Efficacy of Formal Versus Informal Sources of Financing Agricultural Growth and Development in Nigeria

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This study examines the relative efficacy of formal and informal financing sources in driving agricultural growth and development in Nigeria. Specifically, it seeks to determine which category—formal or informal—contributes more significantly to agricultural production and how individual component sources within these categories affect agricultural activities and how these sources can be effectively marketed to the agricultural sectors and the farmers. The study employs statistical techniques, including the T-test, Satterthwaite-Welch t-test, ANOVA F-test, and Welch F-test, to test relevant hypotheses. The results reveal that both formal and informal financing sources significantly impact agricultural growth, with farmers perceiving these sources as effective in supporting agrarian activities. Among informal sources, personal savings, family/village fund pools, and rotational credit schemes (Isusu/Ajo) emerge as the most influential, while among formal sources, commercial banks, the Bank of Agriculture, and the World Bank Group play the most vital roles. However, government financing is deemed suboptimal in fostering agricultural development. The study recommends that government policies should incentivize and strengthen the role of commercial banks, development banks, and international financial institutions in agricultural financing to sustain and expand their contributions to the sector.

Keywords: formal and informal credit sources, institutional financing, agricultural production, agricultural credit, agricultural marketing, Nigeria

INTRODUCTION

Background of Study

Access to and availability of credit have been viewed by expert analysts and economic commentaries as important icons of accelerated and veritable agricultural production and by extension, aggregate national production. Thus, agricultural financing becomes a crucial driver of growth in agricultural output as well as national production output. Succinctly put, to achieve maximized output in the agricultural sector, concerted funding is indispensably implicated. By extension, to attain possible maximum gross domestic product, a good dose of cherished funding is needed. This view-point is consistent with the development finance theorists that contends that not only does finance leads growth, but it is equally a causal vector determining growth of the general economy and those of its sub-sectors, such as agriculture. Many empirical studies provide satisfactory support for this theorizing the finance leads growth.

The contrarians of the above development finance theory argue that even though finance is important in the national scheme of things, it does not necessarily lead-growth, but the opposite submission that production, output and associated growth leads and drags finance on the part of causality. To them, the very need for finance is derived from the need for increased production, output and growth. Thus, output growth dictates the need for increased financing at any point of the production process. Invariably, causality is expected to flow from output growth to finance, and not vice versa. There are studied that lend credence to this contention.

Further still, there is a middle-of-the-road argument on the finance-growth nexus. These theorists believe that on the line of a continuum of causality, some sectors of the economy, under certain prevailing economic conditions, would provide support for finance leading growth, while other sectors may provide evidence of output-growth leading finance. In a balance of probability, what eventually occurs for the macroeconomy would be a function of the aggregate of what obtains in the various sectors. If the 'magnitude' and 'quantum' of performance of sectors that provide evidence for the finance-leading-hypothesis outweighs those that provide support for growth-leading-thesis, the resulting macroeconomic outcome would be that of finance leading aggregate output growth, while the converse is true. This school of thought also posits that, in a good number of cases, there could be dual outcomes, i.e., bi-causality, where causality would flow from finance to growth, as well as from growth to finance. This dual-causality thesis, it is argued, can result even at the sectoral levels.

No matter the theoretical leaning, it is noteworthy that role of adequate funding in both sectoral and macroeconomic growth and development cannot be explained away; as money does really matter as argued by the neo-classicals, and money is actually the only thing that matters in real economic causation, submitted by the monetarist (Ezirim, 2005). Against this meniscus, agricultural funding is sine qua non as far as output growth and development is concerned, both at the sectoral and national levels. Access to funds would promote the productive activities of farmers and other practitioners in the industry. Funding sources must be readily available and easily accessible. Credit facilities, at least, must be provided by relevant and responsible financiers. Other interventions that benefit farmers such as grant-in-aid and subsidies are equally implicated.

In Nigeria, the public sector (the government and its relevant agencies) and the private sector institutions appear to be in concerted partnership in funding farmers and other stake-holders of the agricultural sector of the economy. The government has been known to make budgetary provisions for both capital and recurrent expenditures to agriculture. Through these provisions, money is allotted and made available to finance its programs and interventions in the sector. Money is also made available for the purposes of establishing and funding the activities of its agencies in the sector. The private sector institutions participate in funding by way of granting loans and advances to farmers and allied practitioners. In some cases, the government guarantees some of the private-sector lending. Among the private sector institutions, some have their origin and character enroot the traditional financial system, where notable financial institutions operate.

Ezirim (2005) indicates that it is easy to distinguish between institutional and non-institutional sources, governmental and non-governmental sources, modern and traditional sources, domestic and international

institutional sources, formal and informal sources, and conventional and non-conventional sources of funds for the agricultural sector. It is important to empirically determine which of the funding sources best serve the purposes of agricultural output maximization and development. It is also a worthy objective to unravel which sources contribute significantly or otherwise to the boosting of aggregate output of the country, since there is an anticipated positive link between agricultural production and aggregate production.

In the present work, particular attention is paid to the array of formal and informal sources of funds for agriculture and their distinguishable impacts of agricultural and aggregate national output. The formal sources include the government and its government agencies, modern financial institutions (domestic and international), and cooperatives registered under the relevant ministries in the country. Such formal agencies would consist of the government agencies and cooperatives, development banks (domestic and international), commercial banks, microfinance banks, and finance houses. The informal sources comprise the various personal efforts (savings) and the traditional financial institutions operating in the rural and, at times, in the urban communities. These would include personal savings, family/village fund pools, local money lenders, isusu, local savings agencies (Akawo), age grade associations, social clubs, and contributory meetings (Ajo) (Ezirim, 2005). It is not yet clear which of the categories (formal versus informal) affect agricultural and, by extension, national production most. It is also not yet fully determined whether or not the individual sources listed above actually have any significant independent influence both sectoral and aggregate output. These are some of the issues which this study seeks to resolve.

Objectives and Hypotheses

A major objective of this research is to explore which category of sources of funds - formal or informal – that contribute more substantially to agricultural production, growth, and development in Nigeria. It is also a critical objective to determine whether or not the individual component sources, actually affect agricultural production, growth, and development in Nigeria, and to what extent? Thus, the following hypotheses are offered:

Hypotheses 1: *There is no significant difference between the effectiveness of formal sources and that of informal sources of funds for farmers.*

Hypotheses 2: *There is no significant difference between the effectiveness of modern and traditional financial institutions as sources of funds for farmers.*

CONCEPTUAL, THEORETICAL AND EMPIRICAL ISSUES

Concept of Agricultural development

Agricultural development is basically an arm of the overall national development, which involves concerted improvements in the principles, processes, practice, and resulting outcomes of agricultural sector, given both human and material resources, which will bring about maximum output from a combination of minimum inputs (Olawoye and Ogunfiditimi, 1989; Alahira, 2020). A developed agriculture industry may amount to a developed food infrastructure and food security foundations for a country. It would include a well improved, modernized and technology-driven systems of planting, harvesting, breeding, processing, and allied activities aimed at making sure that agricultural output is well boosted in an increasing and sustainable manner. Developing agriculture translates to developing allied industries that facilitate agricultural processes. For instance, transportation and communication are key components to agricultural development. Infrastructural development is incidental to agricultural development. Health sector development derives from agriculture development, more or less. For some commentaries, agriculture development implies **giving assistance to farmers or crop producers** by providing them various agricultural support (BYJU'S Learning, 2021). This suggests that when farmers and other practitioners receive optimal support that contributes to improved sector performance, agriculture experiences development. Likewise, ensuring adequate security, supporting research, adopting advanced techniques,

controlling pests, and promoting diversity are all considered aspects of agricultural development (BYJU'S Learning, 2021).

Terzo (2021) maintained that "agricultural development promotes the proper conditions for farming so that planting, harvesting and processing of crops can be done effectively, which ultimately can reduce poverty and save lives". Solving the problems confronting farmers and other participants in the agriculture industry is where agricultural development and government funding comes into play. Agricultural development encompasses not only the physical conditions of farming but also advances in research, technology, and political policy. In many developing nations, progress in agriculture remains constrained without substantial investment aimed at improving harvesting conditions. Nevertheless, numerous endowments and foundations dedicate significant financial resources to enhancing agricultural practices and infrastructure in these regions (Terzo, 2021).

The National Geographic Society (2019) states that dating back to the past 12,000 years, "agriculture triggered such a change in society and the way in which people lived that its **development** has been dubbed the " Neolithic Revolution." Imagine the traditional hunter-gatherer lifestyles, followed by humans since their evolution, being swept aside in favor of permanent settlements and a reliable food supply.

Terzo (2021) states that agricultural development extends beyond the physical conditions of farming to encompass research, technology, and political policy. Technological advancements in agriculture can enhance crop yields for smallholder farmers by enabling them to utilize their land more efficiently and sustainably. Proper water purification systems coupled with quality seeds, fertilizers and soil are all necessary for a bumper crop, and all of these components can be enhanced through technological developments. These advancements could have widespread benefits, ranging from higher profits for a farmer to declines in poverty levels and more generally, economic growth at both the micro and macro quarters (Terzo, 2021).

Agricultural finance and financing Conceptualized

Murray (1953), as cited in Gomal Agriculture Journal (2021), defined agricultural finance as "an economic study of borrowing funds by farmers, the organization and operation of farm lending agencies, and of society's interest in credit for agriculture." Similarly, Tandon and Dhondyal (1962), also cited in Gomal Agriculture Journal (2021), described agricultural finance as "a branch of agricultural economics, which deals with financial resources related to individual farm units."

The literature distinguishes between macro- and micro-level perspectives in agricultural finance. According to Gomal Agriculture Journal (2021), macro-agricultural finance addresses the broader financial architecture supporting the agricultural sector, including sources of funding, lending procedures, regulatory frameworks, and oversight of agricultural credit institutions. It focuses on the overall credit requirements of the sector, the terms and conditions under which credit is available, and strategies for deploying these funds to facilitate agricultural development. In contrast, micro-agricultural finance pertains to the financial management practices of individual farm enterprises. It involves understanding how farmers assess various credit sources, determine optimal borrowing levels, allocate funds among alternative uses within their operations, and plan for the future utilization of financial resources (Gomal Agriculture Journal, 2021).

SIGNIFICANCE OF AGRICULTURAL FINANCE

According to Gomal Agriculture Journal (2021), agricultural finance holds significant importance for several reasons. First, it plays a crucial role in the agro-socio-economic development of a country, influencing both macro- and micro-level outcomes. Second, agricultural finance serves as a catalyst for strengthening farm businesses and enhancing the productivity of scarce resources. For example, the combination of newly developed, high-potential seed varieties with purchased inputs such as fertilizers and plant protection chemicals, when applied in appropriate proportions, can substantially improve yields. Third, access to financial resources enables farmers to adopt new technological inputs, thereby contributing to increased agricultural productivity. Furthermore, Gomal Agriculture Journal (2021) identifies several additional roles of agricultural finance. Fourth, investment in on-farm assets and supporting infrastructure

through large-scale financial initiatives contributes to increased farm incomes, thereby improving the standard of living for rural populations. Fifth, agricultural finance can help reduce regional economic disparities and mitigate variations in assets and wealth among farms. Sixth, agricultural finance functions as a lever with both forward and backward linkages to economic development at both micro and macro levels. Seventh, given that agriculture in many regions remains traditional and subsistence-oriented, financial resources are essential for developing the infrastructure required to facilitate the adoption of new technologies. Finally, substantial investments are necessary to implement major and minor irrigation projects, expand rural electrification, establish fertilizer and pesticide production facilities, and support agricultural development and poverty alleviation programs across the country.

Concept of Agricultural Credit

Hillagric (2021) explained that "credit is based up on belief, confidence, trust and faith"; and refers to a loan or advance; representing a "certain amount of money provided for certain purpose on certain conditions with some interest, which can be repaid sooner (or) later". Galbraith, quoted by Hillagric (2021), sees credit is the "temporary transfer of asset from one who has to other who has not". This is equally the way credit is referred to as in Agriculture, representing the money advanced to farmers and other agriculturalists for the purposes of enhancing their production capabilities. Agricultural credit is needful, being one of the most crucial inputs in all agricultural development programs. Traditionally, the main source of agricultural credit was the private money-lenders, with other traditional financial institutions augmenting. But these sources of credit proved inadequate, highly expensive and exploitative, over time; and thus, necessitating the intervention of modern sources of credit such as cooperatives, commercial banks, micro-finance and rural banks, and development banks. These modern institutions tend to have made credit more available, cheaper, timely and adequate to farmers. They have provided farmers with a wide range of financial assistance covering such purposes as (1) Buying agricultural inputs like seeds, fertilizers, plant protection chemicals, feed and fodder for cattle etc. (2) Supporting their families in those years when the crops have not been good, through consumer, personal and other tailor-made loans. (3) Buying additional land, to make improvements on the existing land, to clear old debt and purchase costly agricultural machinery. (4) Increasing the farm efficiency as against limiting resources i.e., hiring of irrigation water lifting devices, labor and machinery (Hillagric, 2021).

Classification of Agricultural Credit

According to Hillagric (2021), agricultural credit can be broadly classified based on several criteria, one of which is the duration of the repayment period. From this perspective, agricultural loans are categorized as short-term, medium-term, and long-term. Short-term loans, which typically have a repayment period ranging from 6 to 18 months, include most crop loans and advances. Notably, the exact repayment period often varies depending on the duration of the specific crop cycle. Farmers utilize short-term credit to cover expenses associated with ongoing agricultural operations, such as seed sowing, fertilizer application, plant protection measures, and wages for casual laborers. These loans are generally expected to be repaid using the proceeds from the sale of the harvested crops.

The second category are the medium – term agricultural loans that necessitated repayment period ranging from 18 months to 5 years. These loans are created to meet farmers' requirements to bring about some needed improvements on their farms through purchasing farm implements, electric motors, milch cattle, sheep and goat, etc. The time-duration of these term-loans is relatively longer in view of their partially-liquidating nature. Long – term agricultural loans are usually those whose repayment periods fall between 5 and 20 years or even more. Together with medium-terms loans, they are called investment loans. These loans are usually meant to be channeled to uses for permanent improvements like levelling and reclamation of land, construction of farm buildings, purchase of tractors, raising of orchards, and such the like. These kinds of activities require large capital outlay are thus, require longer repayment period since they are usually non-self-liquidating in nature.

Classification can also be based on purpose, where credit is sub-divided into at least 4 types namely (a) production loans referring to the credit given to the farmers for crop production and are intended to increase

the production of crops. They are also called loans for seasonal agricultural operations (LSAO). They are usually short–term loans or simply, crop loans. The second type is called agricultural investment loan, which are loans given for purchase of equipment such as tractors, pump-sets, tube wells, etc. There are the agricultural marketing loans, which help the farmers in overcoming distress sales and to market their produce in a better way. They are designed to assist farmers clear-off their debts and dispose the produce at remunerative prices. Advance against produce and warehouse receipts fall under this category. Consumption loans is yet another type of loan in the purpose-classification. Thus, any loan granted the farmers for some purpose other than production come under consumption loan. They may appear unproductive at first sight but they indirectly help in more productive use of the crop loans. When they are available the temptations to divert production loan draw-down become reduced.

Based on security, agricultural loans can be classified into secured and unsecured loans. Secured loans are those advanced against some security or collateral provided by the borrower. Various forms of securities are offered in obtaining the loans, including personal security (where the borrower becomes his own personal guarantor; loan, here, is usually advanced against or accompanied by the farmer's promissory note and or post-dated cheque), third party guarantee (where another party guarantees the loan), collateral security (where property is used to secure a loan). Such property may be unmovable like landed property or movable properties like insurance policies, stocks and shares, fixed deposit bonds, warehouse receipts, machinery, and livestock.

Agricultural Financing Options and attendant issues

Financing agriculture takes a public-private involvement approach. Both the government and the private sector, notably financial institutions, actively participate and cooperate in funding agriculture in Nigeria. The financial institutions can be classified into modern and traditional financial institutions. The modern institutions comprise domestic banking institutions and international development finance institutions. The traditional finance institutions join forces with the government and modern financial institutions in attempt to finance agricultural production and eventual development. The review, here, starts with the financial institutions.

Agriculture Financing from Modern Nigerian financial institutions

Alahira (2020) classified between **agricultural** funding from formal and informal sources. Formal sources include the Bank of Agriculture (BOA), commercial banks, agricultural cooperatives, microfinance banks, and bank of industry (BOI). Owned by the federal Government through shareholding by the Central Bank and Ministry of finance, BOA provides the first line of agricultural funding in the form of credit or loans to both small and medium-scale farmers within rural areas. Commercial Banks are known to assist farmers by way of lending. They are so important in agriculture lending to farmers through the instrumentality of agricultural credit guarantee scheme funding. Commercial banks lend to both individuals and cooperatives for agricultural purposes (Ezirim, 2005).

The Bank of Industry (BOI**)** are also known to lend and fund agricultural businesses that are engaged production and processing of agricultural products, and thus, contributes its own quota in agricultural growth and development of the country (Alahira, 2020). At the level of smaller rural farmers and small agribusinesses, microfinance companies and finance houses are not left out in lending to these classes of borrowers. A times, poorer farmers had to depend on these micro-institutions for bridge and personal consumer loans so as not to divert main agricultural loans from the bigger banks (Ezirim, 2005). Coursescholars (2021) reports that since 1974, the Bank of Agriculture has committed $1. 2 billion for Agricultural Development Projects (ADPs) to increase farm production and welfare among smallholders in Nigeria.

Agricultural Co-Operatives provide another veritable source of cheap funds for the rural areas. Cooperatives usually involve a group of farmers that combine or pool resources in order to reap greater economies of scale or better market representation and power. In view their enormous co-op power, cooperatives reserve the advantage of acquiring loans for their members. Agricultural cooperatives, sometimes, serve as guarantors and intermediaries, assisting their members to secure funds from

commercial banks and other. Agricultural cooperatives also assist their members even in the marketing of produce from their farms (Alahira, 2020).

FINANCING BY INTERNATIONAL DEVELOPMENT FINANCIAL INSTITUTIONS

The International Fund for Agriculture Development (IFAD)

This is an international development financial institution that specializes in agricultural development of developing countries. It has its ultimate mission to invest in the poor, with the rural dwellers as its primary funding constituency. As in IFAD (2021), since 1985, IFAD has been Nigeria's trusted partner for reducing rural poverty. IFAD loans contribute to expanding outreach and enhancing impact by leveraging expertise in building the capacity, productivity, and market participation of rural populations. Consistent with IFAD's Strategic Framework 2016–2025, the organization's approach promotes engagement in rural poverty reduction across all levels of government, establishes and strengthens farmers' organizations, and supports the empowerment of poor rural communities, with a particular focus on women and young people (IFAD, 2021).

IFAD's current strategy in collaboration with the Nigerian government covers the period from 2016 to 2021. The overarching goal is to foster a rural economy in which targeted populations can benefit from economic growth, guided by two strategic objectives: (a) promoting sustainable, climate-resilient economic development and financial inclusion for young people engaged in profitable agribusiness, and (b) strengthening institutions at the state and community levels to facilitate collaboration with private sector actors in key value chains. IFAD continues to work alongside the Nigerian government to build rural institutions, implement community-driven development initiatives, support the growth of profitable smallholder agribusinesses, and advance financial inclusion for rural poor households (IFAD, 2021).

The World Bank Group (WBG)

The World Bank, together with its associate institutions such and the International Development Association (IDA) and the International Bank Reconstruction and Development (IBRD) have, over the years, provided financial assistance to agriculture in Nigeria through funding a number of projects and lending to small Nigerian farmers. The World Bank Group (WBG) finances projects aimed at increasing agricultural productivity and production, enhancing processing and marketing, fostering job creation, and improving household income and livelihoods in participating states. These initiatives also support women and youth enterprises engaged in activities such as horticulture, poultry, and aquaculture. Since 1985, the World Bank has contributed to poverty reduction and improved living standards in Nigeria through more than 130 International Bank for Reconstruction and Development (IBRD) loans and International Development Association (IDA) credits.

In 2016 for instance, the World Bank was said to be running projects in the agriculture sector in Nigeria worth 1.5 billion dollars, in keeping with the Bank's strategy to end extreme poverty and boosting prosperity was through investment in agriculture. It was for the reason of the above strategy that the Bank dedicated 10 per cent of its total loan portfolio in Nigeria to Agriculture. According to the breakdown, the World Bank invested 495 million dollars in irrigation, 450 million dollars in its FADAMA development project and 150 million on other commercial agriculture projects (Oredipe, 2016).

Also, in 2017, for instance, the World Bank approved a $200 million credit to support the Nigerian agricultural sector, especially for small- and medium-scale farmers. The loan was designed to tackle the key constraints of the Nigeria agriculture sector, such as low productivity, lack of seed funds for establishing agro-processing plants, lack of access to supportive infrastructure, and low level of technology adoption and limited access to markets. "The number of project's direct beneficiaries is 60,000 individuals, 35 percent of which will be women. Overall, about 300,000 farm household members are indirect beneficiaries" (Ujah, 2017). The credit is financed from the International Development Association (IDA), the World Bank Group's grant and low-interest arm. It will be on standard IDA terms, with a maturity of 25 years, including a grace period of 5 years (Ujah, 2017). Benmessaoud (2017) opined that with due recognition to the fact that, "agriculture is key to long-term economic growth and diversification", WBG's financing

project supports the country's policy thrusts on food security, local production, job creation and economic diversification; and properly responding to the "recurring issues of low productivity, limited farmers' participation to agribusiness supply chains, and institutional realignment in the agricultural sector."

Agriculture Financing from traditional financial institutions

Informal funding sources include personal savings, money lenders, traders and buyers in the form of advance against produce, family or village funds' pools, age-grade associations, and 'isusu' contributory funds. Farmers, who save part of their farm revenue, surplus or income would have something to fall back to for future re-investments into their farms. These personal savings are considered cheap and interest-free, but usually not sufficient for future operations of small-scale farmers or farmers in rural areas, whose ability to save is limited to his scale of operations and income receipts. Some rural farmers have been known to use the services of local savings institution, popularly called 'Ákawo', who comes to them at regular periodic intervals to collect agreed or available sums of money out of what they earned from their farm proceeds. The 'akawo' practitioners would make the savings available to the farmers in-bulk when they need them. This service is usually for a little 'fee' or 'commission' deductible from the savings before handing them over to the farmer. In modern times, these 'akawo' experts have been known to lodge their takings with the commercial and microfinance banks for safety and small interest incomes, only to withdraw at the request of the savings' clients, the farmers (Ezirim, 2005).

Family or village funds' pool constitute another veritable source of 'interest-free' credit to farmers. Monies are put away from sale of lands, property, closures of individual-palm-fruits-cutting for a season in order to enable collective-cutting of the fruits to be kept in the family or village pools, and such others like fines, levies and donations. From these pools, credits are given to needy members of the family or village for their nominated businesses which are usually agricultural. The amount of credit advance to borrowing members depends on the size of the pool, agreed credit policies, and credit-worthiness of the member as well as the general willingness of the family or village to support the given borrower. Age-grade associations operate in similar ways, except that their funds derive mainly from the periodic contributions and donations of members and other allied avenues. Their credit policy is similar to the family or village funds' pool. Contributory savings and credit schemes like the renowned 'isusu' and other rotatory contributions schemes are also known to be handy in providing loans and making available due-contributions to their members as and when due. Farmers avail themselves of access to funds from these sources in order to ensure their production and associated operations (Ezirim, 2005; Alahira, 2020).

The **local money lenders** are always present in any society to meet short- and or medium-term financing needs of members of that society. Farmers are integral part of the rural societies, where this institution is predominant. Money lenders actually provide short- to medium-term loans to farmers and non-farmers alike, especially in rural areas. Credit from these local lenders is acquired at exorbitant rates of interest, with stringent and harsh repayment conditions. This is usually discouraging, but what would farmers do, when they don't alternative financing option? This makes the money lenders always relevant in most societies. The other financing source available to farmers is the advance-against-produce from traders and produce-buyers, who mimic banks in this sort of lending. They say to the farmers something like this: "go ahead and produce, we give you money to do that. We will receive our credit-money back from the farm-produce you will sell to us after harvest, in a short time from now." The initiative can come from the needy farmers themselves, and they usually take the initiative which is a form of loan proposition. No matter who takes the initiative to ask for credit, veritable short- to medium-term credits have been advanced to farmers through this channel for productive purposes. The notable condition is that the said farmers must sell the financed-produce to lending-traders and produce-buyer at harvest, and at the pre-determined agreed prices. It is usual for the agreed prices to be lower than the prevalent market prices at the time of harvest (Ezirim, 2005; Alahira, 2020).

The questions that ought to be asked and answered are: How important is Agricultural Funding? How important are these funding sources? In the parlance of Alahira (2020), agricultural funds are of utmost importance in the establishment and running of agricultural enterprises. Farmers are cardinal, here, to say the least. Agricultural funds can be used for the purchase or lease of farmlands, purchase of farm inputs like

fertilizer and insecticides, hiring and recruitment of farm labor, payment of incidental and recurrent expenses like maintenance and even fueling of machines, procurement of farm machinery and equipment like tractors and irrigation facilities, and expansion of farm activities, unto desired developmental levels.

Some Previous Empirical Studies

A number of previous studies are reviewed in this study that provide useful information for analysis and subsequent discussions. For example, Anetor, Ogbechie, Kelikume & Ikpesu (2016) studied the impact of the credit supply, and various commercial bank loan schemes on agricultural sector production using vector autoregressive (VAR) approach against time-series Nigerian data from 1981-2013. The study found that agricultural credit guarantee scheme funding (ACGSF) performed poorly in explaining agricultural sector performance, while commercial loans to agricultural sector significantly impacted on agricultural production. Ammani (2012) attempted to investigate the relationship between agricultural production and formal credit supply in Nigeria, employing "the development and estimation of three simple regression models relating agricultural output with formal credit while holding other explanatory variables constant". It was found that "formal credit is positively and significantly related to the productivity of the crop, livestock and fishing sectors of Nigerian agriculture". The recommendation was for the government to keep on encouraging the expansion of formal credit sources to reach as many farmers as possible (Ammani, 2012).

Iqbal, Ahmad & Abbas (2003) applied the OLS estimation of the production function to investigate the effect of institutional credits on agricultural production in Pakistan during 1980-81 to 1986-87 and after mid 1990's. The results revealed that institutional credit affects agricultural production positively. "Water availability at the farm gate, labor, and cropping intensity also affected agricultural output positively. The study equally observed that factors like floods, cotton leaf curl virus (CLCV), and drought caused significant disruption and reduction in agricultural output during certain years (Iqbal, Ahmad & Abbas, 2003). In a follow-up study, Izhar & Tariq's (2009) assessed the impact of institutional credit on agriculture production by estimating Cobb Douglas agricultural production function for the pre-reform (1972-91) and post-reform (1992-2005) period in India on the evidence of time-series data. They also examined the trends and patterns of institutional credit during pre-reform and post-reform period. It was observed that annual-average-growth-rate of institutional credit was plummeted most during the 1990-2000 period but was highest during 1971-80 period. The Cobb-Douglas production function estimates showed that institutional credit has significant impact on aggregate agricultural production in India for the pre reform period (1971-91), but not for the post-reform period, as institutional credit was not a significant argument in agricultural production in India.

Saravanan (2016) applied the Cobb-Douglas production function to determine the effect of institutional credit to agriculture GDP in India. The estimated model had agricultural GDP as the explained variable while institutional credit, net-irrigated area, consumption of pesticide and consumption of fertilizer were the explanatory variables. The findings indicated that both institutional credit and net-irrigated area were significant in affecting agricultural GDP, while the other two variables were not.

Kumar, Singh & Sinha (2010), used secondary Indian data to show that the institutional credit to agriculture, in real terms, increased tremendously during the past four decades, with the structure of credit sources witnessing significant change. Commercial banks emerged the key players or source of institutional credit over the recent years. However, the observed reduced-share of investment credit to the total credit constrained sustainable agricultural growth. The proportion of institutional credit availed by the farming households was significantly affected by such socio-demographic variables as education, farm-size, family-size, caste, gender, occupation of household, etc. The authors recommended the simplification of the existing lending procedure that would provide better access to agricultural credit for smallholders and less-educated/illiterate farmers in India.

The reviews above reveal the dearth of concerted survey-methodologically-based study of Nigerian origin that treated a comprehensive analysis of the impact of traditional, formal, and international-institutional, and governmental sources of funds on agricultural production and development in Nigeria. Existing studies are at best fragmentary; and this provides a further justification for the present study.

METHODOLOGY

Design, Instrument, and Validation.

The study follows the quasi-experimental research design that is suitable for survey studies in management sciences disciplines, since it involves generating primary data based on the candid opinions of the study subjects. The critical research instrument is the structural questionnaire that is distributed for completion by the respondents. The questionnaire was checked for validity and reliability using the Cronbach Alpha statistical tests. The computed Cronbach Alpha statistic for reliability test is 83%, while that of validity test is 87% and these were considered to be appropriate, valid, and reliable for the analysis for this study.

Sample Size and Sampling Procedure

The sample size of 296 was determined using the Kazmir's statistical formula, which was rounded up to 300. Accordingly, 300 sets of questionnaires were distributed among literate farmers in Kogi State using judgmental sampling procedure. The researcher relied on informed judgment and decided to distribute the research instrument to contacted farmers specializing on grains (such as rice, millet, sorghum, corn, and wheat) and tubbers (such as yam). Out of the 300 sets of questionnaires, 286 were retrieved, making a response ratio of 95.33%. Out of the retrieved 286, 6 were not considered good for the analysis due to inappropriate completion. Thus, only 280 sets are good for the purposes of the analysis, and are, thus, used.

Analytical Techniques

Many statistical tools are employed ranging from descriptive statistics such as the simple ranking tables, measures of central tendencies like the mean, and percentages. The statistical techniques of tests for equality of means the T-test, Satterthwaite-Welch t-test, ANOVA F-test and Welch F-test are employed to test relevant hypotheses. This is because the hypotheses involve the test of difference.

PRESENTATION AND ANALYSIS OF DATA

Demographic Information

From the available responses from the questionnaires, 252 respondents or 90% were male farmers, while 28 or 10% were female farmers. 192 or 68.57% of the farmers studied attained has the west African Certificate and above, while the remaining 88 farmers or 31.43% secured the first school leaving certificate. All the farmers were either married or widowed; there were no divorcees. 78 farmers or 21.84% were above the age of 60, while 140 or 50% of the farmers are within the ages of 41 and 59. Only 62 or 22.14% of the farmers were under the age 40. These show the highest number of farmers studied (the mode) fall under the middle-age category. They were mostly experienced in the practice, especially when consideration is given to the fact that the least of their years of farming practice was 8 years, which was among those under 40 years' category. All the farmers studied agreed on using one form of external financing or the other. They have received credit either from the modern financial institutions or the other, most times more than once. They have all accessed funds through the traditional financial agencies. They have all received one form of governmental financial intervention or the other. These make them qualified to give sound impression on the questions asked in the questionnaire.

Farmers Impression on Modern Financial Institutional Funding of Agriculture

The farmers were also asked about their experience with financing by banks and other financial institutions. Many of them has knowledge that these institutions extend credit to agriculture, with many being beneficiaries. This is supported by the revelation that 85% of the distribution or 238 farmers have received one form of bank credit or not, while 15% claimed that they have not (see Table 1). Of this number, they were required to give their objective opinion on the effectiveness of the institutional funding on their agricultural activities. Their responses are summarized on Table 2.

TABLE 1
RECEIPT OF BANK CREDIT BY FARMERS

Response	Frequency	Percentage
Yes, I have received loan	238	85.0
No, I have not received	42	15.0
Total	280	100%

TABLE 2
IMPRESSION OF FARMERS ON EFFECTIVENESS OF BANK CREDIT RECEIVED

Type of Bank	Great Extent	Moderate	Poor/ Little	No Extent	Total*	%	Mean ratio
BOA	78	153	9	O	549/714	76.89	2.3
BOI	25	102	81	30	360/714	50.42	1.51
Commercial	123	96	19	0	580/714	81.23	2.43
Microfinance	34	110	67	27	389/714	54.48	1.63
World Bank	70	148	0	20	506/714	70.86	2.12
IFAD	21	126	51	40	366/714	51.26	1.54
Others	30	123	22	63	358/714	50.14	1.50

**n = 238; max-attainable-frequency =714.*

As seen, the farmers judged the funding from commercial banks 81.23% effective; implying that this source is more readily available, accessible, and greatly contributory their production activities. The calculated mean ratio of 2.41 is higher than the threshold mean rate of 2.0 or 66.67% of the entire distribution. This level of adjudged effectiveness may be directly connected with the involvement of these banks on the agriculture credit guarantee scheme funding. They respondents ranked the Bank of Agriculture next in importance (76.89% or a mean ratio of 2.3) to the commercial banks in effect on agricultural production. The calculated mean of 2.3 is higher that the threshold-mean of 2.0 on a 3-point-maximum-scale or percentage-to-maximum of 66.67%.

World bank financing as a source of agriculture funding is adjudged third on the ladder of effect or effectiveness by the farmers. The level of effectiveness of world banking funding of agriculture is 70.86%, which is higher than the established threshold of 66.67%. Equally, the observed mean of 2.12 is greater than the threshold-mean of 2.0. Evidently, some of these farmers have benefitted from one world-bank-assisted funding or the other; or they have heard from those that received the loans that testified how good the financing proved, in terms of cheaper financial charges, long-time-duration and moratorium policy. Thus, whenever they have access to funds from the world bank, they gladly use the opportunity.

The Bank of Industry, microfinance banks, international fund for agriculture, and other institutions, mainly the finance houses, were nor considered so important by the farmers as veritable sources of financing for them. The respective mean scores and associated percentage-to-maximum on the 3-point scale are 1.51[50.42%], 1.63[54.48%], 1.54[51.26], and 1.50[50.14] respectively for BOI, microfinance banks, IFAD, and finance companies. These are all lower than the threshold mean score of 2.0 or the threshold percentage-to-maximum of 66.67%. Invariably among the modern financial institutions that fund agriculture, the commercial bank, followed by the Bank of Agriculture, and the World bank Group, in that order, constitute the most effective sources of funds for agriculture in Nigeria, at the rational judgment of the farmers studied. Other institutions were not considered effective.

Traditional Financial Institutional Funding of Agriculture

Table 3 shows that the majority of the farmers are aware of the existence of traditional financial institutions and the role they play in assisting to finance their agricultural activities. For them, it is a normal

way of their financial life. They believe that savings is also a natural part of life, seeing that they must keep back a part of the current income in order ensure continued activities in the future time-period. In view of this, they ranked personal savings as the most important source of funds for their farming operations. In their judgement, personal savings claimed about 2.48 mean score, implying that it is considered 82.62% effective as a source of funds. Family funds/village pool of funds constitute the next most important financing institution among the informal sources. This accounted for a mean score of 2.34 or 78.21% effectiveness as a funding source. The assistance from family members is very well acknowledge and appreciated among the farmers studied.

TABLE 3
IMPRESSION OF FARMERS ON EFFECTIVENESS OF INFORMAL CREDIT RECEIVED

Type of Bank	Great Extent	Moder -ate	Poor/ Little	No Extent	Total*	%	Mean ratio
Personal savings	97	161	17	5	694/840	82.62	2.48
Family/village fund pools	73	152	134	73	657/840	78.21	2.34
Local money lenders	23	195	29	33	488/840	58.10	1.74
Isusu/ contributory meetings (Ajo)	36	210	34	0	562/840	66.90	2.01
Local savings agencies (Akawo)	51	148	49	32	498/840	59.29	1.78
Age grade associations	42	125	63	50	439/840	52.26	1.57
Others: social clubs	23	133	51	73	386/840	45.95	1.37

**n = 280; max-attainable-frequency =840.*

The third most important informal source of funds is the Isusu/ contributory meetings (Ajo) institution, which accounted for a mean score of 2.01 or 66.90% effectiveness level. This class of traditional institutions are heavily entrenched into the fabrics of their society, since they believed they can indulge in rotatory contributions to raise substantial fund for operations, where access to modern financing proves difficult of delaying. This need planning ahead of time, though, in order to achieve it. The research expectation was that the local money savings, popularly called 'akawo' and its variants would constitute a very import source of funding for the farmers. Surprisingly, this source claimed only a mean score of 1.78; imply a considered effectiveness of about 59.29%. The diminished popularity or effectiveness is accounted by the growing realization by the farmers that their financial health and ability rests in their own hands and not in the hands of any outsider who may tend to disappoint; so, personal savings is preferred to akawo. More so, the farmers complained the non-reliability of these savings agencies to make funds available to them when required. They were tired of disappointments from these agencies. Further, their growing awareness of the services of commercial banks and their microfinance counterpart, who can grant them further loans to augment their savings with them is another reason.

Local money lenders were ranked 58.10% effective on a mean ratio of 1,74. The traditional lenders are increasingly losing their former lofty position as rural financiers due to the advent of more credits from the modern sources. The complains about their very prohibiting exorbitant rates of interest and harsh treatments in event of temporary default accounted for reduced patronage from the farmers. Age grade associations and social clubs are quickly losing steam as sources of agricultural funding as farmers judged them 52.26% and 45.95% effective, respectively, on mean ratios of 1.57 and 1.37. The negative competitive tendencies among age-grade members in their part of the world has been so frustrating, while the social clubs are fast going out of fashion and relevance. Judging by both the threshold mean ratio of 2.0 and percentage-to maximum scales, the degree of usefulness of the informal sources are determined by the farmers. Accordingly, in the order of importance or effectiveness personal savings is ranked first, followed by

Family/village fund pools, and then, Isusu/ contributory meetings (Ajo) coming third, in that order. The other sources did not reach the threshold level, and such considered less important (see Table 3).

Modern versus traditional sources of agriculture financing

On which of the categories that best serve the financing needs of the farmers responded to the appropriate questions as required. Their responses are summarized on Table 4. The modern or formal sources were ranked high in their adjudged degree of effectiveness by the farmers studied. The mean score of 2.34 on a 3-point scale represent 78.10% level of effectiveness. The level is higher than the threshold level of 2.00 or a percentage to maximum of 66.67%.

TABLE 4
COMPARATIVE EFFECTIVENESS OF AGRICULTURE FINANCING SOURCES

Response	Weight	Frequency	Total weighted Frequency	Percentage Distribution
FORMAL SOURCES	W	F	W x F	%
Great Extent	3	127	381	45.36
Moderate Extent	2	132	264	31.43
Little Extent	1	11	11	1.31
No Extent	0	0	0	0.00
Total/ Mean Score/%		280	656/840	2.34/78.10
INFORMAL SOURCES				
Great Extent	3	105	315	37.5
Moderate Extent	2	108	216	25.71
Little Extent	1	15	15	1.79
No Extent	0	52	0	0.00
Total/ Mean Score/%		280	546/840	1.95/65.00
GOVERNMENT SOURCES				
Great Extent	3	37	111	13.21
Moderate Extent	2	132	264	31.43
Little Extent	1	71	71	8,45
No Extent	0	40	0	0.00
Total/ Mean Score/%			446/840	1.60/53.19
GENERALITY OF FUNDING SOURCES				
Great Extent	3	111	333	39.64
Moderate Extent	2	140	280	33.33
Little Extent	1	21	21	2.50
No Extent	0	8	0	0
Total/ Mean Score/%			634/840	2.26/75.47

**n = 280; max-attainable-frequency =840 of funds*

On the other hand, the informal or traditional sources were scored a mean of 1.95, representing 65% level of effectiveness. On the 2.0 mean or 66.67% threshold, this observed rate is less than the required level to qualify as effective. This can be interpreted as that their effect is marginally below moderate. When all the funding sources are taken as one, the ranking of the farmers reveal that the observed mean ratio of 2.26 depicts about 75.47% level of effectiveness. This indicates that, from the perception of the farmers,

the generality of the funding sources is effective in funding agricultural operations in the country. This can be interpreted as that the available sources of funds 'affect' their agrarian activities positively and significantly, talking in statistical terms.

Farmers' Impression on Government financing of Agriculture

The study went ahead to delineate the special role of the government in agricultural funding in the country. All the farmers confessed knowledge and awareness of governmental efforts in attempting to boost agricultural production. According to them, some of these efforts were in the areas of provisions of subsidized and, at times, free fertilizers, other subsidies covering unsold products, grants, and loans attached to political party loyalties and leanings. On whether these said assistances are adequate for the agricultural production, the farmers believed that the effectiveness of government financing effort was below moderate extent. This is on the evidence of their response summarized on Table 4, that reveal an average performance rate of 53.09% or a mean value of 1.59 on a scale of 3. Thus, they judged performance rate or effect of government financing to be less than moderate performance, 53.09%; noting that moderate rate is 66.67% or 2.0 on a 3-point scale.

Test of Hypotheses

Two hypotheses were proposed earlier in respect of any statistical difference in the perception of farmers regarding the effectiveness of: (a) formal versus informal and (b) modern and traditional financial institutions. Starting from the first hypothesis, the study tests are as follows.

TABLE 5
TEST FOR EQUALITY OF MEANS

Panel A: Test for Equality of Means Between Series: Formal versus Informal sources

Method	df	Value	Probability
t-test	6	-0.059108	0.9548
Satterthwaite-Welch t-test*	5.029309	-0.059108	0.9551
Anova F-test	(1, 6)	0.003494	0.9548
Welch F-test*	(1, 5.02931)	0.003494	0.9551

Panel B Test for Equality of Means Between Series Modern and traditional financial institutional sources

Method	df	Value	Probability
t-test	12	0.171703	0.8665
Satterthwaite-Welch t-test*	11.99855	0.171703	0.8665
Anova F-test	(1, 12)	0.029482	0.8665
Welch F-test*	(1, 11.9986)	0.029482	0.8665

**Test allows for unequal cell variances*

Hypothesis 1: *There is no significant difference between the effectiveness of formal sources and that of informal sources of funds for farmers.*

Test statistics and results: The statistical techniques of tests for equality of means the T-test, Satterthwaite-Welch t-test, ANOVA F-test and Welch F-test are employed. Their results are summarized on panel A of Table 5. From the Panel all the conducted four test statistics reveal values and associated

probabilities of -0.059[0.9548] for the T-test, 0.059[0.9551] for the Satterthwaite-Welch t-test, 0.0035[0.9548] for the ANOVA F-test and 0.0035[0.9551] for the Welch F-test. These have probabilities that are far greater than the alpha probability of 0.05. By implication, the study accepts the null hypothesis that no significant difference exists in the degree or level of effectiveness between the formal and informal sources in financing agriculture in Nigeria.

The study went ahead to fine-tune the first hypothesis and shift the emphasis slightly to distinguish between the effectiveness of modern financial institutions and that of traditional financial institutions; this taking away the effect of governmental funding. Given this, the study hypothesize as follows:

Hypothesis 2: *There is no significant difference between the effectiveness of modern and traditional financial institutions as sources of funds for farmers.*

Test statistics and results: The statistical techniques of tests for equality of means the T-test, Satterthwaite-Welch t-test, ANOVA F-test and Welch F-test are employed. Their results are summarized on panel A of Table 5. From the Panel all the conducted four test statistics reveal values and associated probabilities of 0.172[0.867] for the T-test, 0.172[0.87] for the Satterthwaite-Welch t-test, 0.29[0.87] for the ANOVA F-test and 0.0295[0.867] for the Welch F-test. These have probabilities that are far greater than the alpha probability of 0.05. Thus, the study does not reject the null hypothesis and infers that there is no significant difference between the degree or level of effectiveness of the modern financial institutions and traditional financial institutions as sources for financing agricultural production in Nigeria.

CONCLUDING REMARKS

Major Findings

Among the modern financial institutions that fund agriculture, the commercial bank, followed by the Bank of Agriculture, and the World Bank Group, in that order, constitute the most effective sources of funds for agriculture in Nigeria, at the rational judgment of the farmers studied. Other institutions were not considered effective.

In the order of importance or effectiveness in agricultural funding, among the informal sources of funds, personal savings is ranked first, followed by family/village fund pools, and then, Isusu/ contributory meetings (Ajo) coming third, in that order. The other sources did not reach the threshold level, and such considered less important or effective.

The modern or formal sources were ranked high in their adjudged degree of effectiveness by the farmers studied (78.10% level of effectiveness). On the other hand, the informal or traditional sources (with 65% level of effectiveness) were scored below the threshold level of 66.67%, and thus their effect is marginally below moderate. Government financing reveal an average performance rate or effect of 53.09% against the threshold level of 66.67%. Thus, the farmers judged the effectiveness of government financing to be less than moderate performance.

From the perception of the farmers, the generality of the funding sources (put together) is effective in funding agricultural operations in the country. This can be interpreted as that the available sources of funds 'affect' their agrarian activities positively and significantly, talking in statistical terms. No significant difference exists in the degree or level of effectiveness between the formal and informal sources in financing agriculture in Nigeria. There is no significant difference between the degree or level of effectiveness of the modern financial institutions and traditional financial institutions as sources for financing agricultural production in Nigeria.

RECOMMENDATIONS

The following recommendations become incidental to the analysis in this study:

1. Since the commercial banks, followed by the Bank of Agriculture, and the World bank Group, in that order, constitute the most effective sources of funds for agriculture in Nigeria, the

government should ensure policies that would encourage these institutions to continue their good work.

2. That the level of effectiveness of government financing is seen to be of less than moderate performance, indicates the need for the government to re-examine their allocational and spending priorities, and check if there are instances of misappropriation or unplanned diversion of necessary funds. If such incidents are discovered, appropriate adjustments and policy re-directions should be implemented.

CONCLUSION

The study discloses that both formal and informal sources of funds jointly contribute, and that significantly, to agricultural production growth and development in Nigeria. Actually, from the perception of the farmers, the generality of the funding sources (put together) is effective in funding agricultural operations in the country; thus, the available sources of funds 'affect' agrarian activities positively and significantly. Among the informal sources of funds, personal savings, followed by family/village fund pools, and then, Isusu/ contributory meetings (Ajo), in that order, constitute the most important sources of funds for agriculture. From the staple of formal sources, commercial banks, followed by the Bank of Agriculture, and the World Bank Group, in that order, constitute the most effective sources of funds for agriculture in Nigeria. Government financing of agriculture is not seen as optimal to further the development of agriculture in Nigeria.

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