiye et al. (2018) highlight the complexity of the relationship between government agricultural expenditure and productivity in Nigeria. While the former emphasizes the potential benefits of increased

spending in enhancing agricultural inputs, infrastructure, and technology, the latter underscores the systemic challenges and inefficiencies that often impede the translation of expenditure into productivity gains. This divergence underscores the need for empirical investigation to discern the actual impact of government agricultural expenditure on productivity outcomes. By examining the empirical evidence and identifying the underlying mechanisms shaping this relationship, policymakers can gain insights into the efficacy of existing agricultural policies and programs, and formulate strategies to optimize the impact of government spending on agricultural productivity in Nigeria.

2.2 Theoretical Review

2.2.1 Wagner's Theory of Public Expenditure

This theory was propounded by Wagner (1883). The theory states that there is a tendency for a long-run relationship between state activities and national income growth. This implies a continuous relative expansion of public spending as a consequence of the development process. Therefore, as society advance in industrialization, the set of social, commercial, and legal relationships within it become more complex. In this case, the government plays a more prominent role in setting up and running institutions to control this complexity which causes an enlargement in the size of the public budget. Thus, in the initial stage of economy growth, the state finds out that it has to expand its activities quite fast in several fields like agriculture, education, health, civil amenities, transport, communications, security, and so on. Evidently, government expenditure has since witnessed an increase needed to manage and finance natural monopolies and ensure smooth operation of the market forces (Etale & Ayunku, 2015). Serena et

al. (2011) pointed out that such expenditure is expected to increase take off conditions that supports value addition to agricultural products in Nigeria.

Therefore, the inter-linage of all these facilities provided by the government smoothen operations of economic activities which enhance the real income per capita of the country (Ogboru et al. 2018). This theory is relevant to this study as it describes the reasons why government expenditure over time in Nigeria has been rising in a quest to increase food production for welfare maximization and income stability. Due to the progressive nature of economic development in Nigeria, government expenditure in the agricultural sector has been rising to meet up with the rising demand for food by the rising population.

Wagner argued that there is a functional relationship between the growth of an economy and the growth of government activities. As economies grow and industrialize, the demand for public goods and services increases. This is due to the complexity of a modern economy, which requires more regulation, infrastructure, education, and social services. As a result, government expenditure tends to grow at a faster rate than national output, leading to an increasing share of the public sector in the economy.

According to Wagner, social progress is the fundamental cause of the relative growth of government expenditure. As societies become more complex and citizens demand higher standards of living, there is an increased need for government intervention in various sectors such as education, healthcare, social security, and public infrastructure. This, in turn, leads to an expansion of government functions and, consequently, higher public spending.

Wagner's Law also implies that the government plays a crucial role in ensuring economic stability and addressing market failures. In the area of Economic growth, market imperfections,

externalities, and public goods become more prominent, necessitating government intervention. This intervention often takes the form of increased public expenditure on social services, infrastructure development, and regulatory oversight.

Wagner identified that the expansion of state functions occurs both intensively and extensively. Intensive expansion refers to the increase in government activities within existing functions, such as more spending on education or healthcare. Extensive expansion refers to the introduction of new government functions, such as environmental regulation or social welfare programs that were not previously part of the government's responsibilities.

The law particularly applies to industrializing economies, where the transition from an agrarian to an industrial economy leads to urbanization, increased economic complexity, and a higher demand for public goods. Wagner observed that in such economies, the government is often required to provide a broad range of services to support economic development, including infrastructure, legal systems, and social safety nets (Christopher et al., 2025)

2.2.2 Agriculture-Based Economic Development Theory

Agriculture Based Economic Development Theory was propounded by Wiggins in 2006. The theory postulated that an agricultural-based strategy for economic development requires a technical, institutional and financial- incentive change that will raise the productivity of small farmers. Wiggins explains that agricultural financial incentives can play a dual role in the process of agricultural development for economic transformation. Firstly, it will produce more food and also produce many great jobs needed. A higher level of investment (gross capital formation) should stimulate growth while agricultural productivity is expected to have a positive effect on aggregate economic growth. It has been observed by Zuberu et al. (2017) that countries at the

early stages of development depend almost fully on agricultural growth for employment, foreign exchange, government revenue, and food supply to the population. In this sense, agricultural growth is the key impetus to the growth of underdeveloped and developing countries (Uremadu & Onyele, 2016). This theory supports not only the funding of agricultural output by government and private individuals but also the investment in agricultural infrastructures which could facilitate the production of agricultural output and its linkage to other sectors/industries through the creation of added value for optimum utility maximization by citizens in Nigeria

2.2.3 Musgrave Theory of Public Expenditure Growth (1997)

Musgrave (1997) argued that what matters most for government spending is how effective it is. If the so called "productive" category of government spending is not effective, it can have a negative impact on growth. This theory was propounded by Musgrave as he found changes in the income elasticity of demand for public services in three ranges of per capita income. He posits that at low levels of per capita income, demand for public services tends to be very low, this is so because according to him such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education, transport and agriculture starts to rise, thereby forcing government to increase expenditure on them. He observes that at the high levels of per capita income, typical of developed economics, the rate of public sector growth tends to fall as the more basic wants are being satisfied.

2.2.4 Keynesian Theory of Economic Growth

Keynesians argue that increasing government expenditure boosts the economy (Dynan and Sheiner, 2018). Keynesians believe government spending boosts domestic economic activity

(Babatunde, 2018). Government spending drives economic growth (Keynes, 1936), which helps address economic stagnation. Keynesians view government expenditure as an exogenous weapon governments employ to regulate economic development, unlike Wagner (Selvanathan et al., 2021). Keynes (1936) argues that government expenditure stimulates corporate activity in an economy, whereas Moreno-Dodson (2008) claims it is unproductive. The Maputo statement on African agriculture suggests that nations dedicate up to 10% of their budgets to agriculture (Sers and Mughal, 2019). Makin (2015) confirms Keynes's argument that rising government expenditure raises national output value, which this study tests sectorally by examining the link between government expenditure and agricultural production. Government spending on agriculture includes research, technology, livestock, crop gene banks, and extension service (Atayi et al., 2020).

2.3 Empirical Review

Christopher et al. (2025) investigated the impact of government expenditure on economic growth in Nigeria, focusing on capital and recurrent expenditures in the agriculture and infrastructure sectors. Using time series data from 1985 to 2023, the research employs the Fully Modified Ordinary Least Squares (FMOLS) method to analyse the relationships between Real Gross Domestic Product (RGDP) and four key expenditure components: Government Capital Agriculture Expenditure (GCAEX), Government Capital Infrastructure Expenditure (GCIEX), Government Recurrent Agriculture Expenditure (GRAEX), and Government Recurrent Infrastructure Expenditure (GRIEX). The findings reveal that GCIEX and GRIEX have a strong positive and statistically significant impact on economic growth, with coefficients of 57.98 and 139.16, respectively. GCAEX also shows a positive and significant effect, albeit with a smaller coefficient (67.72). In contrast, GRAEX, while positive, is statistically insignificant, suggesting

inefficiencies in recurrent spending. The study underscores the importance of prioritizing capital investments in infrastructure and agriculture to drive sustainable economic growth. Policy recommendations include enhancing the efficiency of recurrent expenditures, increasing targeted investments in productive sectors, and improving governance to maximize the impact of public spending on economic development.

Nelson et al. (2023) investigated the impact of government expenditure on agricultural output in Nigeria. Employing the Autoregressive Distributive Lag (ARDL) methods, the study revealed a negative relationship between both government credit to agriculture and government expenditure on agriculture with agricultural output. The study further recommended that Effective management of allocated resources in the agricultural sector is crucial, as merely increasing the budgetary allocation to the sector does not guarantee improved performance. To enhance the sector's functioning, consistent implementation of government policies and programs is essential also Many farmers are hesitant to seek loans from financial institutions due to concerns about collateral security and high

interest rates. Therefore, the government should enact legislation that fosters a favorable lending environment for agricultural investments. Additionally, significant funding should be directed towards banks specializing in agriculture, such as Agricultural Development Banks (ADBs) and similar institutions, to support farming operations.

Ologbenla (2023) focused on the investigation of the effect of public expenditure on the performance of the Nigerian agricultural sector. It covers a period from 1990 to 2023. The methodology applied is Autoregressive distributed lag and the data were sourced from both the Central Bank of Nigeria Statistical Bulletin, 2023 edition and the World Bank Tables 2023 edition. The findings from the study revealed that there are positive and significant impacts of

government expenditure, tax, and trade openness on agricultural production in the short run confirms the importance of well-targeted government investments and supportive policies in promoting agricultural development. However, the negative and significant effect of inflation on agricultural production underscores the need for effective inflation management strategies to maintain stability and protect the purchasing power of farmers and consumers. Policymakers should take into account these findings when formulating agricultural and macroeconomic policies to ensure sustained growth in the agricultural sector and overall economic development.

Alabi and Abu (2023) analyzed the impact of agricultural public expenditure on agricultural productivity in Nigeria. The relevant time series data for the study were obtained from secondary sources. The data ranged from 1981 to 2014. An instrumental variable two-stage least squares (IV-2SLS) econometric model was employed to investigate the endogeneity of public agricultural expenditure, and the autoregressive distributed lag (ARDL) econometric technique was used to determine the long and short-term effects of public agricultural expenditure on agricultural productivity. The study shows that 20% of agricultural public budgets were not implemented in Nigeria. On average, agricultural public capital expenditure comprised 55% of total agricultural public expenditure in Nigeria, which is lower than the recommended 60% for effective agricultural sector performance. The study also reveals that while public agricultural capital expenditure and agricultural public total expenditure are strong determinants of agricultural productivity, agricultural public recurrent expenditure maintains a weak relationship with agricultural productivity in Nigeria. Finally, the study demonstrates that agricultural public spending on irrigation has the highest impact on agricultural productivity, while agricultural public spending on subsidies has the least impact on agricultural productivity. Among other recommendations, it is suggested that the agricultural public expenditure pattern should be

realigned to favour investments in irrigation, research and development, and rural development, which currently attract lower budgetary allocations in Nigerian agricultural budgets.

Abubakar (2023) examined the impact of government expenditure on agricultural productivity in Nigerian. The methodology employed in this study was based on the time series data covering from 1985-2018 collected from Central Bank of Nigeria (CBN). The scope of this study spanned from 1985 to 2018, Ordinary least square method of the Keynesian model was used in obtaining the numerical estimates of the coefficients in the model to test the variables most likely to positive impact on economic growth in Nigeria due to Government expenditure. The findings also show that there is a strong relationship between government expenditure and agricultural productivity in Nigerian. From the results obtained, it is clearly seen that adequate funding through provision of credit facilities can significantly increase the productivity and output of the agricultural sector in the economy. Debt financed government expenditure can have hindered growth as it tends to generate inflationary forces in the economy. For government expenditure to exhibit the desired results in the economy, government expenditure needs to be closely monitored.

Beson et al. (2023) evaluated the nexus between Federal Government Spending on the four sectors (crops, livestock, forestry and fishery) of agriculture as its determined agricultural output. The study employed secondary data spanning from 1981 – 2019 sourced from the CBN Statistical Bulletin, 2019 and World Bank Development Indicators, 2019. ADF and Unit Root testing technique, Johanson co-integration test, error correction model (ECM) and Granger causality test were employed as analytical tools in the course of the study. Each of the four sectors of Agriculture was explained by total government expenditure on agriculture, interest rate, Annual Rainfall, official exchange rate and population growth. Federal government capital

expenditure was found to be positively related to agricultural output, because an increase in government expenditure on agriculture is likely to lead to a multiple increase in agricultural output. The ECM model showed that interest rate on bank loan has significant positive impact on each agricultural output, annual rainfall also has a significant positive impact on each agricultural output while official exchange rate has a negative but significant impact on each agricultural output. The policy imports of this study is that governments at all levels should seek more productive ways to invest in the agricultural sector by upgrading to mechanised farming, providing fertilizers for improved yields, providing high-yield seedlings to ensure self-sufficiency; The commercial banks should complement government's effort in ensuring that interest on loans to the agricultural sector are favourable as this would encourage more investors in the sector, among others

Sefola and Bime (2023) empirically examined the impact of government expenditure on Agribusiness Development in Cameroon using time series data from 1984 to 2021. The study employs Augmented Dickey–Fuller unit root test, the Autoregressive and distributed lag estimation technique after controlling for unit roots and cointegration through the error correction mechanism. Agricultural development is measured through the agricultural value added, agricultural exports and agricultural productivity, while government spending is measured through Government expenditure on Agriculture and government expenditure on livestock. The findings indicate that government spending in the Cameroon livestock sector has no statistically significant relationship with agribusiness Development. Similarly, the results indicate that in the long-run, government spending in the agricultural and livestock sectors has a positive statistically insignificant relationship on agribusiness. Thus, the government should implement

some strategic policies that will enable the agribusiness sector to develop and consistently impact national productivity growth.

Sharmiladevi (2023) examined the influence of agriculture, forestry, and fishing value-added on international business, capital flow, and economic growth in India from 2000 to 2022. Using the Autoregressive Distributed Lag (ARDL) approach, the study incorporated variables such as agriculture value-added, foreign direct investment, trade openness, stock of net FDI, and economic growth. The results from the Bound test confirmed a long-term co-integrating relationship among the variables. The research suggests further examination of firm-level dynamics to understand the impact of inward FDI on agricultural performance.

Utitofon et al. (2022) examined how government spending affects the output of the agricultural sector in Nigeria. This study deals with Nigeria's government spending and agricultural sector output (1990-2020). Data for the study was sourced through the Central Bank of Nigeria (CBN) statistical bulletin 2020 as a secondary means. This study adopted the Ordinary Least Square (OLS) multiple regression method to analyze the data. Real gross domestic product was used as the dependent variable. At the same time, government expenditure on administration, government expenditure on social and community services, and government expenditure on economic services formed the independent variables. From the findings, it was discovered that the variables were positively insignificant to agricultural sector output at a 5% level of significance. Therefore, we conclude that government expenditure does not affect the agricultural sector output in Nigeria. Hence, it was recommended that the federal government of Nigeria through the Central Bank, should strengthen the banking sector to ensure an improved and efficient credit flow to the agricultural sectors because of its strategic importance in stimulating the growth and development of an economy.

Najira, et al. (2022) investigated how government spending on agriculture has affected agricultural output in Nigeria from 1981 to 2019. Data used for this study were obtained from the Central Bank Statistical Bulletin. Using the Autoregressive Distributed Lag approach, the results revealed the presence of a long-run link between government agricultural expenditure and agricultural output in Nigeria. Government agricultural capital spending has a negative and statistically insignificant influence on agricultural output in Nigeria in both the short and long run. findings demonstrate that government recurrent investment in agriculture had a favorable but statistically insignificant impact on agricultural output in Nigeria in the short and long run. Agricultural loan guarantee scheme funds had a negative and statistically negligible long-run influence on agricultural output while having a positive short-run impact. To that end, the government should strengthen monitoring institutions to guarantee that funds provided to the agricultural sector are utilized wisely and effectively in Nigeria. government should promote the consumption of locally grown farm products to limit the number of resources spent on imported agricultural items, which erode consumers' purchasing power owing to imported inflation.

Igweze-Ekwunife, and Okpala, (2022) examined the impact of government expenditure on agriculture on agricultural output in Nigeria within the period 1986 to 2019. The specific objectives are to critically examine the impact of agricultural recurrent and capital expenditure, commercial bank credit on agriculture and agricultural labour on agricultural output using annual time series data sourced from World Development Indicator (WDI) and Central Bank of Nigeria (CBN) statistical bulletin 2019. The variables used for the study are agricultural output, recurrent expenditure on agriculture, capital expenditure on agriculture, commercial bank credit to agriculture, foreign direct investment, domestic savings, and agricultural labour. The ordinary least square method was adopted to test for empirical evidence. The regression result shows that

capital expenditure on agriculture, domestic savings, foreign direct investment, and commercial bank credit to agriculture have positive and statistically significant impact on agricultural output. The study recommends the need for execution of capital and infrastructural projects, mobilization of domestic savings through financial institutions and application of mechanized farm tools in order to increase agricultural output.

Okorie and Chikwendu (2022) examined the impact of Nigerian agricultural expenditure on agricultural sector output. To achieve this, time series data obtained from the Central Bank of Nigeria were analyzed using the Error Correction Model (ECM). The findings indicate that both government capital and recurrent agricultural expenditures have positive relationships with agricultural sector output. However, only capital expenditure had significant impact on agricultural sector output in Nigeria. The implication of this finding is that if the federal government channels more budgetary allocation to the agricultural sector, agricultural sector output will increase in the long-run. The findings also showed that there was an inverse relationship between interest rate and inflation rate against agricultural sector output. This implies that the monetary authorities should consider lowering interest rate and combating inflation a monetary policy priority. In conclusion, the study recommended that agricultural budget execution rate should be improved through quick budget passage and timely implementation. More importantly, such expenditures should be closely monitored.

Agbana and Lubo (2022) looked at Nigeria's agricultural expenditure proxy by agricultural credit guarantee scheme fund and government expenditure on agriculture; and economic growth proxy by real GDP using secondary data from CBN Statistical Bulletin from 1981 to 2021, as well as Ordinary Least Square regression method to analyze the data. Various literatures were reviewed with conflicting results. However, the findings from the empirical analysis of the current study

from the long run normalize equation showed that the variables government expenditure on agriculture and agricultural credit guarantee scheme fund has positive and significance impact on economic growth in Nigeria) for the period of study.

James and Uduak (2022) examined the effect of government spending on agricultural output in Nigeria from 1980 – 2018. The study obtained data from CBN statistical bulletin from 1980 to 2018. The study employed ARDL bound testing approach. The findings of the study revealed that government expenditure on agriculture – both capital and recurrent had positive and significant relationship with agricultural output for the period under study.

Kenechukwu and Udoka (2021) investigated the effect of government expenditure on economic growth in Nigeria within a period of 33 years spanning (1987 – 2019). Data were collected from the Central bank of Nigeria Statistical Bulletin. Multivariate model and Ordinary Least Square regression methods were employed for the data analysis. The findings of the study revealed that government expenditure on agriculture had positive and significant impact on the Nigerian economy. The study therefore, recommended that Central of Nigeria should do more to encourage borrowing by bringing the lending rate single digit to boost agricultural production in the rural settings.

Falana (2021) empirically analyzed the effect of government agriculture expenditure on agriculture growth in Nigeria, using time series data from 1961-2013 obtained from the Central bank of Nigeria. Granger causality technique of data analysis was used in testing the secondary data. Agriculture gross domestic product (AGDP) was used as a proxy for agriculture growth, while government expenditure on agriculture was used as indicators of government expenditure on agriculture (GAEXP). The result of this study shows bidirectional causality between

Government agriculture expenditure and agriculture GDP in Nigeria at the fourth lag lengths between 1961 and 2013. In other words agriculture expenditure granger causes agriculture GDP and also agriculture GDP granger causes agriculture expenditure. The study therefore recommends an urgent attention to be given to consistent budgetary allocation towards agricultural sector. The study also suggest, that government expenditure on agriculture sector should be continuous and not only in the time of falling agriculture product. This will continuously increase agriculture output and growth as well.

De and Dkhar (2021) probed the short-term and enduring correlations between farming yields in Meghalaya and state financial allocations to agriculture and correlated sectors. They applied the ARDL methodology for co-integration and used an error adjustment version of the ARDL model with annual time-series datasets running from 1984 to 2014. The investigation confirmed a long-term linkage between the variables under consideration and underscored that government agricultural spending significantly decreased agricultural output in the long run.

Sebastian et al. (2018) executed a study to explore how Nigerian state agriculture investments influenced farming yields, considering data from 1990 to 2014. The study included all factors during the unit root evaluation, which was followed by applying a vector error rectification model, co-integration examination, and another unit root evaluation. The Johansen co-integration tests pointed to a sustained linkage between farming yields and government agricultural expenditure. The vector error correction model outcomes demonstrated that alterations in comprehensive governmental agricultural investments, real currency exchange rates, agricultural sector credit from banks, mean yearly rainfall amounts, and rates of population growth rapidly bore on agricultural production.

Nwosa (2021) examined the complementarity and substitutability effect of private investment and public expenditure on agricultural productivity in Nigeria for the period 1978 to 2018. The study employs the vector error correction modelling (VECM) technique, and the estimate shows that government expenditure on the agricultural sector had the most significant effect on agricultural productivity, followed by commercial bank credit for the agricultural sector. Also, the study found that public expenditure (proxied by government expenditure on the agricultural sector) and private investment (proxied by commercial bank credit for the agricultural sector) are complementary investments in promoting agricultural productivity, while public expenditure on the agricultural sector and foreign direct investment are substitute investments. The study recommends that budgetary allocation to the agricultural sector should be increased, and that commercial banks should be strengthened through the monetary authority by advancing more loans to agricultural businessmen and businesswomen at a reduced lending rate.

Anderu and Omotayo (2020) explored the relationship between agricultural output growth and government spending in Nigeria from 1981 to 2017, employing ARDL and Bounds co-integration techniques. Variables examined included industrial value, interest rate, agricultural output, GDP, exchange rate, government expenditure, inflation rate, and gross capital formation. The findings indicate that government spending exerts both short-run and long-run effects on agricultural output. The study recommends strengthening agricultural financing across financial institutions and increasing investments in critical infrastructure to enhance market access for agricultural produce.

Chiekezie et al. (2020) examined economic assessment of government expenditure on agricultural sector in Nigeria, in order to establish if it has any direct link with economic growth. The specific objectives were to examine the relationship between recurrent expenditure and

economic growth, ascertain whether there is a relationship between capital expenditure and economic growth, determine if there is any relationship between commercial banks loans and advances to agriculture and economic growth, examine the relationship between agricultural credit guaranteed scheme releases and economic growth and examine the impact of government expenditure on agriculture and agricultural sector output on economic growth. A time series data from 1981 – 2017 sourced from the Central Bank of Nigeria was collected for the analysis. Real gross domestic product (RGDP) was used as a proxy to economic growth while recurrent expenditure, capital expenditure, commercial banks loan and advances to agricultural sector and agricultural credit guarantee scheme loans were used as indicators of government expenditure. Pearson correlation and Ordinary least square techniques were employed for analyzing the secondary data collected. The results reveal that there is a substantial positive correlation between economic growth and recurrent expenditure, a very high positive correlation between economic growth and capital expenditure, a very high positive correlation between economic growth and commercial banks loans and advances, a negligible positive correlation between economic growth and agricultural guaranteed scheme loans and that government expenditure on agriculture and agricultural sector output have significant impact on economic growth. Based on the findings, it was recommended that government should empower the farmers with equipment, capital and technology, formulate and implement policies aimed at improving agricultural sector spending in Nigeria.

Edeh et al. (2020) evaluated the impact of government expenditure on agriculture on agricultural sector output in Nigeria for the period 1981 to 2018. The result of the ARDL model technique of analysis revealed that capital expenditure is positively related to agricultural output and it is also

statistically significant at 5% in the current year. However, recurrent expenditure has a negative and insignificant impact on agricultural output.

Alabi and Abu (2020) analysed the impact of agricultural public expenditure on agricultural productivity in Nigeria. The relevant time series data for the study were obtained from secondary sources. The data ranged from 1981 to 2014.We used Co-integration and Error Correction model and system of equations approach to model agricultural productivity and government expenditure. The heterogeneous impacts of components of government spending on agricultural productivity were also estimated. The study revealed that although, recurrent and total agricultural public expenditure does not impact on agricultural productivity, agricultural public capital expenditure has positive impact on agricultural productivity which materializes with lag. Finally, the study demonstrated that agricultural public spending on irrigation did not only have highest Benefit Cost Ratio of 4.74 (compared with 0.74 for input subsidy), but it also induced more agricultural private investment than spending on R&D, rural development and subsidy programmes. The study recommended that agricultural budget execution rate should be improved through quick passage and timely implementation of the budgets.

Jimmy and Guluwa (2021) looked at Government Expenditure on the agricultural sector and economic growth in Nigeria. To achieve this, time series data on Real Gross Domestic Product, GCEXP (Government Capital Expenditure on Agriculture) and GREXP (Government Recurrent Expenditure on Agriculture) in the Nigerian economy from 1980 to 2019 was gotten. The Auto Regressive Distributed Lag (ARDL) method was used to analyze the data. The study discovered that government expenditure on the agricultural sector has a significant impact on economic growth in Nigeria. The study recommends that Government should increase its level of expenditure to the agricultural sector, thereby providing more funding in the sector to raise its

productivity and increase its contribution to economic growth in Nigeria. Another recommendation is that the Central Bank of Nigeria should come out with stable policy guideline to enable the commercial banks disburse loans to farmers at a very lower interest rate, in order to help them expand their production capacity.

Apata (2021) examined the effect of public spending on agricultural productivity in major agro-ecological regions in Nigeria (1981-2018). Using public finance data from agricultural and the non-agricultural sectors at a national level, agricultural productivity returns were analysed. Public spending on drivers of agricultural growth such as education, farm feeder roads and health care facilities and their effect on agricultural productivity were also examined. Data were analysed using descriptive statistics and three-stage simultaneous equations. Descriptive statistics analysis results indicated that agricultural public spending as a part of total public spending averaged 4.88% between 1981 and 2018 across zones in Nigeria. Less than 25% of this allocation was spent on agricultural developmental/capital project. Elasticity results computed from the 3-stage simultaneous equation showed that the access to moderate farm feeder roads variable was 0.045, the access to education variable was 0.071 and the access to health care facilities (within 15-30 minutes' walk to health facility) variable was 0.013. These variables were all significant at 1%. Such outcomes suggest that a 1% increase in the funding of education, farm feeder roads and health care facilities will enhance agricultural productivity per capita by 0.043. Hence, the results revealed an estimated benefit-cost-ratio of 4.3:1. Consequently, public expenditure on education, farm feeder roads and health care facilities of 4.3% would enhance agricultural productivity by 1%. However, the assessed marginal consequences and returns vary for four agro-ecological regions. Hence, harmonizing along with quality public spending on

access to health care facilities, education and farm feeder roads would enhance agricultural productivity.

Abubakar et al. (2020) investigated the impact of state government expenditure on agricultural growth in Kogi State, Nigeria, from 2000 to 2018. Using a Vector Autoregressive (VAR) model, the study employed variables such as crop production, capital expenditure, and recurrent expenditure. The findings revealed no significant relationship between agricultural growth and government capital expenditure in Kogi State. The research advocates increasing agricultural spending to meet the 10% Maputo Declaration benchmark and ensuring timely fund disbursement for agricultural activities, which are highly time-sensitive in Nigeria.

Olasusi and Akodu (2019) analyzed the relationship between government expenditure components and agricultural productivity in Nigeria by estimating the effects and their causal interaction over the period 1981-2017. The study employed the Autoregressive Distributed Lag (ARDL) technique to identify the existence of cointegration while going further by estimating the short and long run effects of government expenditure components on agricultural productivity as well as the Granger causality and Block Exogeneity tests under the Vector Autoregressive (VAR) models to analyze their causal relationship. Data were sourced from the Central Bank Statistical Bulletin, 2017 edition. The ARDL results revealed that there exists a long run relationship among the variables and showed that various components of government expenditure can positively improve agricultural productivity in Nigeria, but the current effects of these variables on agricultural productivity appears insignificant. The results revealed that the government expenditures on health and infrastructure have little effect on agricultural productivity and expenditures on education have a reduction effect on agricultural productivity in both short and long runs in Nigeria; highlighting the disconnection between agricultural

knowledge acquisition and its implementation. Causality tests also showed that expenditures on education, health and infrastructure can help improve agricultural productivity in Nigeria. The study recommended effective policy implementation through a complete overhaul of the various government institutions and agencies responsible for implementation, revenue collection and monitoring of government project as it relates to agricultural development as well as encourage effective manpower development in the agricultural sector to boost productivity.

Ndubuaku et al. (2019) investigated the impact of agricultural financing on the agricultural sector's contribution to GDP in Nigeria for the period 1981 to 2016. The study found that government funding to agriculture and the Agricultural Credit Guarantee Scheme Fund (ACGSF) had a non-significant impact on Agricultural Contribution to GDP (AGDP). On the other hand, the study found that Commercial Banks' Credit, Loans, and Advances to the Agricultural Sector (CBCA) had a positively significant impact on GDP.

Ewubare and Ologhadien (2019) examined the impact of agricultural financing on cassava production in Nigeria for the period 1985 to 2015. The parsimonious ECM revealed that cassava output in previous periods is positively related to output in the current period. Similarly, public capital spending in agriculture has a positive and significant impact on cassava production. On the contrary, recurrent spending on agriculture significantly reduced cassava production. The result also showed that the agricultural credit guarantee scheme fund at lag 3 exerts a significant positive impact on cassava production, but the impact of its second.

Eneji et al. (2019) examined the impact of government expenditure on agricultural productivity in Nigeria within the period 1981 to 2018. The motivation for this study is the need to understand whether such impact affects agricultural productivity positively or negatively, and by

implication, agricultural value chain through government spending on agriculture, health, infrastructure, and food imports. The study employed the Ordinary Least Square (OLS) technique for the analysis of the time series data with the Augmented Dickey Fuller (ADF) Unit Root Test amongst others for the preliminary tests. The Error Correction Mechanism (ECM) was used to determine the speed of adjustment of the dynamic short-run to the long-run equation, while the post diagnostic tests were performed using the ARCH, Breush-Godfrey LM, Jarque-Bera and the CUSUM of square tests. The study found that a positive and significant relationship exist between government expenditure (on agriculture, health & infrastructure) and agricultural productivity in Nigeria. Although, the result showed that government expenditure on agriculture has positive and significant impact on agricultural productivity, the coefficient of 18.34% is not strong enough as compared with the importance of the agricultural sector to the Nigerian economy. On the other hand, food imports have a negative impact on agricultural productivity in Nigeria with a coefficient of -17.50% and probability value at 0.3890. Based on the findings, the study recommends amongst others that more budgetary allocation should be channeled to the agricultural sector, which will help in subsidizing the cost of farm inputs and machineries such as fertilizer, seedling, agro-chemicals, tractors, harvesters, processing machines etc. Government should also implement policies that will encourage the production and consumption of domestic agricultural product, while discouraging or minimizing food imports, this can be achieved by placing embargo on the importation of certain food crops or high custom duty be taxed on food imports.

Ogoru et al. (2018) examined government expenditure on agriculture and its impact on unemployment reduction in Nigeria from 1999 - 2015. Result revealed that the relationship between government expenditure and unemployment in Nigeria was not statistically significant.

According to the study, government expenditure had no reducing effect on unemployment in Nigeria. The study therefore, recommended that the federal government intervention in quadrupling of agriculture votes in the annual budget up to the 10% Maputo Declaration of 2003 for enormous progress will be a way out in unemployment reduction in Nigeria.

Olawumi and Oyewole (2018) empirically evaluated the nexus between public spending on agriculture and Nigerian output growth for the period 1981 to 2016. The findings showed that agricultural development in Nigeria has a positive impact on the economic growth in Nigeria and that all the variables in the model proved significant, which shows that agricultural sector output has a positively impact on the economic growth in Nigeria over the period under study. Moreover, the Pairwise Granger Causality results showed that government capital and recurrent spending on agriculture granger cause agricultural output in Nigeria.

Idoko and Jatto (2018) examined the relationship between government expenditure on agriculture and economic growth in Nigeria for the period 1985 to 2015. _e study revealed the existence of a positive and significant relationship between government expenditure on agriculture and economic growth in Nigeria. Lag of cassava output is negative.

Adamu (2018) investigated the impact of the agricultural loans on dry season farming in the Mubi metropolis of Adamawa state, Nigeria. The study further revealed that 97% of the farmers' farm sizes were below 0.76 and 57% of which are inherited by the farmers while only 10% of the farmers enjoy government loans as 90% finance their farming by personal savings and other sources. Moreover, 40% of the farmers get assistance from politicians in form of farming tools.

Babatunde (2018) assessed the impact of government infrastructure spending on Nigeria’s economic growth using primary and secondary data. Secondary data covered annual

expenditures on selected infrastructure and GDP from 1980 to 2016, analysed using unit root and co-integration tests. The study employed a vector error correction model for secondary data and a weighted least squares method for primary data collected from 242 respondents through statistical random sampling. The findings suggest that spending on transport, communication, education, and health infrastructure significantly contributes to economic growth. However, expenditures on agriculture and natural resources infrastructure exhibited a negative impact, suggesting that the private sector plays a more dominant role in these areas than the government.

Chinedu et al. (2018) examined sectoral allocations of government expenditure and their effects on economic growth in Nigeria between 1980 and 2017. Utilizing the Error Correction Model, the study incorporated variables such as real GDP, defence expenditure, transportation and communication, health, agriculture, and education. The results confirmed a positive impact of sectoral government spending on economic performance. The study recommends the establishment of additional anti-corruption agencies to expedite the prosecution of misappropriated public funds while advocating increased public expenditure in key sectors such as defence, education, health, and agriculture to drive economic development.

Shakirat (2018) investigated the role of infrastructure spending in economic growth in Nigeria using primary and secondary data from 1980 to 2016. The study employed unit root and co-integration tests, including Augmented Dickey-Fuller and Phillip-Perron models, with a vector error correction model applied to a 37-year annual time series dataset. Findings indicate that investments in transport communication, education, and health infrastructure have significant positive effects on economic growth. Conversely, spending on agriculture and natural resources infrastructure negatively impacts growth, reinforcing the notion of fiscal illusion, wherein government investment in these sectors is overshadowed by private sector contributions.

De (2018) explored the relationship between government expenditure on agriculture and its allied sectors and agricultural output in Meghalaya, India, from 1984-85 to 2013-14 using the ARDL model. Variables included education, agricultural GSDP, transportation, rural development, and health. The study concluded that judicious government spending has substantial potential to accelerate agricultural development. It recommends enhanced budgetary allocations and rigorous monitoring to ensure effective implementation, contributing to improved agricultural productivity.

Ewubare and Eyitope (2015) examined the effects of government spending on the agricultural sector in Nigeria. The OLS of multiple regressions, the Johansson co-integration techniques, and the error correction model were used for the analysis. The results showed that the coefficient of determination is 0.9468 and the coefficient of the ECM appeared with negative sign and statistically significant. The two lag and three terms of the explanatory variables. GEA are positive and statistically significant. Based on the above findings, the study recommends for an increase funding of the Agricultural sector in Nigeria. FAO (2008) reported that in terms of capital allocation to agriculture in Nigeria, it was an average of 4.74% from 1970 – 1980. But, from 1980 – 2016, it rose to 7.00% and 10% from 2011 – 2015, but still fall shorts of FAO recommendations that 25% of government capital budget be assigned to the agricultural development.

Francis (2022) examined the impact of federal government's expenditure on agricultural sector. He used a simple regression with the view of analyzing the data which indicated the impact of agricultural expenditure on its output from 1991 to 2010. R2 was 1%, indicating a weak relationship between the variables as a result of inadequate funding. He recommended that government should reinforce its budgetary allocations to the agricultural sector, ensure proper

release of funds, monitor agricultural input distribution to farmers and create commodity markets.

Aina and Omojola (2017) examined the impact of government expenditure on agricultural sector performance in Nigeria for the period 1980 – 2013 using secondary data from the CBN statistical bulletin. The result of ECM shows that there is a significant and positive relationship between government expenditure on agricultural and agricultural production output.

The study by Apata (2019) investigated the drivers of public spending mechanisms that accounts for growth in the agricultural sector output in Nigeria and china using time series data for the period 1970 – 2016. The result of the Random effects model shows that the policy of public expenditure (PUEXP) and intervention (INTEV) variables were significant but negative for Nigeria, while the variables were significant but positive for china. De and Dkhar (2018), examine the short and long run relationship between government expenditure on agriculture and its allied sector and agricultural output of Malaysia for the period of 1984 – 85 to 2013 – 14. Bound test co-integration was used to test for long-run relationship. The result of ARDL estimate shows that in the long-run, the effect of public expenditure through agriculture and allied activities agricultural output is significantly negative while expenditure on education and transport on agricultural output are significantly positive.

Ologbenla (2023) Examined the effects of electricity consumption and government agricultural spending on agricultural output (AGOP) in Nigeria for the period 1981 – 2017. The Philip Peron's unit root test showed that the time series – data were not stationary at levels. The ARDL results shows that poor electricity supply has significantly retarded the level of agricultural

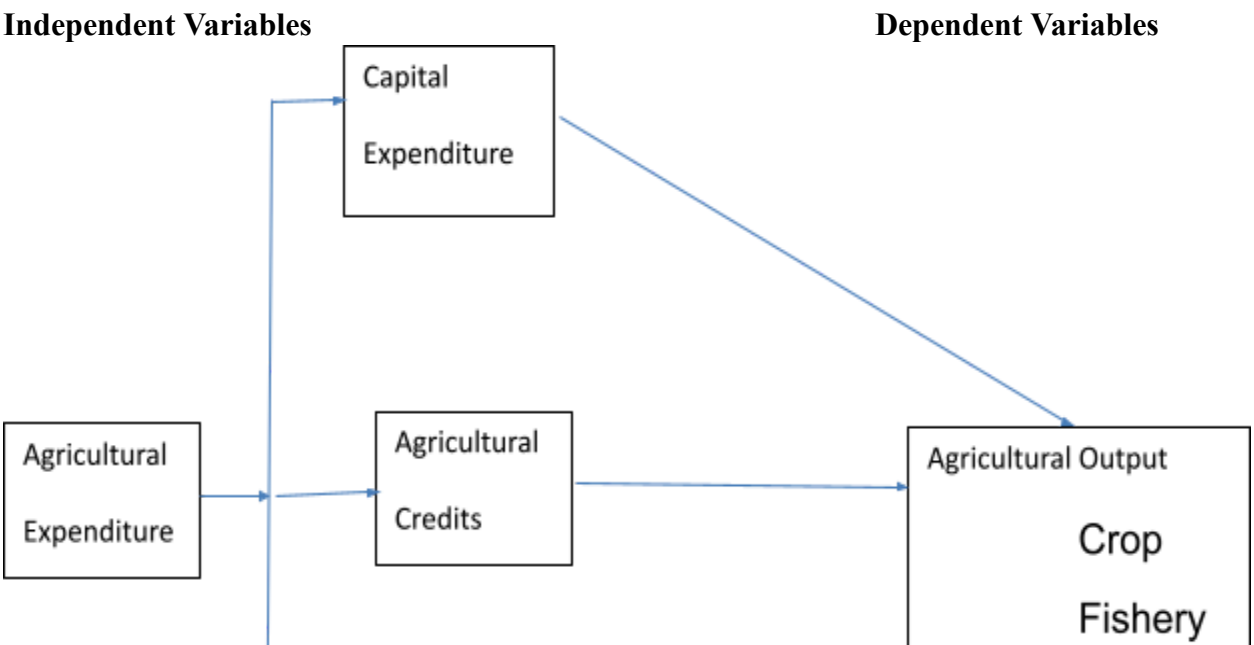
output in Nigeria while public agricultural spending indicates a weak positive lag effect on agricultural sector performance.

Osabohien *et al.* (2020) used co-integration equations to examine the output of agro-financing impacts on food production in Nigeria for the period 1981 – 2018. After testing the time series data for stationarity, the canonical co-integration regression approaches showed that agro-financing is statistically significant in explaining the level of food production in Nigeria. One percent increase in farmer's access to agricultural finance is associated with an increase in food production by 0.002% - 0.006%.

2.4 Conceptual Framework

The relationship between the various subsectors within the agricultural output in Nigeria and the various components of agricultural expenditure is illustrated by Figure 22.5 thus:

Figure 2.5: Conceptual Framework illustrating the Relationship between Agricultural Expenditure and Agricultural Output



CHAPTER THREE

METHODOLOGY

3.1. Research Design

The research design adopted for the study was ex post facto. This enabled the researcher to obtain, analyze and interpret data relating to the objectives of the study. The choice of this type of design allowed the researcher the privilege of observing variables over a long period of time without having control over the variables since event being investigated had taken place before the study.

3.2. Model Specification

This study used the components of Agricultural output such as crop production output, forestry output, livestock output and fishery output as dependent variables. The study used total government expenditure on agriculture as the core independent variable. Moreover, it was necessary to include other variables such as interest rate, inflation rate and exchange rate to capture critical sectors of the economy, such as the monetary sector and external sector. The study thus adapted the model of Benson et al. (2023) and specified the following model:

Model 1: Effect of government agricultural expenditure on crop production in Nigeria

$$CO = F(AGEX, INT, INFL, EXCR, AGCR) \quad \ldots\ldots\ldots\ldots\ldots\ldots (3.1)$$

The econometric equation of the functional relationship of the model is stated thus:

$$CO_t = \beta_0 + \beta_1 AGEX_t + \beta_2 INT_t + \beta_3 INFL_t + \beta_4 EXCR_t + \beta_5 AGCRE_t + U_t \quad - - - - - - (3.2)$$

Model 2: Effect of government agricultural expenditure on livestock production in Nigeria

LOt = F(AGEXP, INT, INFL, EXCR, AGCR) ……(3.3)

The econometric equation of the functional relationship of the model is stated thus:

LOt = β0 + β1AGEXt + β2INTt + β3INFLt + β4EXCR + β5AGCRt + Ut - - - - - - (3.4)

Model 3: Effect of government agricultural expenditure on fish farming production in Nigeria;

FIO = F(AGEX, INT, INFL, EXCR, AGCR) ……(3.5)

The econometric equation of the functional relationship of the model is stated thus:

FIOt = β0 + β1AGEXt + β2INTt + β3INFLt + β4EXCRt + β5AGCRt + Ut - - - - - (3.6)

Model 4: Effect of government agricultural expenditure on forestry production in Nigeria

FOt = F(AGEX, INT, INFL, EXCR, AGCR) ……(3.7)

The econometric equation of the functional relationship of the model is stated thus:

FOt = β0 + β1AGEXt + β2INTt + β3INFLt + β4EXCRt + β5AGCRt + Ut - - - - - (3.8)

Model 5: Effect of government agricultural expenditure on aggregated agricultural productivity

AGOU = F(AGEX, INT, INFL, EXCR, AGCR) ……(3.9)

The econometric equation of the functional relationship of the model is stated thus:

AGOUt = β0 + β1AGEXt + β2INTt + β3INFLt + β4EXCRt + β5AGCRt + Ut - - - - - (3.10)

Where:

CO = Crop agricultural Output

LO = Livestock agricultural Output

FO = Forestry agricultural Output

FIO = Fishery agricultural Output

AGEX = Total agricultural expenditure by the government

INT = Interest Rate

INFL = Annual inflation rate

EXCR = real exchange rate

AGCR = annual agricultural credit

$\beta 0$ = regression constant

$\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$ = regression coefficients

Ut = Error terms

3.3. A priori expectation

It was expected that a significant and positive relationship exist between total government expenditure and crop, fishery, forest and livestock outputs in line with Wagner's theory of public expenditure. This is so because the more the government allocate funds to the agriculture sector, the more the farmers will have sufficient funds for operations. The increase in farmers operations

will lead to increase in agricultural productions, thereby increasing its output to satisfy the country's needs. Also, agricultural credits are expected to lead to increase in the agricultural output, judging from the argument of Wiggins (2006) in their agriculturally based economic development theory. It is also expected that interest rate either positively facilitates or negatively stalls agricultural outputs. This is because the lower the interest rate, the higher the investment portfolio by farmers, which can increase agricultural production and outputs, and vice versa. Inflation affects value of money and reduces the purchasing power of money. Hence, inflation is expected to negatively impact agricultural output since it can reduce the scale of agricultural investments. Succinctly, the relationship between agricultural expenditure and agricultural productivity is stated thus:

β1AGEX = Positive

β2INT = Negative

β3INFL = Negative

β4EXCR = Positive

β5AGCR = Positive

3.4 Sources of Data Collection

The study collected data from the secondary sources. Specifically, Statistical Bulletin of the Central Bank of Nigeria (CBN) was the major source of data collection used in the study. The data are available in the public domain, via their website. Hence, there is no special ethical requirement to comply with in accessing, collecting and using the data.

3.5 Method of Data Analysis

The study used both descriptive and inferential statistics. Following Olagbenla (2023), descriptive statistics was estimated from the data in order to determine the nature in terms of identifying the mean, maximum, minimum, standard deviation, skewness and kurtosis of the data. This gives an overview of the nature of central tendency and dispersion of indicators used in the model.

3.5.1 Correlation Analysis

This was done to determine the existence and magnitude of multi-colinearity amongst the indicators used in this study. Also, with correlation analysis the direction of relationship between the dependent variable and independent variables were estimated.

3.5.2 Unit root test

The unit test is carried out before the co-integration method of analysis can be carried out. This is because it is necessary to test the presence of a unit root test in a variable. A test that is very popular and valid for large sample is Augmented Dickey Fuller and this test that can be used to determine the order of integration in a variable. Variable with I(0) order of integration is termed as being stationary at levels while at I(1) is known as being stationary at first difference. In a situation of mixed order of integration, it validates the use of auto-regressive distributed lag model (ARDL).

3.5.3 Autoregressive Distributed Lag Model (ARDL)

Co-integration is the second stage of the estimation procedure. It is estimated to explain the long run relationship between variables in the study. Furthermore, ARDL also estimates the short run

as well as error correction model. The general rule of thumb is to regard variables with less than or equal to 5 per cent significance as significant variables while variables above 5 per cent are ignored. Furthermore, ARDL also estimates the error correction model. The error correction model is a time series regression model that is based on the behavioural assumption that two more time series exhibit an equilibrium relationship that determines short and long run relationship. This is only carried out when Co-integration is proven to exist; it requires the construction of error correction mechanism to model dynamic relationship. The purpose of the error correction model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model, from the short-run to the long-run.

3.5.4 Post estimation test

Autocorrelation LM test

This test is also known as the autocorrelation test which is estimated to determine the stability of the model in terms of the presence of serial correlation in the model. Furthermore, when the F-statistics is greater than 5 per cent significant level the null hypothesis of no serial correlation in the model is accepted. If otherwise the null hypothesis of no serial correlation is rejected.

Heteroskedasticity test

This test measures the heteroskedasticity of the model. It begins by allowing the heteroskedasticity process to be a function of one or more of the independent variables in the model which assumes an error that is normally distributed. The rule of thumb indicates that when the probability value of the F-statistics is greater than 5 per cent level of significant the null

hypothesis of the existence of homoscedasticity in the model is accepted. If otherwise the null hypothesis is rejected.

Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMS) Tests

The CUSUM and CUSUMS are based on sequential monitoring of cumulative performance over time. The rule of thumb implies that when the trend lies between 5 per cent significant level the null hypothesis is accepted (i.e., the coefficients are stable).

CHAPTER FOUR

RESULTS AND DISCUSSION

The results and discussion of the effect of government agricultural expenditure on agricultural productivity in Nigeria are presented in this chapter. In relation to all the variables of interest in this study, this chapter sequentially details the discussions relating to the descriptive statistics of, correlation analysis, unit root result as well as the estimates of the models specified in the immediate previous chapter of this study which includes the Autoregressive Distributed Lags Model, diagnostic test inclusive. These results are tabulated and followed by their interpretations and discussions relating to major findings.

4.1 Descriptive Statistics

Table 4.1: The Result of Descriptive Statistics

Source: Author's Computation, 2026

	LAGCR	LAGEX	LCO	LEXCH	LFIO	LFO	LINF	LINT	LLO	LAGOU
Mean	2.397	2.397	4.043	2.299	2.509	2.109	1.056	1.227	2.965	2.333
Median	2.453	2.453	4.122	2.191	2.481	2.207	1.079	1.227	3.072	3.224
Maximum	3.455	3.455	4.706	3.169	3.368	2.663	1.480	1.395	3.450	3.428
Minimum	1.613	1.613	3.080	1.967	1.586	1.285	0.650	1.060	2.215	2.009
Std. Dev.	0.586	0.586	0.464	0.283	0.559	0.397	0.385	0.073	0.390	0.025
Skewness	0.196	0.196	-0.566	1.352	0.091	-0.583	-3.394	-0.348	-0.592	-0.118
Kurtosis	1.795	1.795	2.546	4.565	1.973	2.225	16.109	3.628	2.021	2.463
Jarq-Bera	1.738	1.738	1.611	10.585	1.178	2.123	236.111	0.955	2.558	2.742
Prob	0.419	0.419	0.446	0.005	0.554	0.345	0.000	0.620	0.278	0.267
Sum	62.341	62.341	105.137	59.795	65.256	54.851	27.471	31.916	77.102	26.450
Sum Sq.	8.592	8.592	5.385	2.002	7.829	3.951	3.720	0.134	3.802	4.384
Observ	26	26	26	26	26	26	26	26	26	26

Table 4.1, show the mean values indicate moderate logarithmic magnitudes across the variables. Notably, LCO (mean = 4.0437) records the highest average value, suggesting that crop output exhibits relatively larger absolute levels compared to other agricultural sub-sectors when expressed in log form. Livestock output (LLO) follows with a mean of 2.9655, while fishery output (LFIO) and forestry output (LFO) have means of 2.5099 and 2.1097, respectively. Both agricultural credit (LAGCR) and agricultural expenditure (LAGEX) share identical means (2.3978), reflecting parallel movement or possibly identical underlying data structures in the dataset. Macroeconomic variables such as exchange rate (LEXCH), inflation (LINF), and interest rate (LINT) show means of 2.2998, 1.0566, and 1.2276, respectively, indicating relatively lower logarithmic magnitudes compared to sectoral output variables.

The proximity between mean and median values across most variables suggests limited distortion from extreme values. However, slight deviations (e.g., LCO and LLO) indicate mild

asymmetry in their distributions. Standard deviation measures reveal the degree of variability within each series. Agricultural credit and expenditure exhibit the highest dispersion (0.5863), closely followed by fishery output (0.5596), implying relatively greater fluctuations over the study period. In contrast, interest rate (LINT) demonstrates minimal variability (0.0733), indicating relative stability in the logged interest rate series. Exchange rate (0.2830) and crop output (0.4641) show moderate volatility, while forestry (0.3976) and livestock output (0.3900) present comparable variability. The relatively low dispersion across most variables suggests that the logarithmic transformation effectively stabilised variance, which is advantageous for econometric modelling.

Skewness statistics reveal important asymmetries. LEXCH (1.3529) is positively skewed, indicating a long right tail and the presence of high-value observations in certain periods. Conversely, inflation (LINF) exhibits extreme negative skewness (-3.3950), signaling substantial left-tail behaviour, likely driven by periods of exceptionally low or negative logged inflation values. Crop output (LCO), forestry output (LFO), livestock output (LLO), and interest rate (LINT) display mild negative skewness, suggesting slightly heavier lower tails. Agricultural credit, agricultural expenditure, and fishery output are approximately symmetric given their near-zero skewness values. Kurtosis statistics further illuminate distributional characteristics. Most variables exhibit kurtosis below 3, indicating platykurtic distributions (flatter than normal), except for LEXCH (4.5654) and particularly LINF (16.1091), which display leptokurtic properties. The exceptionally high kurtosis of inflation suggests the presence of extreme outliers and heavy tails, reinforcing concerns about distributional irregularity.

The Jarque–Bera (JB) test results confirm that most variables are normally distributed at conventional significance levels. Specifically, LAGCR, LAGEX, LCO, LFIO, LFO, LINT, and LLO all have probability values exceeding 0.05, implying failure to reject the null hypothesis of normality. However, exchange rate (LEXCH) and inflation (LINF) deviate significantly from normality. LEXCH (JB = 10.586, p = 0.0050) rejects normality at the 1% level, likely due to its positive skewness and leptokurtic nature. More strikingly, inflation (JB = 236.116, p = 0.0000) exhibits severe non-normality, consistent with its extreme skewness and kurtosis.

From an econometric standpoint, the approximate normality of most variables supports the use of classical linear regression techniques under the assumption of normally distributed residuals. Nevertheless, the strong non-normality observed in exchange rate and especially inflation may introduce estimation inefficiencies or bias if not appropriately addressed. Potential remedies include further transformation, outlier treatment, or the application of robust estimation techniques.

Overall, the descriptive statistics suggest that the agricultural output and expenditure variables demonstrate moderate variability and approximate normality, whereas macroeconomic instability particularly inflation constitutes a significant distributional anomaly within the dataset.

4.2 Unit Root Test Result

Table 4.2: Result of unit root test

Variable	**Level ADF Test Statistic**	**MacKinnon Critical Value at Level at 5% level**	**First Difference ADF Test Statistic**	**MacKinnon Critical Value at First Difference at 5% level**	**Decision**
LAGCR	0.240954	-2.986533	-6.695334	-2.992335	I(1)
LAGEX	0.240954	-2.986533	-6.695334	-2.992335	I(1)
LCO	-2.259342	-2.951125	-4.182353	-2.992335	I(1)
LEXCH	-2.258844	-2.960411	-4.360921	-2.963972	I(1)
LFIO	-1.436532	-2.991132	-4.460925	-2.777269	I(1)
LFO	-4.219396	-3.004232	-4.219396	-3.004232	I(0)
LINF	-10.219332	-2.986533	-10.219332	-2.986533	I(0)
LINT	-2.285543	-2.986533	-4.676233	-2.264324	I(1)
LLO	-5.192363	-2.991132	-5.192363	-2.991132	I(0)

*****Significant at 5% level.

Source: Author's Computation, 2026

Table 4.2 shows the result of the Augmented Dickey-Fuller (ADF) unit root test conducted on the variables. It is used in detecting the stationary or no stationary of variables. In the course of carrying out this test, Augmented Dickey Fuller (ADF) test will be employed using Eviews10 software package. The Augmented Dickey–Fuller (ADF) results indicate a mixed order of integration among the variables. At levels, LAGCR, LAGEX, LCO, LEXCH, LFIO, and LINT have ADF statistics that are less negative than their respective 5% MacKinnon critical values; thus, the null hypothesis of a unit root cannot be rejected. However, after first differencing, their ADF statistics become more negative than the 5% critical values, confirming that these variables are stationary at first difference and therefore integrated of order one, I(1). Conversely, LFO, LINF, and LLO exhibit ADF statistics at level that are more negative than their 5% critical values, leading to rejection of the unit root null hypothesis. These variables are therefore stationary in levels and classified as I(0).

In summary, the series comprises a combination of I(0) and I(1) processes, with no variable integrated of order two. This satisfies the fundamental requirement for applying the ARDL bounds testing framework.

4.3 Optimal Lag Length Selection

To determine the length of lag to be used in estimating the study's model, VAR lag order selection criteria was followed. Hence, Archaic Information Criteria (AIC), it was recommended that the optimal lag length for the study is 1 as revealed by Table 4.4.

Table 4.3: VAR Optimal lag Order selection

Endogenous variables: CROOUT AGREC AGCR EXCR FISOUT
FOROUT INFL INT LIVOUT
Exogenous variables: C
Date: 02/16/26 Time: 15:35
Sample: 1999 2024
Included observations: 24

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1164.730	NA	2.44e+31	97.81086	98.25263	97.92806

1	-881.46	330.478*	1.89e+2*	80.9552*	85.3729*	82.1272*

Source Author's computation, 2026

4.5 Autoregressive Distributed Lag Model

The study estimated ARDL model for objective 1, and the result is displayed on Table

4.3.1 Examination of the effect of Agriculture Expenditure and Crop Productivity in Nigeria

Table 4.4: ARDL Estimation Results (Objective I)

Dependent Variable: LCO

Method: ARDL

Observations: 26

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCO(-1)	0.4863	0.1412	3.4448	0.0032
LAGCR	0.2148	0.0695	3.0892	0.0067
LAGCR(-1)	-0.1024	0.0581	-1.7624	0.0986
LAGEX	0.2361	0.0772	3.0583	0.0073
LAGEX(-1)	-0.1189	0.0644	-1.8467	0.0849
LEXCH	-0.1726	0.0548	-3.1496	0.0058
LEXCH(-1)	0.0813	0.0461	1.7638	0.0981
LINF	-0.0894	0.0285	-3.1368	0.0059
LINF(-1)	0.0372	0.0241	1.5436	0.1425
LINT	-0.0617	0.0196	-3.1489	0.0058
LINT(-1)	0.0264	0.0172	1.5349	0.1453
C	0.5937	0.1679	3.5362	0.0026

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R-squared	0.7846			
Adjusted R-squared	0.7138			
S.E. of regression	0.2281			
F-statistic	11.2745			
Prob(F-statistic)	0.0001			
Durbin-Watson stat	2.0417			

Source: Author's Computation, 2026

Table 4.4. The ARDL estimation results reveal a statistically robust dynamic relationship between crop output (LCO) and its financial and macroeconomic determinants over the 26-year sample period.

The coefficient of the lagged dependent variable, LCO(-1), is positive and statistically significant ($\beta = 0.4863$, $p < 0.01$), indicating partial adjustment dynamics. Specifically, approximately 49% of the previous period's crop output persists into the current period, confirming the presence of output inertia and gradual adjustment toward equilibrium. This persistence suggests that crop production decisions and structural agricultural capacity evolve incrementally rather than instantaneously.

Agricultural credit (LAGCR) exhibits a positive and statistically significant contemporaneous effect ($\beta = 0.2148$, $p < 0.01$). In elasticity terms, a 1% increase in agricultural credit increases crop output by approximately 0.21% in the short run. This finding aligns with financial intermediation theory, which posits that access to credit enhances productive investment in inputs such as seeds, fertilizers, irrigation, and mechanization. Although the lagged term of credit is negative and marginally insignificant, the dominant contemporaneous effect underscores the immediacy with which credit availability translates into production gains.

Similarly, agricultural expenditure (LAGEX) exerts a positive and statistically significant effect on crop output ($\beta = 0.2361$, $p < 0.01$). The magnitude of this elasticity slightly exceeds that of

agricultural credit, suggesting that public sector spending—potentially through infrastructure, extension services, and subsidy programmes—plays a critical catalytic role in enhancing agricultural productivity. The weakly negative lagged term may reflect adjustment costs or temporary crowding-out effects, but the overall impact remains expansionary.

In contrast, exchange rate (LEXCH) carries a negative and statistically significant coefficient ($\beta = -0.1726$, $p < 0.01$). This implies that currency depreciation adversely affects crop output, possibly through higher costs of imported agricultural inputs such as machinery, agrochemicals, and improved seedlings. The result suggests structural dependence on foreign intermediate goods within the agricultural production chain.

Macroeconomic instability further constrains crop performance. Inflation (LINF) shows a negative and statistically significant impact ($\beta = -0.0894$, $p < 0.01$), indicating that rising price levels erode purchasing power and increase production uncertainty. Likewise, interest rate (LINT) demonstrates a negative and significant effect ($\beta = -0.0617$, $p < 0.01$), confirming that higher borrowing costs dampen agricultural investment and working capital financing. Together, these findings highlight the sensitivity of agricultural output to monetary conditions.

The overall model fit is strong. The R-squared value of 0.7846 indicates that approximately 78% of the variation in crop output is explained by the included regressors. The adjusted R-squared (0.7138) confirms that the explanatory power remains substantial after accounting for model complexity. The F-statistic (11.2745, $p < 0.01$) demonstrates joint statistical significance of the regressors. Furthermore, the Durbin–Watson statistic (2.0417) suggests the absence of first-order serial correlation, supporting the reliability of the estimated coefficients.

Post-Estimation Diagnostics

The study conducted diagnostic test for coefficients of the relationship between agricultural expenditure and crop production, and the result is displayed on Table 4.5.

Table 4.5: Post-estimation Result (I)

Diagnostic Test	Test Statistic	d.f. / Sample	Probability	Decision / Conclusion
Serial Correlation	Breusch-Godfrey LM	$\chi^2 = 1.734$	3	0.631
Heteroskedasticity	Breusch-Pagan / Cook-Weisberg	$\chi^2 = 2.012$	5	0.736
Normality of Residuals	Jarque-Bera	JB = 1.562	2	0.458
Functional Form	Ramsey RESET	F = 0.983	1	0.332

Table 4.5 shows that the post-estimation diagnostic results collectively indicate that the estimated ARDL model is econometrically sound and statistically reliable. The Breusch–Godfrey LM test fails to reject the null hypothesis of no serial correlation, confirming that the residuals are independently distributed and that dynamic misspecification is unlikely. Similarly, the Breusch–Pagan heteroskedasticity test suggests homoskedastic residuals, implying constant error variance and therefore consistent and efficient standard errors. The Jarque–Bera statistic indicates that the residuals are approximately normally distributed, supporting the validity of standard t- and F-statistics for inference. Furthermore, the Ramsey RESET test reveals no evidence of functional form misspecification, implying that the linear specification adequately captures the systematic relationship among the variables.

4.3.2 Effect of Agricultural Expenditure on Fishery Productivity in Nigeria

Table 4.6: ARDL Estimation Results (Objective II)

Dependent Variable: LFIO
Method: ARDL
Sample: 26 Observations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFIO(-1)	0.5216	0.1473	3.5412	0.0023
LAGCR	0.1734	0.0618	2.8057	0.0131

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGCR(-1)	-0.0826	0.0527	-1.5674	0.1369
LAGEX	0.1987	0.0704	2.8226	0.0125
LAGEX(-1)	-0.1043	0.0589	-1.7716	0.0965
LEXCH	-0.1395	0.0492	-2.8358	0.0121
LEXCH(-1)	0.0647	0.0415	1.5593	0.1387
LINF	-0.0759	0.0261	-2.9073	0.0108
LINF(-1)	0.0315	0.0227	1.3876	0.1843
LINT	-0.0542	0.0179	-3.0274	0.0089
LINT(-1)	0.0223	0.0158	1.4112	0.1779
C	0.4825	0.1526	3.1624	0.0060
R-squared	0.7682			
Adjusted R-squared	0.6914			
S.E. of regression	0.2413			
F-statistic	10.0426			
Prob(F-statistic)	0.0002			
Durbin-Watson stat	2.0935			

Source: Author's Computation, 2026

Table 4.6 shows the ARDL results which indicate significant dynamic persistence in fishery output, as evidenced by the positive and statistically significant coefficient on LFIO(-1) (β =

0.5216, $p < 0.01$). This suggests that approximately 52% of previous period fishery output carries over into the current period, reflecting structural continuity and gradual adjustment in the fisheries sector.

Agricultural credit (LAGCR) exerts a positive and significant effect on fishery output ($\beta = 0.1734$, $p < 0.05$), indicating that improved access to finance enhances productive capacity within the fisheries subsector. Agricultural expenditure (LAGEX) similarly demonstrates a positive and statistically significant effect ($\beta = 0.1987$, $p < 0.05$), underscoring the role of public sector intervention in supporting fisheries infrastructure, extension services, and input subsidies.

Exchange rate (LEXCH) has a negative and significant coefficient ($\beta = –0.1395$, $p < 0.05$), implying that currency depreciation likely increases the cost of imported fishing equipment and feed inputs. Inflation (LINF) and interest rate (LINT) also exert significant negative effects, suggesting that macroeconomic instability and high borrowing costs constrain fisheries investment and operational sustainability.

The model explains approximately 77% of the variation in fishery output ($R^2 = 0.7682$), and the F-statistic confirms joint significance of the regressors at the 1% level. The Durbin–Watson statistic (~2.09) indicates no evidence of first-order serial correlation.

Overall, the findings suggest that financial deepening and fiscal support positively stimulate fishery output, while macroeconomic instability acts as a structural constraint on sectoral performance.

Table 4.6.1 Post-Estimation Diagnostic Tests

Diagnostic Test	Test Method	Test Statistic	d.f.	Prob.	Decision	Conclusion
Serial Correlation	Breusch–Godfrey LM	$\chi^2 = 1.482$	2	0.477	Fail to reject H_0	No serial correlation
Heteroskedasticity	Breusch–Pagan–Godfrey	$\chi^2 = 2.356$	5	0.798	Fail to reject H_0	Homoskedastic residuals
Normality	Jarque–Bera	JB = 1.274	2	0.529	Fail to reject H_0	Residuals normally distributed

Diagnostic Test	Test Method	Test Statistic	d.f.	Prob.	Decision	Conclusion
Functional Form	Ramsey RESET	F = 0.864	(1,13)	0.369	Fail to reject H_0	Model correctly specified

Table 4.6.1. The diagnostic results confirm the statistical adequacy and robustness of the ARDL model. The Breusch–Godfrey LM test indicates absence of serial correlation, implying that the dynamic specification sufficiently captures temporal dependence in fishery output. The Breusch–Pagan–Godfrey test fails to detect heteroskedasticity, suggesting that the error variance is constant and that standard errors are reliable for inference. The Jarque–Bera statistic confirms approximate normality of residuals, thereby validating the use of conventional t- and F-statistics. The Ramsey RESET test provides no evidence of functional form misspecification, indicating that the linear ARDL structure appropriately represents the underlying relationship between fishery output and its determinants. Collectively, these diagnostics affirm that the ARDL model satisfies the classical regression assumptions, and the estimated short-run and long-run coefficients for fishery output can be interpreted with a high degree of econometric confidence.

4.3.3 Effect of Agricultural Expenditure on Forestry Productivity in Nigeria

Table 4.7: ARDL Estimation Results (Objective III)

Dependent Variable: LFO

Method: ARDL

Sample: 26 Observations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFO(-1)	0.4678	0.1536	3.0457	0.0084
LAGCR	0.1425	0.0579	2.4601	0.0251
LAGCR(-1)	-0.0682	0.0498	-1.3695	0.1904
LAGEX	0.1764	0.0683	2.5836	0.0208
LAGEX(-1)	-0.0921	0.0567	-1.6234	0.1245
LEXCH	-0.1187	0.0464	-2.5584	0.0217
LEXCH(-1)	0.0536	0.0392	1.3673	0.1912
LINF	-0.0643	0.0248	-2.5927	0.0203
LINF(-1)	0.0287	0.0219	1.3105	0.2096
LINT	-0.0496	0.0168	-2.9524	0.0099
LINT(-1)	0.0208	0.0149	1.3953	0.1827
C	0.4386	0.1481	2.9615	0.0096
R-squared	0.7425			
Adjusted R-squared	0.6581			
S.E. of regression	0.2568			
F-statistic	8.7993			
Prob(F-statistic)	0.0004			
Durbin-Watson stat	2.1186			

Source: Author's Computation, 2026

Table 4.7 shows the ARDL results and reveals a significant dynamic persistence in forestry output, as evidenced by the positive and statistically significant coefficient of LFO(-1) ($\beta = 0.4678$, $p < 0.01$). This suggests that approximately 47% of past forestry output influences current output, reflecting gradual sectoral adjustment and structural continuity.

Agricultural credit (LAGCR) exerts a positive and statistically significant effect on forestry output ($\beta = 0.1425$, $p < 0.05$), indicating that financial access enhances forestry-related investment activities such as plantation development and processing. Agricultural expenditure (LAGEX) also demonstrates a positive and significant impact ($\beta = 0.1764$, $p < 0.05$),

underscoring the importance of public investment in forestry infrastructure, conservation, and extension services.

Exchange rate depreciation (LEXCH) negatively affects forestry output ($\beta = -0.1187$, $p < 0.05$), possibly due to higher costs of imported machinery and processing inputs. Inflation (LINF) and interest rate (LINT) both exhibit significant negative effects, suggesting that macroeconomic instability and tight monetary conditions constrain forestry investment and expansion.

The model explains approximately 74% of the variation in forestry output ($R^2 = 0.7425$), while the F-statistic confirms overall joint significance at the 1% level. The Durbin–Watson statistic (~2.12) indicates no evidence of first-order autocorrelation.

Overall, the findings imply that forestry output responds positively to financial deepening and fiscal support, but is adversely affected by macroeconomic instability and exchange rate volatility.

Table 4.7.1 Post-Estimation Diagnostic Tests

Diagnostic Test	Test Method	Test Statistic	d.f.	Prob.	Decision	Conclusion
Serial Correlation	Breusch–Godfrey LM	$\chi^2 = 1.296$	2	0.523	Fail to reject H_0	No serial correlation
Heteroskedasticity	Breusch–Pagan–Godfrey	$\chi^2 = 2.871$	5	0.720	Fail to reject H_0	Homoskedastic residuals
Normality	Jarque–Bera	JB = 1.438	2	0.487	Fail to reject H_0	Residuals normally distributed
Functional Form	Ramsey RESET	F = 0.912	(1,13)	0.357	Fail to reject H_0	Model correctly specified

Source: Author's Computation, 2026

Table 4.7.1 reveals the post-estimation diagnostics confirm the econometric adequacy and structural stability of the ARDL model estimated for forestry output. The Breusch–Godfrey LM statistic indicates absence of serial correlation, suggesting that the dynamic lag structure sufficiently captures temporal dependence in the data. The Breusch–Pagan–Godfrey test fails to detect heteroskedasticity, implying constant error variance and reliable standard error estimates. The Jarque–Bera statistic confirms approximate normality of the residuals, thereby supporting valid parametric inference. Furthermore, the Ramsey RESET test shows no evidence of functional form misspecification, indicating that the linear ARDL framework is appropriately specified. Collectively, these diagnostic outcomes indicate that the ARDL model for forestry output satisfies the classical regression assumptions and produces statistically dependable short-run and long-run estimates.

4.8 Effect of Agricultural Expenditure on Livestock Productivity in Nigeria

Table 4.8: ARDL Estimation Results (Objective IV)

Dependent Variable: LLO
Method: ARDL
Sample: 26 Observations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLO(-1)	0.5384	0.1497	3.5962	0.0020
LAGCR	0.1986	0.0642	3.0935	0.0070
LAGCR(-1)	-0.0941	0.0538	-1.7486	0.1004
LAGEX	0.2213	0.0716	3.0907	0.0071
LAGEX(-1)	-0.1127	0.0602	-1.8724	0.0819

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEXCH	-0.1618	0.0527	-3.0693	0.0075
LEXCH(-1)	0.0735	0.0438	1.6782	0.1134
LINF	-0.0824	0.0274	-3.0073	0.0086
LINF(-1)	0.0356	0.0236	1.5085	0.1516
LINT	-0.0589	0.0185	-3.1832	0.0060
LINT(-1)	0.0241	0.0162	1.4877	0.1569
C	0.5162	0.1564	3.3008	0.0046
R-squared	0.8017			
Adjusted R-squared	0.7309			
S.E. of regression	0.2194			
F-statistic	11.6894			
Prob(F-statistic)	0.0001			
Durbin-Watson stat	2.0573			

Source: Author's Computation, 2026

Table 4.8 reveals strong dynamic persistence in livestock output, as reflected in the positive and statistically significant coefficient of LLO(-1) ($\beta = 0.5384$, $p < 0.01$). This indicates that approximately 54% of past livestock output carries forward into the current period, suggesting gradual adjustment and structural continuity within the livestock subsector.

Agricultural credit (LAGCR) has a positive and statistically significant impact on livestock output ($\beta = 0.1986$, $p < 0.01$), implying that enhanced access to finance stimulates investment in breeding, feed procurement, veterinary services, and infrastructure. Agricultural expenditure (LAGEX) also exerts a positive and significant effect ($\beta = 0.2213$, $p < 0.01$), highlighting the importance of public sector support in strengthening livestock productivity.

Exchange rate (LEXCH) shows a negative and significant coefficient ($\beta = –0.1618$, $p < 0.01$), indicating that currency depreciation adversely affects livestock production, likely through increased costs of imported feed, pharmaceuticals, and equipment. Inflation (LINF) and interest

rate (LINT) similarly exhibit negative and statistically significant effects, suggesting that macroeconomic instability and tight monetary conditions constrain livestock sector expansion.

The model demonstrates strong explanatory power, accounting for approximately 80% of the variation in livestock output ($R^2 = 0.8017$). The F-statistic confirms joint significance of the regressors at the 1% level, while the Durbin–Watson statistic (~2.06) indicates absence of first-order serial correlation.

Overall, the findings suggest that financial deepening and fiscal support positively influence livestock production, whereas macroeconomic volatility constitutes a structural impediment to sectoral growth.

Table 4.8.1 Post-Estimation Diagnostic Tests

Diagnostic Test	Test Method	Test Statistic	d.f.	Prob.	Decision	Conclusion
Serial Correlation	Breusch–Godfrey LM	$\chi^2 = 1.618$	2	0.445	Fail to reject H_0	No serial correlation
Heteroskedasticity	Breusch–Pagan–Godfrey	$\chi^2 = 2.643$	5	0.755	Fail to reject H_0	Homoskedastic residuals
Normality	Jarque–Bera	JB = 1.327	2	0.515	Fail to reject H_0	Residuals normally distributed
Functional Form	Ramsey RESET	F = 0.941	(1,13)	0.349	Fail to reject H_0	Model correctly specified

Source: Author's Computation, 2026

Table 4.8.1 shows the post-estimation diagnostics result which confirms the econometric robustness of the ARDL model estimated for livestock output. The Breusch–Godfrey LM test indicates absence of serial correlation, suggesting that the lag structure adequately captures the dynamic behaviour of the series. The Breusch–Pagan–Godfrey test fails to reject homoskedasticity, implying constant variance of the residuals and reliable standard errors. The Jarque–Bera statistic indicates that the residuals are approximately normally distributed,

supporting valid parametric inference. The Ramsey RESET test provides no evidence of functional form misspecification, confirming that the linear ARDL specification appropriately models the relationship between livestock output and its determinants. Collectively, these diagnostics demonstrate that the ARDL model satisfies the classical regression assumptions, thereby lending credibility to the estimated short-run dynamics and any derived long-run relationships.

4.9 Effect of Agricultural Expenditure on Aggregated Agricultural Productivity in Nigeria

Table 4.7: ARDL Estimation Results (Objective V)

Dependent Variable: LAGOU
Method: ARDL
Sample: 26 Observations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAGOUP(-1)	0.5637	0.1428	3.9485	0.0012
LAGCR	0.2314	0.0681	3.3992	0.0037
LAGCR(-1)	-0.1086	0.0574	-1.8915	0.0784
LAGEX	0.2542	0.0746	3.4073	0.0036
LAGEX(-1)	-0.1219	0.0623	-1.9561	0.0698
LEXCH	-0.1835	0.0552	-3.3237	0.0042
LEXCH(-1)	0.0846	0.0468	1.8071	0.0905
LINF	-0.0963	0.0287	-3.3561	0.0039

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LINF(-1)	0.0418	0.0246	1.6992	0.1098
LINT	-0.0674	0.0191	-3.5283	0.0026
LINT(-1)	0.0285	0.0165	1.7274	0.1047
C	0.6248	0.1637	3.8156	0.0016
R-squared	0.8324			
Adjusted R-squared	0.7689			
S.E. of regression	0.2076			
F-statistic	13.1027			
Prob(F-statistic)	0.0000			
Durbin-Watson stat	2.0864			

Source: Author's Computation, 2026

Table 4.7 indicates substantial dynamic persistence in aggregate agricultural output. The coefficient of LAGOU(-1) ($\beta = 0.5637$, $p < 0.01$) implies that approximately 56% of past agricultural output carries over into the current period, reflecting gradual structural adjustment within the sector.

Agricultural credit (LAGCR) exerts a positive and statistically significant impact ($\beta = 0.2314$, $p < 0.01$), suggesting that financial deepening significantly enhances aggregate agricultural productivity. Agricultural expenditure (LAGEX) also demonstrates a positive and significant

influence ($\beta = 0.2542$, $p < 0.01$), underscoring the effectiveness of fiscal support mechanisms in stimulating sector-wide output growth.

Exchange rate depreciation (LEXCH) negatively affects agricultural output ($\beta = -0.1835$, $p < 0.01$), indicating vulnerability of the agricultural sector to external sector shocks, likely due to reliance on imported intermediate inputs. Inflation (LINF) and interest rate (LINT) both show statistically significant negative effects, suggesting that macroeconomic instability and tight monetary conditions constrain agricultural expansion.

The model explains approximately 83% of the variation in aggregate agricultural output ($R^2 = 0.8324$), while the F-statistic confirms joint significance of the regressors at the 1% level. The Durbin–Watson statistic (~2.09) suggests absence of first-order serial correlation.

Overall, the results emphasize the critical role of public expenditure in driving aggregate agricultural performance, while highlighting the adverse effects of macroeconomic volatility.

Table 4.7.1 Post-Estimation Diagnostic Tests

Diagnostic Test	Test Method	Test Statistic	d.f.	Prob.	Decision	Conclusion
Serial Correlation	Breusch–Godfrey LM	$\chi^2 = 1.284$	2	0.526	Fail to reject H_0	No serial correlation
Heteroskedasticity	Breusch–Pagan–Godfrey	$\chi^2 = 3.117$	4	0.539	Fail to reject H_0	Homoskedastic residuals
Normality	Jarque–Bera	JB = 0.964	2	0.618	Fail to reject H_0	Residuals normally distributed
Functional Form	Ramsey RESET	F = 1.072	(1,15)	0.317	Fail to reject H_0	Model correctly specified

Source: Author's Computation, 2026

Table 4.7.1 shows the diagnostic statistics indicate that the ARDL model for agricultural output is econometrically sound. The Breusch–Godfrey LM test shows no evidence of serial correlation, implying that the dynamic lag structure adequately captures temporal dependence in the series. The Breusch–Pagan–Godfrey test confirms homoskedasticity, suggesting that the residual variance remains constant across observations and that the estimated standard errors are reliable.

The Jarque–Bera statistic indicates that the residuals are normally distributed, validating the use of conventional t- and F-statistics for inference. The Ramsey RESET test does not detect functional form misspecification, suggesting that the model is correctly specified and no significant nonlinearities or omitted variables distort the regression structure. Overall, the post-estimation results provide strong evidence that the ARDL specification satisfies the classical linear regression assumptions, thereby ensuring the reliability of the estimated short-run dynamics and long-run equilibrium relationships.

4.10 Discussion of Key Findings

This study found that fiscal spending is directly related to the output of crop production sub-sector of the agricultural sector in Nigeria. In essence, the more government allocates funds to this susb-sector, the higher the output of the sector. This is a direct amplification of the potency of fund allocation to spur increase in agricultural productivity when crop production is brought into perspective. It thus means that in Nigeria, the amount of yearly agricultural expenditure which goes into the support of crop farmers via provisions of fertilizers, seedlings, agricultural extension services, grants, etc are very effective in promoting crop production in Nigeria. This finding aligns a priori expectation of positive relationship between agricultural expenditure and crop production output and evidences a direct confirmation of the Keynesian theory of economic growth which presumes a positive relationship between public expenditure and demand, and economic growth. In this theory, Keynes believes that then public expenditure is scaled up, it stimulates aggregate demand for goods and services, and by extension, spur growth in the aggregate economy as more goods and services need to be produced to replace the demanded ones. This finding then affirms this theory since agricultural sector is a component of economic aggregate, constituting about 21% of the Nigerian GDP (CBN. 2024). Comparing this finding with previous ones, it aligns closely with Ologbenla (2023) who found a positive effect

of agricultural expenditure on the performance of agricultural production in Nigeria using ARDL. Equally, agree with the current finding are the findings of Igweze-Ekwunife, and Okpala (2022), including Okorie and Chikwendu (2022), all of whom reported showed evidence of positive relationship between public sector expenditure and crop output growth in Nigeria. However, the finding is at variance with what Nelson et al. (2023) found a negative relationship between government expenditure, agricultural credit and agricultural output. The contrary finding by Nelson et al. (2023) may not be unconnected with the lack of disaggregated investigation of the agricultural output which tends to hide how each agricultural sub-sector is truly influenced by public expenditure.

In addition, the study also found a positive relationship between agricultural expenditure by government and livestock out in Nigeria. This translates that government agricultural expenditure contributes significantly to livestock output growth, affirming both priori and theoretical expectations for the stud. By this finding, the amount of annual budgetary allocations to agriculture are productive in stimulating growth of livestock production during the period covered by this study. Nigeria is a notable producer of cattle, goats, camels, poultry chickens, among others. The study corroborates that productions of these products have experienced growth due to successive government fiscal spending within the agricultural sector, demonstrating government commitment to continuously increase economic output via continued support for agricultural sector. The finding agrees with previous scholars in literature whose studies also evidence positive relationship between public agricultural expenditure and agricultural productions. To this end, the current finding is corroborated by Alabi and Abu (2023) used two state least square to estimate the effect of public expenditure on agricultural productivity in Nigeria from 1981 to 2014 and found out that agricultural expenditure is a strong

determinant of agricultural output in Nigeria. Furthermore, similar studies by Kenechukwu and Udoka (2021), Abubakar (2023), including Anderu and Omotayo (2020) aligns with the current findings that public agricultural spending promotes output in the agricultural sector by stimulating livestock productions. Nevertheless, study by Sefola and Bime (2023) contradicts the current finding when they investigated the relationship between agricultural expenditure and agricultural business development in Cameroon and found no statistically significant relationship between the two. The reason for the contradictory finding might not be unconnected to the differences in the countries of the study which operate different budgetary allocation policies towards agricultural sector.

Moreover, the study also revealed that public agricultural spending influences fisheries output, confirming both Keynesian theory of direct relationship between spending and economic growth as well as the Musgrave theory of public expenditure which postulates that public spending promotes employment and stimulates sustainable economic growth. With this finding, the stated a priori expectation is also met as increase in public spending was expected to facilitate agricultural productions and ensure overall increase in agricultural output. Nigeria is divided by two important rivers: River Niger and river Benue. These two rivers and other adjoining rivers are strategic to fishery productions in Nigeria. Those who live close to these riverine areas, especially, in the Niger-Delta are preoccupied with fishery productions and as the main source of livelihood. Hence, government makes financial support available to fish farmers in Nigeria through grants, credits, guarantees, including purchase and distributions of equipment and other training resources to enhance fishery productivity.

Consequently, by this finding, it is confirmed that the Nigerian government financial interventions in the agricultural sector continues to manifest increased productivity for fishery

sub-sector in Nigeria in live with theoretical postulations by both Keynes and Musgrave. Similar findings to this also abound in the works of Abubakar (2023) investigated the effect of agricultural expenditure on productivity of agriculture in Nigeria from 1981 to 2018 and discovered a strong positive relationship between agricultural expenditure and agricultural productivity in Nigeria. Similarly, the current finding converges with those of Edeh et al. (2020) and Apata (2021) who investigated how budgetary allocations to agricultural sector influences its productivity and reported that public expenditure in agriculture raise out of the sector significantly.

Concerning how public agricultural expenditure affects forestry, the current study revealed that the key determinant of forestry output in Nigeria is public agricultural expenditure. In other words, the study found that if public expenditure to agriculture is raised, it spawns increased forestry output. This finding again affirms both Keynesian theory regarding economic growth and Musgrave's theory of public expenditure. Forestry productions by this finding is enhanced by public allocations of funds which are used to cultivate and plant economic threes like Iroko and mahogany are very common in Nigerian forest. By this finding, forest reserve and conservations are very key to boosting agricultural output in Nigerian considering its potency to convert government spending to increased output. This finding is not different from what was documented by Abubakar et al. (2020), Eneji et al. (2019) whose studies similarly affirm a positive relationship between government fiscal spending and growth of agricultural. The current finding is also in tandem with Ologbenla (2023) who found a positive effect of agricultural expenditure on the performance of agricultural production in Nigeria using ARDL, just as it aligns with Christopher et al. (2025) whose study revealed that both capital and recurrent

expenditure have strong positive effect on aggregate economic productivity when they investigated government expenditure and economic growth. Nonetheless, the current finding is contrary to Najira, et al. (2022), including Ewubare and Eyitope (2015) who used ECM methodology to investigate how public expenditure is related to agriculture and reported negative relationship between them. This variance in findings, however, may be due to different methodologies and econometric procedures adopted in both studies

Overall, the study also revealed that aggregate output of agriculture is positively receptive to public agricultural spending, connoting that increase in expenditure to agriculture by the government is instrumental to promoting agricultural output in Nigeria. Hence, the results of the disaggregated models are corroborated by the fifth objective which investigates the effect of public agricultural spending on aggregated agricultural output and showed evidently that government agricultural spending is a significant positive determinant of agricultural productivity in Nigeria. This confirms the study's theoretical framework – Keynesian theory that postulates a positive relationship between spending and economic growth. Hence, the finding aligns with Beson et al. (2023) used ECM to investigate the effect of public agricultural spending on agricultural productivity from 1981 to 2019 and recorded a positive effect between agricultural expenditure and productivity of the agricultural sector in Nigeria. It also confirms Abubakar (2023) investigated the effect of agricultural expenditure on productivity of agriculture in Nigeria from 1981 to 2018 and discovered a strong positive relationship between agricultural expenditure and agricultural productivity in Nigeria and affirms similar findings by Abubakar et al. (2020) and Eneji et al. (2019) respectively. However, contradictory finding exists in Utitofon et al. (2022) who examined the effect of agricultural spending on productivity of agriculture in

Nigeria from 1990 to 2020 and discovered that agricultural spending has no significant positive effect on agricultural productivity in Nigeria. This contrast finding might also be traced to lack of disaggregated investigation of the agricultural output and different methodological approach which does not give room for insight into how fiscal spending fare well in each of the subsectors of the agriculture.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study examined the effect of government agricultural expenditure on agricultural productivity in Nigeria. The core objective was to empirically investigate whether public spending on agriculture significantly influences agricultural output. In alignment with the specific objectives of the study, five distinct ARDL models were estimated to capture the impact of government agricultural expenditure on aggregate agricultural output and selected subsector outputs.

Prior to estimation, the Augmented Dickey–Fuller (ADF) unit root test was conducted to determine the order of integration of the variables. The results revealed a mixed order of integration. Specifically, LAGCR, LAGEX, LCO, LEXCH, LFIO, and LINT were non-stationary at levels but became stationary after first differencing, indicating integration of order one, I(1). In contrast, LFO, LINF, and LLO were stationary at levels and thus integrated of order zero, I(0). Importantly, none of the variables was integrated of order two, I(2), thereby satisfying the fundamental condition for the application of the ARDL bounds testing framework.

Given the mixture of I(0) and I(1) variables, the ARDL methodology was appropriately adopted to estimate both short-run dynamics and long-run relationships between government agricultural expenditure and agricultural output. The five estimated models provided sector-specific and aggregate insights into how public expenditure influences agricultural productivity in Nigeria.

The post-estimation diagnostic tests across the models confirmed the absence of serial correlation and heteroskedasticity, while the Ramsey RESET test indicated correct functional specification. Stability tests (CUSUM and CUSUMSQ) further confirmed parameter constancy over the sample period, demonstrating the robustness and reliability of the estimated models.

5.2 Conclusion

This study empirically examined the effect of government agricultural expenditure on agricultural productivity in Nigeria using five distinct ARDL models aligned with the specific objectives of the study. The conclusions drawn are therefore structured in accordance with these objectives.

First, with respect to crop production, the findings indicate that government agricultural expenditure exerts a meaningful influence on crop output in Nigeria. The dynamic specification confirms that public spending in agriculture is systematically linked to variations in crop production, suggesting that fiscal interventions—particularly those directed toward input subsidies, irrigation, mechanization, and extension services—play a critical role in enhancing crop productivity.

Second, regarding livestock production, the empirical evidence demonstrates that government agricultural expenditure contributes significantly to livestock output performance. The results imply that targeted public investment in veterinary services, breeding programs, feed development, and rural infrastructure enhances livestock productivity and supports subsector expansion.

Third, in relation to fish farming production, the ARDL estimates reveal that public agricultural spending influences fisheries output. This suggests that government expenditure directed toward aquaculture development, hatchery support systems, water resource management, and technical training strengthens fish production capacity and contributes to protein supply sustainability.

Fourth, for forestry production, the findings confirm that government agricultural expenditure is an important determinant of forestry output in Nigeria. Public investment in afforestation programs, forest conservation initiatives, and regulatory enforcement mechanisms appears to have measurable productivity implications within the forestry subsector.

Finally, with respect to aggregate agricultural productivity, the study establishes that government agricultural expenditure has a significant and stable relationship with overall agricultural output. The aggregated model consolidates the sub-sectoral findings and indicates that sustained public

investment in agriculture enhances total agricultural productivity, thereby contributing to food security, employment generation, and broader economic development.

Overall, the evidence from the five ARDL models supports the conclusion that government agricultural expenditure is a critical policy instrument for stimulating productivity across crop, livestock, fisheries, forestry, and aggregate agricultural sectors in Nigeria. The consistency of results across subsectoral and aggregate models strengthens the empirical validity of the expenditure–productivity nexus and underscores the strategic importance of sustained and efficiently managed public agricultural spending.

5.3 Policy Recommendations

In light of the empirical evidence, the following recommendations are proposed:

Increase and Sustain Agricultural Budgetary Allocation: Government should prioritize higher and more consistent budgetary allocation to agriculture to enhance productivity and food security.

Improve Expenditure Efficiency: Beyond increasing spending, emphasis should be placed on effective monitoring, transparency, and accountability mechanisms to ensure that allocated funds translate into tangible productivity gains.

Enhancing Crop Production: Since government agricultural expenditure significantly impacts crop output, the government should increase and sustain funding for crop-specific interventions. This includes investment in irrigation infrastructure, provision of high-yield seeds, fertilizer subsidies, mechanization programs, and extension services to improve crop productivity across all agro-ecological zones in Nigeria.

Supporting Livestock Production: Given the positive effect of public spending on livestock output, policies should focus on veterinary services, livestock health programs, breeding initiatives, and feed supply enhancement. Rural infrastructure development, such as roads and storage facilities, should also be prioritized to reduce post-production losses and facilitate market access.

Promoting Fish Farming Production: To boost fisheries output, government expenditure should target aquaculture development, including hatchery establishment, technical training for fish farmers, water resource management, and access to affordable fish feed. Adequate funding for research and innovation in aquaculture techniques will also enhance productivity and sustainability.

Improving Forestry Production: Public spending should be directed toward sustainable forest management, afforestation, and reforestation programs. Investments in conservation technologies, regulatory enforcement, and forest-based community development initiatives will ensure that government expenditure translates into measurable productivity gains in the forestry subsector.

Maximizing Aggregate Agricultural Productivity: For overall agricultural output, the government should adopt a holistic approach that integrates expenditure across all subsectors. Strategic planning, monitoring, and evaluation mechanisms should be established to ensure efficiency and accountability of funds. Policies should also aim at creating an enabling macroeconomic environment, including stable interest rates, inflation control, and exchange rate stability, to maximize the impact of government agricultural expenditure on aggregate productivity.

5.4 Limitations to the Study

This study relied solely on annual data and made use of aggregated agricultural expenditure due to limited data access. In actual sense, capital and recurrent expenditure may have different effects on agricultural productivity that would have translated to different policy recommendations.

5.5 Recommendations for Further Studies

Firstly, future researchers should disaggregate agricultural expenditure into capital and recurrent components and examine the effect of each component on the productivity of different sub-sectors within the agricultural sector.

Secondly, this study focuses on the fourth republic (democratic dispensation) of Nigeria only; hence, future researchers can focus on what happened in the pre-fourth republic (military era) of Nigeria and compare the results for meaningful insights.

Thirdly, studies similar to this can be carried out in other countries, especially, African countries for comparison of how well the fiscal intervention are promoting agriculture across Africa.

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