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The Effectiveness of Funding Sources on Agricultural Projects in Yobe State, Nigeria

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Abstract

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MSc, Bayero University, Kano, 1996

BSc, University of Maiduguri, 1992

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

This study examined the effectiveness of the Fadama III, National Program for Food Security and International Fund for Agricultural Development programs in reducing poverty and income inequality in Yobe State, Nigeria. Agricultural funding in the state has increased by 670.7% between 2004 and 2013. Despite this trajectory, the state ranks among the worst in Nigeria in terms of poverty and income inequality according to UNDP report, reinforcing the need to investigate the impact of agricultural funding on the state's welfare. Previous studies in this area have been on a country-wide basis and have not disaggregated the funding sources. This study disaggregating the funding sources of Yobe State in order to establish the effectiveness of each funding source. Field survey data from the fund beneficiaries and secondary data from the Central Bank of Nigeria, National Bureau of Statistics, and the World Bank provided empirical evidence. The first-best resource allocation theoretical framework was applied to understand the impact of funding sources on the welfare effect of the beneficiaries. The Ordinary Least Square, analysis of variance, and *t* test revealed that agricultural funding significantly and positively impacts on recipients' standard of living, asset base, and agricultural output, without any significant impact on income. Results indicate that FADAMA III is the most effective in improving the overall welfare of beneficiaries. It is recommended that other funding programs should adopt the models of FADAMA III, and should also require counterpart funding in order to maximize the benefit for a larger segment of the population. These findings may bring positive social change by reducing poverty, expanding economic opportunities, and improving quality of life, leading ultimately to sustainable peace and economic prosperity in Yobe State.

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Dedication

This dissertation is dedicated to my late Parents to whom I owe a great deal for the moral direction and care given to us while they were alive. To my Children, Maimuna, Aisha, Nafisa, Maryam, Muhammad Amir, and Abubakar, and my wives. I wish all of you the opportunity to seek the path of knowledge.

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Chapter 1: Introduction to the Study

The study was conducted to measure and compare the effectiveness of different types of agricultural funding programs in Yobe State, Northeastern Nigeria. Various agricultural funding programs have impacted on Yobe state, which is one of the 36 states in Nigeria. Different projects owned by development agencies or implemented with government counterpart funding are performed by different agencies across the state. Although such intervention projects are not independent of Yobe state, the versions of the projects implemented in the region are designed to address endemic poverty and inequality problems in the communities. Evidence of poverty and other relevant human development indices for Yobe State is presented later in this introduction.

Agriculture financing is an important instrument of farming policy. In parts of the developing world where the population is rural and poor, agriculture policy forms the core of economic and social development plan. Guariso, Squicciarini, and Swinnen (2014) noted that overtime, funding institutions had paid insufficient attention to the plight of poor farmers, especially in developing countries. However, they observed that the plight of urban consumers due to the increase in food prices has drawn global policy attention and hence donor intervention toward alleviating the plight of poor farmers.

Agriculture is a critical factor in addressing the plight of poor people around the world. Citing Food and Agriculture Organization of the United Nations (FAO) and United Nations Development Programmes (UNDP) data, Guariso, Squicciarini and Swinnen (2014) explained that 70% of persons living in extreme poverty depend on agriculture for their livelihood. This number comprises 50% small-scale farmers and 20%

who are agriculture wage earners. Concerning actual intervention projects and their poverty reduction outcome, the authors noted that over the last 10 years up to 2014, the population of people living in extreme poverty reduced by more than 100 million. Correlating with an increase in global development aid funding from 3.7% to 5.5% of total development aid, and a corresponding growth of the financing for the United Nations (UN) system to agriculture from 15.2% to 22.2%. Melamed, Hartwig and Grant (2011) showed that growth in the agricultural sector has a high potential for poverty reduction due to its employment effect. Mason et al. (2011) observed significant output gains due to increased funding support for agriculture but noted that high yields must be complemented by improvements in the agriculture value chain to achieve significant gains in poverty reduction. Raven (2014) argued that, at the very least, output increases are valid indicators of the capacity of agriculture intervention funding to alleviate poverty in developing countries.

An evaluation of the current levels of poverty and inequality in Yobe State raises a fundamental research question about the effectiveness of current intervention programs in the State. Yobe State is a mostly agrarian community in northeast Nigeria and lags behind other states, as poverty level in the state remains the highest in the country. The state also has the lowest human development indicators (Alkire & Seth, 2015; UNDP, 2009). Funding for Agriculture in Yobe State increased by eight-fold from NGN480 million in 2004 to NGN3.7 billion in 2013 (State Partnership for Accountability, Responsiveness and Capability [SPARC], 2014). However, the poverty level in the state remains high at 90.2% in 2013 (Alkire & Robles, 2015). The relationship between the

rate of poverty and intervention programs, therefore, needs to be investigated to determine the effectiveness of current programs.

The relative ineffectiveness of agriculture intervention programs in Yobe State does not necessarily suggest that current funding agency interventions do not reduce poverty and inequality in developing countries. Intervention programs by development agencies are necessary to fill a critical financing gap in developing countries not only because of the actual funds or resources, which the organizations provide (Pingali 2012; Ray et al., 2013). Pingali (2012) argued that private investors have insufficient incentive to invest in public goods that have seen productivity in the main staple crops triple over the past five decades. Similarly, individual countries are unwilling to commit funds to research that would be shared by other nations. This would not give sufficient competitive advantage over other countries. Even increasing the volume of funding by governments would not significantly improve impact concerning poverty reduction (Dia et al., 2013). According to Pingali, interventions by international public goods institutions therefore remain the most realistic route to achieving the same level of success in developing countries.

The solutions to high rates of poverty in rural, agrarian populations may lie in reviewing policies and methods of intervention funding. Dia et al. (2013) argued that the nature of intervention system is important not only in making agriculture funding more efficient but also to create the right incentive for private investment, especially in sub-Saharan Africa. Dar et al. (2013) suggested that food production interventions targeted at poor and disadvantaged communities should consider both the economic conditions that

create poor communities as well as the poor environmental conditions that characterize their habitats. These conditions should be factored into the policy, type of intervention, and even the choice of technology to be adopted in agriculture production. George (2014) observed that policies, which do not factor into funding models, such as risks and returns market settings for beneficiaries, have the potential for improving productivity without enhancing income. Pingali (2012) noted that intervention models that encourage sustainability practices for funding organizations and beneficiaries have a high potential for lowering the poverty level over time. These findings and observations have significant implications for the design of policy and method of intervention.

The need to study the effectiveness of intervention programs created to improve performance is also significant in view of the link that has been established between poverty in Yobe State and surrounding communities in the northeast and the high level of conflict and insecurity in the region. A large body of literature links to conflict and instability in northeastern Nigeria to the rate of poverty, which is, in turn, inimical to socioeconomic development (Ali, 2013; Ewetan & Urhie, 2014; Ezeoba, 2011). According to Ewetan and Urhie (2014), the internal causes of insecurity in Nigeria pose the greatest challenge to socioeconomic development. These internal causes of instability are due to socioeconomic deprivations arising from systemic and political corruption; conflict over allocation and distribution of resources; pervasive material inequalities and perceived injustice.

The current insurgency in the northeast provides the most significant evidence yet of the link between the incidence of poverty in the region and conflict. Ewetan and Urhie

(2014) correlated the level of economic development in Nigeria with the current level of conflict in the country, particularly as manifested by the Boko Haram crisis. They presented data on Nigeria's Human Development Index, an indicator of socioeconomic development, which shows the small level of social and economic development. Ewetan and Urhie concluded that a low level of social and economic development, confirming an inverse relationship between vulnerability and socioeconomic development, accompanies a high standard of insecurity.

With regard to human development indicators, Ali (2013) linked the state of insecurity in northeast Nigeria to low socioeconomic indicators, which include life expectancy, death rate, and access to water, the incidence of poverty, mortality rate, and crime rate. Ali theorized a possible unknown cause of the Boko Haram conflict was the incidence of poverty. This explanation is related closely to relative deprivation, rather than absolute poverty. As a result, the inability of the state to provide essential services for the populace generates new conflict or renews old ones. With the extreme rates of persisting poverty in the northeast, many young people are easy targets for radicalization as they are disillusioned with the government to provide essential resources, employment, and security to the north (Onuoha, 2012). Some of these indicators constitute the basis to measure the outcomes of intervention programs in Yobe state. Evaluation of the effectiveness of intervention programs in the not east therefore has the potential for creating the conditions for reduced conflict and insecurity in the northeast.

The efficiency of the agriculture intervention programs is best measured based on the specific objectives for which the plans are designed. The findings may reveal

underlying sources of efficiencies or inefficiencies associated with the intervention projects. The findings may then lead to recommendations for more efficient funding models or a review of program objectives to ensure optimal outcomes for beneficiary communities. The resulting social change may be measured in the reduction of both income and food poverty among recipients and also create conditions that could reduce the incidence of conflict and insecurity in northeast Nigeria.

In my study, I used quantitative methods to measure the effectiveness of the various intervention programs in Yobe State from different funding sources. The objective is to establish the most efficient way of utilizing agriculture intervention funds in Yobe State. I believe that a more period financing of agricultural activities would be vital for achieving poverty reduction, economic growth, and development, and ultimately address the pervasive physical and economic insecurity in the region.

In the next section, I briefly summarized the relevant academic materials that I reviewed in Chapter 2. In the section following the summary of the literature, I outlined the currency and relevance of the theoretical and methodological gaps that I have identified for this study. I then proceeded to state the research questions, and research hypothesis arising from the problem. I explained the theoretical framework, which serves as a guide for my research design. I then followed up with the statement of the problem with a description of the nature of the study, the assumptions, and the scope and limitations of the study. The chapter ends with the identification of possible significance of the research to theory, practice and social change.

Background to the Study

Poverty remains a major problem for rural agrarian populations. Rapid urbanization has raised the living standards in some parts of the developing world. However, poverty and inequality remain a fundamental characteristic of rural communities (Akram-Lodhi & Kay, 2012). Akram-Lodhi and Kay (2012) argued that the resolution of the agrarian question was key to resolving the poverty situation in poor, rural communities. The agrarian question pertains to whether an investment in agricultural development should dictate market forces, which allows capital to flow only in the direction of higher returns per capital investment. Hazel (2013) did not completely discount the role of market forces in developing different aspects of agriculture in developing countries. Hazel argued, however, that the "challenge for African policymakers is to find the right balance between a food security and a business agenda" (p.13). Agricultural development in the continent entails both production and marketing components.

Whether agriculture intervention programs should focus on reducing poverty and inequality or toward increasing efficiency and profitability remains contentious. Okun (2015) stated that the considerations of equity and effectiveness, while in conflict with each other, both sides have similarities. One is needed to balance out the other. In practical terms, intervention programs that incorporate elements of the two considerations may have the biggest net positive social change impact.

Most agriculture intervention programs have entailed the disbursement of grants to needy beneficiaries, but certain types of market-based approaches have shown positive

outcomes for rural populations. Ike and Uzokwe (2012) demonstrated that return to labor in microcredit assisted agricultural programs could be higher than interest on agricultural loans to rural farmers. Ojiako and Ogbukwa (2012) found that in some other communities, the problem was not returns to labor or other factors of production but the repayment of credit. However, Olomola et al. (2014) argued that the problem of agriculture spending in Nigeria is allocative efficiency rather than technical efficiency. The authors discussed the lopsided manner of budgetary allocation to three tiers of government, namely the federal, states, and local governments have shown a poor level of prioritization. Ojo and Adebajo (2012) suggested that a government food policy rather than an agriculture policy is more likely to yield greater impact on rural communities. This argument, however, tends to suggest that the problem of poverty in rural communities in Nigeria is first that of food poverty and less that of income poverty.

The implication of the distinction between dimensions of intervention also raises a question about aspects of poverty. Alam et al. (2011) found that policy intervention in agricultural produces a positive net gain in social welfare. However, Alkire and Seth (2015) pointed out that poverty is multidimensional, and that reduction in one dimension of poverty (e.g. income poverty) due to policy intervention does not necessarily lead to a decrease in other dimensions of poverty (e.g. social amenities).

Agricultural financing in Nigeria is an essential element of policymaking for governments at the national and subnational levels. Over time, agricultural productivity has been responsive to financial investment, particularly in the area of agricultural research and development (Maredia & Raitzer, 2012). Significant changes have been

made in the developed world over the course of 20 years that reduces government's involvement in the direct financing of agricultural research and development.

In the case of agriculture credit intervention schemes, there is a reasonable consensus in the available literature that local farmers or beneficiaries' association enhances the probability of project success. Ayoade, Ogunwale, and Adewale (2011) covered a range of projects carried out at different periods. Projects with a high standard of community participation in project planning and execution record similar results. The results were consistent across different intervention programs across various parts of Nigeria

Development projects are directed specifically at reducing poverty, creating employment and social equity. Knutsson (2009) outlined a history of current intervention policy and concluded that intervention strategy focused initially on macroeconomic growth but subsequently evolved to as social development policy in the 1970s. However, Sen (2013) argued that even traditional models of intervention have failed to produce the notion of shared prosperity. Within populations that benefited from intervention programs, poverty, and deprivation remained high among disadvantaged populations.

There are both theoretical and practical links between agriculture intervention programs on household income and asset acquisition. Umar and Abba (2012) showed that projects with significant community participation at the design stage have a net positive impact on output, income, credit access, asset acquisition, and extension services. These findings are consistent with the ownership principle of social development projects carried out by donor agencies in developing countries.

Several other researchers have not made a definite connection between asset, income, and other related criteria. Ango et al. (2012) and Ike and Nzokwe (2012) did not find a positive or negative connection between program funds and income or asset. The researchers found that across populations in the different beneficiary communities, the utilization of the funds yield different (positive and negative) results for various agricultural projects.

The successes of agriculture intervention programs are sometimes determined by the conflicting objectives of global agribusiness policy and development policy. Mustapha (2011) argued that the current World Bank funding system devotes to raising the production standards of local farmers is tilting towards the selective development of commercial agriculture compared to the past programs. Akram-Lodhi and Kay (2012) argued that global agribusiness objectives are increasingly influencing the World Bank's emerging trend of the new policy goal. The sources of deviation from set targets might well lie in the divergence between local and foreign goals.

The link between savings and investment is demonstrated in small-scale projects to raise the income of rural farmers. Dillon (2011) conducted a poverty impact study for small irrigation projects in Mali and found that the projects have the capacity to increase consumption and savings while reducing risks faced by farmers engaged in tropical livestock farming. The consideration of saving and investment parameters apart from measuring program effectiveness is considered useful for determining project sustainability.

Classification of funding sources into private and public sector makes for favorable comparison using traditional market logic arguments. Butler and Cornaggia (2011) and Liebenberg, Pardey, and Kahn (2011) compared funding models where government sources predominate with alternative private sector-dominated sources of financing. Although the categories expand on further subdivisions of each source into their microsets such as national and subnational governments, local and international agencies, financial and nonfinancial development institutions. Obansa and Maduekwe (2013) complemented the model by disaggregating the sources into municipal (government) budgetary allocations, grants by foreign governments, and agencies and credit financing. The distinction is useful in identifying the categories of funding on which comparative assessment of relative effectiveness can be carried out.

The theoretical framework of the study is base on the first-best resource allocation theory of the welfare economics. Dasgupta, Goulder, Mumford, and Oleson (2012) used the first-best resource allocation theory of the welfare economics to consider first, the problem of measuring welfare change along the first-best optimal. Hamilton (2012) argued that the proponents of the theory rely on the concept of substantial saving by claiming that actual saving is an indicator of total net investment in the sense of summarizing the value of all capital structure undertaken by the community over a period. In adapting this theory to their study, Arrow, Dasgupta, Goulder, Mumford, and Olleson (2012) argued that genuine saving constitutes an actual measure of welfare changes in asset-base, agricultural output, income per capita, and household income over time interval if the resource allocation is first best.

Agricultural spending in developing countries dominates budgetary allocations by the government with the remaining portion of funding supplemented by loans and grants from donor agencies and development finance institutions (Mogues & Benin, 2012; Stein, 2011; Umar & Abba, 2012). While empirical studies have shown that funding policies of governments have a significant impact on agricultural productivity, it might be difficult to conclude on the strength of these investigations alone, that increasing government investment in agriculture could lead to better performance of agricultural projects and programs.

Current comparative approaches aimed at improving the qualities of findings are however too broad to make useful conclusions about the strength of individual funding models. Butler and Cornaggia (2011) and Liebenberg et al. (2011) have attempted comparing funding models where government sources predominate with alternative private sector-dominated sources of financing. A robust measure would disentangle the source into the micro sets to ascertain the characteristics of the micro-sets and their effectiveness to agricultural funding.

One logical approach to efficient the effectiveness of funding flowing to the agricultural sector is to compare the performance of funds from the various components or sources rather than the traditional approach adopted by past scholars that use broad classification. Obansa and Maduekwe (2013) classified the primary sources of funding agricultural projects in Nigeria specifically into national (government) budgetary allocations, grants by foreign governments and agencies and credit financing. This

classification is useful in identifying the categories of funding on which comparative assessment of relative effectiveness can be carried out.

Other studies adopt general classification model. For instance, Dellmuth and Stoffel (2012) investigated the effectiveness of agricultural funding by the two tiers of government (federal and subnational government). His findings revealed that certain categories of agricultural projects funded and monitored by subnational government performed better than federal government projects in Nigeria. Sufficient attempt was not made to categorize projects performance regarding types of funding sources. For instance, some funds classified as public funds might be counterpart fund with foreign donor agencies. Such distinctions have become imperative since the conditionalties attached to such sources. The present study fills this gap and identifies the most efficient ways of utilizing agriculture intervention funds for maximum impact on beneficiary communities concerning reducing levels of poverty and income inequality.

Problem Statement

The research problem is to examine the effectiveness or ineffectiveness of various agricultural funding sources used as a tool for poverty reduction and income inequality in Yobe State, Nigeria. In spite of an eight-fold increase in agricultural funding from NGN480 million in 2004 to NGN3.7 billion in 2013 (State Partnership for Accountability, Responsiveness and Capability [SPARC], 2014) poverty level in the state remains high at 90.2% in 2013 (Alkire & Robles, 2015). Several studies with mixed results have estimated the impact of funding sources on poverty reduction of the beneficiary communities (Collier & Dercon, 2014; Jarboui, Forget, & Boujelbene, 2014;

Kanbur, & Sumner, 2012; Lloyd-Jones & Rakodi, 2014; Ojiako & Ogbukwa, 2012). However, relying on the results of these studies for policy formulation might be misleading because the studies failed to decompose the funding sources, to at least establish the influence of the characteristics of the sources in ensuring the success of the fund. Yobe state considers appropriate since agriculture is the mainstay of the people.

The past studies on the effectiveness of agricultural funding programs in Nigeria focuses mainly on project scale and agricultural output rather than sources of financing (Asaju, Adagba, & Kajang, 2014; Ozumba, 2014; Whitfield, 2012). No current studies on the relationship between the sources of agricultural funds and their impact on income and poverty reduction at the state level in Nigeria exist. Even the studies involving multiyear assessment are stand-alone case studies (Masset, Haddad, Cornelius, & Isaza-Castro, 2012). The study of the relationship between the sources of agricultural funds and their impact on development indicators such as poverty alleviation, income inequality, and asset acquisition at a state level is the first similar one in Nigeria. This study fills this gap and identifies the most efficient ways of utilizing agriculture intervention funds for optimal positive impact on beneficiary communities regarding poverty reduction and income inequality.

Purpose of Study

The purpose of this quantitative ex post facto study is to explore the application of the first best resource allocation theory as a framework for enhancing the understanding of the impact of the various sources of agricultural funds on community development. For the purpose of the study, community development is measured concerning income

levels, poverty alleviation, assets acquisition, and agricultural outputs. To establish the net effect of agricultural funding in beneficiary communities, I introduced control variables as inflation rate, government expenditure, and the level of technology, climate change, exchange rate, and corruption that could also influence community development indicators. The participants are the beneficiaries of the agricultural funds in Yobe state, Nigeria.

For this study, the independent variables are the agricultural funding from various sources. The sources are the Fadama III, NPFS, and Community-Based Agricultural, and Rural Development Program (CBARDP)/IFAD. The dependent variables are the assets acquisition proxied by changes in the net worth of the beneficiaries; income level is proxied by the nondiscounted cash flow of the recipients, poverty level by income per capita, and productivity by total agricultural output. The control variables include (a) inflation rate proxied by changes in consumer price index, (b) climate change which is a dummy that takes the value of 1 if the weather is favorable and 0 if the weather is unfavorable, (c) government expenditure which is proxied by total Yobe state government spending on agriculture, and (d) level of technology which is a dummy variable that takes the value of 1 if the beneficiaries use modern farming equipment and zero if they use ancient equipment. Others are exchange rate is the naira value per unit of foreign currency in the form of a grant. It takes the value of 1 if the exchange rate is favorable and the value of zero if the exchange rate is unfavorable. The level of corruption is defined by the existence of monopoly and discretion without accountability.

Research Questions

Research Question 1: What is the impact of the different agricultural funding sources on poverty reduction and income inequality in Yobe Sate?

Research Question 2: To what extent does governance system influence the effectiveness of agricultural funding?

Research Question 3: What other consideration affects the success or failure of different sources of agricultural funds in Yobe state?

Research Hypotheses

The objectives of the study are aligned to the following a priori assumption.

$H_0$1: There is no significant positive relationship between standard of living and agricultural funding.

$H_1$1: There is a substantial positive relationship between the standard living and agricultural funding.

$H_0$2: Agricultural financing does not have significant positive impact on the asset-based of farmers in Yobe State

$H_1$2: Agricultural investment has significant positive effects on the asset-based of farmers in Yobe State

$H_0$3: Agricultural funding sources do not have significant positive impacts on the income of beneficiaries.

$H_1$3: Agricultural funding sources have significant positive impact on the income of beneficiaries.

$H_0$4: Agricultural finance sources do not have significant positive impact on agricultural output.

$H_1$4: Agricultural finance sources have significant positive impact on agricultural output.

Theoretical Framework

The theoretical framework of the study is based on the work of Arrow et al. (2012) using the first-best resource allocation theory of the welfare economics. The theorists consider first, the problem of measuring welfare change along the first-best optimal. The proponents of the theory rely on the concept of genuine saving which has gained much attention in the literature on welfare measurement in dynamic economies. Aronsson and Johansson-Stenman (2014) argued that actual saving is an indicator of the entire net savings in the sense of a brief the value of all capital formation undertaken by society over a period. In adapting this theory to their study, Arrow et al. (2012) argued that genuine saving constitutes an exact measure of welfare changes in asset-base, agricultural output, income per capita and household income over a time interval if the resource allocation is first best.

This research work is consistent with the existing literature that defines genuine savings as an indicator of sustainable development. The World Commission describes development to be sustainable if it meets the need of the present without undermining the ability of future generations in meeting their needs and requires welfare to be nondeclining (Arrow et al., 2012). Brume, Gine, Goldberg, and Yong (2015) argued that the a priori expectation is that agricultural financing from the different funding sources

increases genuine savings proxied with asset-base, agricultural output, income per capita, and household income.

Nature of Study

In this study, I adopted the ex post facto research design with the quantitative focus, utilizing data from secondary sources. The decision to choose the ex post facto research design is based on the fact that I relied extensively on historical data that already existed. Ex post facto research design involves events that have already taken place because time-series data of maximizes the information included in the analysis. Quantitative measurement was carried out to determine the relationship between the flow of funds to the agricultural sector from three primary sources such as statutory government allocations, foreign development assistance and loans and advances to the sector.

The variables include household income, income per capita, agricultural funding, asset acquisition, and agricultural output. Agricultural production, income per capita, asset acquisition, and household income are treated separately in the models as dependent variables, and agricultural funding is use as the independent variable. Other variables introduced that might impact the dependent variables were government expenditure, the level of inflation, climate change, the level of technology, and other control variables.

The data for the study are the beneficiaries of the Fadama III, NPFS, and the CBARDP/IFAD using a questionnaire. The macroeconomic data that entered the model, as controlled variables are sourced from Central Bank of Nigeria Statistical Bulletin and

various National Bureau of Statistics reports. I used the Eviews statistical package to estimate the OLS multiple regression equations and the necessary diagnostic tests.

Definitions

The variables used in the study are defined as follows.

In the regression model: Yi = B0 + B1X1i + B2X2i + Ui

Subscript i: Observation I = 1… n;

Yi: Dependent variable or the regress

X1i + X2i: Independent variables or the regressors

B0 + B1X + B2X: Population regression lines or population regression functions

B0: The intercept of the regression line

B1+ B2: Slope of the population regression line

Ui: Error term.

STDL: Standard of Living Poverty Level

AGRF: Agricultural Funding Sources

AB: Asset-Base

AGO: Agricultural Output

CC: Climate Change

GOVEXP: Government Expenditure

TECH: Level of Technology

EXCHRT: Exchange rate

Corrupt: Corruption

The following terms are defined according to their intended meanings as used in the text of this dissertation:

Beneficiary Farmers Refer to recipients of agriculture intervention programs, which engage in farming as a primary source of livelihood. The term does not apply to individuals who set up farms in the study area strictly as a business, commercial enterprise or even a pastime.

Competitive Grant Fund: Funding for agriculture research based on results produced by previous research activity.

Formula funding*:* Is a type of funding where government allocates funds according to the output of previous research activity.

Geopolitical Zone*:* The federal constitution divides Nigeria into six geographic regions for the purpose of equitable allocation of resources. The term, in the context of this dissertation, has no political connotation. Yobe State belongs to the northeast zone along with five other states.

Sustainable development*:* Development, which meets the need of the present without compromising the ability of future generations in meeting their needs and requires welfare to be nondeclining (World Commission on Sustainable Development, 1989).

Assumptions

The primary hypothesis of the research work is that there is efficiency variations associated with different sources of funding projects as postulated by (Emrouznejad & Cabanda, 2014). I assume that the effectiveness differences are dependent on changes in

the conditions imposed by fund providers on the use of such funds. Funds' beneficiaries are sensitive to the level of liability associated with different financing sources, which in turn determines the quality of decisions.

These conditions provide the rational incentive for beneficiaries to either apply the funds efficiently or misuse the funds by either diverting funds to uses for which not originally intended or in ways that do not allow for optimal results. I assume that because beneficiaries expect that intervention grants are unsecured and repetitive, there is little incentive to apply considerations of profitability by recipients.

Conversely, funds that are perceived by recipients as contingent on performance or repayable would result in a positive incentive to use funds more efficiently this would lead to optimal results or overall effectiveness of agriculture intervention resources. These assumptions are useful for understanding how local attitudes might help in explaining why certain intervention programs produce results that vary broadly across specific populations. The notion of project performance variation based on beneficiary incentive also contributes to analyzing performance changes in the context of conditions that are controllable by institutions, which provided intervention funds for the purpose of poverty reduction and raising incomes of beneficiary communities.

Scope of the Study

I investigated the extent to which sources of funding for agricultural projects affect the success of projects in parts of the developing world. Nine communities were selected for the purpose of this research work. I selected three villages from each of the senatorial zones in Yobe State Nigeria. Three key agriculture projects reflecting credit

financing, government financing, and international development financing served as the source of my data. The projects selected are Fadama III, NPFS, and CBARDP/IFAD. I sourced information from two primary sources that represented project beneficiaries and the organizations' that carried out the programs. These two sources were the Islamic Development Bank (IDB), the Department for International Development (DFID), and the World Bank and the Federal Government of Nigeria. I considered the non-beneficiaries of the programs living in the selected communities as the control in this research work. A measurement was carried out at both the implementing organization and beneficiaries' levels. I adopted the Cost Performance Index (CPI) and Time Performance Index (TPI) for measuring performance at the organizational level. I also measured project outcome and impact on beneficiaries' communities using three quantitative parameters: income, output (yield), and asset acquisition. I covered a 5-year period from 2010-2014 inclusive.

Limitations

Given the ex post facto design adopted for the study, it would have been most appropriate to conduct the study across the entire population of the beneficiaries in Yobe State. The approach would have been ideal to carry out an exhaustive assessment of the impact of the various agricultural funding programs on income and poverty at the household level. This methodology is typical of most household surveys in the northeast and Nigeria. However, conducting the study across the entire beneficiary communities might not be feasible given that it would require enormous capital outlay and a significant amount of time and resources. Thus, financial resources and time impose severe

constraints to this study. In addition to this limitation, the issue of insurgency currently going on in Yobe State and across the entire northeast region has made it practically impossible to assess some communities. These problems are compounded by the fact that some beneficiary communities are currently in Internally Displaced People's homes (IDPs) because of the activities of insurgents in those communities. The level of education of the participants imposes the problem of data integrity. I addressed circumvent this limitation by using the interview in addition to the questionnaire.

Notwithstanding this limitation, the identification and selection of participants for the study was done using selection criteria that are as representative of the communities in Yobe State as possible. Also, the number of beneficiary communities, as well as individual beneficiaries within the communities selected, was sufficiently large enough to enhance the validity of the findings and the quality of the conclusions drawn the spread. Thus what the study lacks in the spread was also sufficiently compensated for in depth.

Significance of the Study

The importance of this study is explained regarding theory, practice and contribution to social change.

Significance to Theory

The findings of this study help to advance a theory of optimization for agriculture financing in agrarian communities such as Yobe State in northeastern Nigeria. The study is on the relevant theoretical framework, which establishes a general relationship between genuine savings and sustainable development. The theory is adapted to this study using the concept of net capital formation over time advanced by Hamilton (2012) measured

concerning changes in output, assets, and income. In adapting this theory to this study, I intend to test how the relationship between resource allocation and sustainable welfare change in the context of agriculture intervention funding. A change in the well-being of beneficiary communities over time from the different sources of agriculture financing would indicate that sustainable development could be achieved using any one or a combination of sources in funding agriculture.

Significance to Practice

Intervention funding in the agricultural sector in Nigeria is carried out by different local, state, federal and international financing institutions. Typically, these organizations design different governance structures for executing the intervention programs. Selection of Agriculture intervention programs for this study was carried out to reflect the array of different funding models found within the agriculture-financing sector. I expect that the programs selected would show varying levels of project performance based on the type of project, funding model, program incentives, local realities and the organizational characteristic of the financing, institution.

The findings of the study enhance the understanding of how agricultural funding can be better administered to promote the welfare of beneficiary communities in Yobe State. While most single project performance evaluation and multiple projects impacts studies cited in the literature hardly provide conclusive proof of the effectiveness of development funds across the board, in adopting a source-of-funding methodology in this study, the findings may be applied to the management of agriculture development funding in a developing country like Nigeria. Results of the survey have significant

policy implication for those who design and implement agriculture development programs.

I expect that the study would lead to improvement in the instruments used by funding organizations to conduct monitoring and evaluation activity. This study revealed beneficiary-dependent factors which were not observable at the time of conception of each intervention program or which were different from pre-defined evaluation criteria adopted by funding institutions. Similarly, this study will also aid future studies concerning methodology and appropriate performance indicators selected for future studies on effectiveness.

Significance to Social Change

Agriculture is the dominant occupation of the people of Yobe State. Background information on the study area also reveals that the Northeast has the highest poverty and inequality rating and the lowest human development indicators in Nigeria. Current events in the northeast also show a high level of insecurity and an ongoing violent insurgency, particularly in Yobe State. The notion of targeted intervention in the context of the agriculture in the northeast deals primarily with reducing inequality and increasing the standard of living of the communities. Agricultural sector consideration is also significant since it is an integral to the global policy for reducing poverty and income inequality especially in developing countries (Kanbur & Sumner, 2012). Findings from the study could help in reducing the level of poverty and inequality in Yobe State, Northeast Nigeria by identifying more efficient funding models for intervention programs and funding conditionalties that are not inimical to community development. Ultimately,

poverty reduction could mitigate the sources of conflict and increasing insurgency in Yobe State.

Summary and Transition

The objective is to measure the effectiveness of various funding sources on agricultural projects' successes and end results in Nigeria. The researcher focused primarily on agricultural projects designed to reduce poverty and inequality among poor, agrarian populations. I evaluated the performances of three broad categories of agricultural funding projects based on the different sources of funding identified for the study. I also compared the various performance indices to determine whether there are variations in returns accounted for by changes in the category of funding source.

The theorists consider first, the problem of measuring welfare change along the first-best optimal. The proponents of the theory rely on the concept of genuine saving which has gained much attention in the literature on welfare measurement in dynamic economies. I explored the validity of these postulations, by measuring the productivity of funds allocated to each agriculture development project. I used an ex post facto research design quantitative focus to measure the performance of agricultural funding programs, which operate mainly as resource transfers to beneficiaries, against the performance of projects which serve as revolving loans, microcredit or agriculture credit guarantee schemes.

Chapter 2 is a review of academic publications, initially focusing on discussions that broadly consider the level and productivity of agricultural funds and funding projects around the world. Materials studied previously attempts to examine the performance of

various agricultural funding projects, executed in Nigeria over the years. Chapter 3 of this dissertation explains the methodology of the study. In the same chapter, I did the measurement of parameters concerning data type and the source. In this study, I discussed the analytical tools used in the discussions of the data analysis. It also includes the descriptive statistic used to measure the efficiency of funds as achieved by both funds providers and funds beneficiaries. Chapter 4, on the other, is the analysis of the result of the data mentioned in Chapter 3 while Chapter 5 is the summary, conclusion, and recommendation of the entire dissertation.

Chapter 2: Literature Review

The research problem is to examine the effectiveness or ineffectiveness of various agricultural funding sources used as a tool for poverty reduction and income inequality in Yobe State, Nigeria. The purpose is to explore the application of the first best resource allocation theory as a framework for enhancing the understanding of the impact of the various sources of agricultural funds on community development, to establish the net effect of agricultural funding in beneficiary communities. The review of literature for this dissertation traces the origins of social development intervention aimed primarily at reducing poverty and inequality in developing nations. The exercise proceeds through the conceptual underpinnings of social development intervention to current interventions in agriculture activities particularly among poor populations in rural Nigeria. This strategy of investigation is designed to explore the possible ways in which the approach to social development may be affecting the performance of agricultural projects in rural Nigeria.

In-between the history and current implementation of agricultural development projects in Nigeria, the literature review is an exploration of a general theory of project performance based on the type of organizations providing funding for agricultural projects. The research work, which is by first reviewing the submissions of previous studies, which attempt to link agricultural project performance to the kind of program or of implementing agency. Subsequently, analysis of results of studies on the performance of different agricultural projects across Nigeria is undertaken to explore the postulations of project performance based on funding source, through a process of induction. The

review of the literature concludes with few thoughts on possible ways in which agriculture project performance can be achieved or at least enhanced in Nigeria.

Literature Review Strategy

The University of Walden Library database served as the primary source of materials used in this study. The database of university complemented by other restricted access databases including University of Success online library and Questia.

The databases accessed through these electronic libraries as well as search engines used include:

1. Sage Premier
2. ScienceDirect
3. Taylor Francis Online
4. The World Bank Open Knowledge Repository
5. Database of Abstracts of Reviews of Effects (DARE)
6. EBSCOhost
7. IEEE Explore Digital Library
8. ProQuest Central
9. Academic Search Complete
10. Directory of Open Access Journals (DOAJ)
11. Elsevier SD Social Sciences
12. LexisNexis Academic
13. Social Science Research Network (SSRN)
14. Tech Knowledge

15. Thoreau Multi-Database Search
16. Google Scholar
17. ABI/INFORM Complete

The key search terms used for accessing relevant literature include: agriculture funding, agriculture financing, agriculture funding programs, agriculture intervention programs, agriculture budget, budgetary allocations to agriculture, agriculture development assistance, agriculture credit scheme, agriculture impact assessment, agriculture program evaluation, agriculture funding efficiency, agriculture program effectiveness, rural development, social development, income inequality, and poverty alleviation.

Types of materials produced by the literature search include books, peer-reviewed journal articles, Walden University dissertations and thesis, Google books available online, working papers, policy research reports by international organizations, project evaluation reports, World Bank, United Nations Development Program and National database on socio-economic indicators.

The majority (about 90%) of the articles used were published within the last five years that is, articles and papers published between years 2012 to 2016. Very few of the articles and papers reviewed predate 2012 publications. The earlier reports were widely original documents that laid out key theories and concepts discussed in this report.

Theoretical Framework

The first-best resource allocation theory of Arrow et al. (2012) which considers first, the problem of measuring welfare change along the first-best optimal was viewed to

be suitable for this study, hence its adoption as the theoretical foundation. The proponents of the theory rely on the concept of genuine saving which has gained much attention in the literature on welfare measurement in dynamic economies. The application of the first best allocation optimality criteria to the concept of sustainable development was first developed by (Solow, 1974). Solow argued that achieving sustainability is possible when current expenditure or utilization of resource stock leads to the net capital formation (Ruth, 2013). Subsequent work on resource optimality applied this concept in the field of welfare economics, which attempted to prescribe the most efficient ways of using resources aimed at improving social welfare.

In furtherance of these arguments, the second fundamental fheory of welfare economics states that achieving efficient allocations of resources in the economy is possible through the interplay of initial government transfers, subsequently distributed using market-based instruments. In response to Adam Smith's seminal work, successive economist formulates theories, which were price mechanism based, and efficient allocation of resources. However, Stieglitz (1991) attributed the precise formulation of the theory to works of (Arrow & Debreu, 1954). They argued that optimal allocation of resources could be achieved in redistribution (welfare) programs using instruments such as taxation.

Greenwald and Stiglitz (1986) argued that the presence of market imperfections reduces the welfare benefits of government spending and that government can intervene with specific policies targeted at achieving more efficient outcomes. The defects that existed in the form of information asymmetry represented by the private incentives of

beneficiaries of welfare programs leads to inefficient utilization resources (Stiglitz, 1991). Consequently, the extent to which government can achieve efficient welfare spending depends on the kind of policies it designs to solve the incentive problem. Reviewing the Greenwald and Stiglitz theorem, Dixit (2003) however observed that, in practice, information asymmetry is not the only imperfection that distorts an economy. Consequently, the extent to which government can achieve efficient welfare spending depends on the kind of policies it designs to solve the incentive problem.

The first-best allocation theory relies on the concept of genuine saving which has gained much attention in the literature on welfare measurement in dynamic economies. In this theory, it suggests real saving is an indicator of total net investment in the sense of summarizing the worth of all capital formation partakes by the community over a period. Relying on Arrow et al. (2012) as well as on earlier seminal work by Solow (1974), Hamilton and Hartwick (2014) demonstrated that net savings have significant positive effect on sustainable wealth creation. In adapting theory to this study, Arrow et al. (2012) argued that genuine saving constitutes an exact measure of welfare change (asset-base, agricultural output, income per capita and household income) over time difference if the resource allocation is first best. The authors further applied the theory to the measurement of sustainability of per capita growth in five countries namely United States of America (USA), China, India, Brazil, and Venezuela. They found that sustainability capital growth was significant in 3 countries (China, India, and the USA), marginal in 1 country (Brazil) and absent in Venezuela. In their work Pender, Weber, Johnson, and Fannin (2014) draw heavily from the framework to argue that sustainable rural wealth creation is achievable

with investment in the right kind of asset and taking into consideration the appropriate situational, economic, institutional and policy contexts.

The utilization of net savings as a measure of change in welfare over time, given conditions of optimality, is consistent with existing literature that defines genuine saving as an indicator of sustainable development. The World Commission describes development to be sustainable if it meets the need of the present without undermining the ability of future generations in meeting their needs and requires welfare to be non-declining (Arrow et al., 2012). Consequently, the a priori expectation is that agricultural financing from the different funding sources increases genuine savings proxied with asset-base, agricultural output, income per capita and household income.

Overview of Intervention Funding Programs

The conceptual basis for exploring the possible link between the outcome of agricultural funding programs and the organizational characteristic of the agency providing the financing in the old debate between public versus private, social versus economic, organizational theories has long been there. A brief historical overview provides some background resource for understanding any conceptual link between the manner that agriculture intervention funds are sourced and applied, and the likelihood of success of any given funding model.

Intervention programs started with the state's involvement in directing social and economic development. Knutsson (2009) traced the history of the design and implementation of intervention programs to what the "first development decade" as it is commonly referred to, where the state played a prominent role as "the principal agent and

guarantor of development" (p.14). However, Knutsson focused on national policy as it pertains to economic growth and expansion. In this regard, the interventionist state is not only involved in the regulation system but is also actively involved in directing resources towards productive activities that are deliberately favored by the state. The notion of intervention did little to address the pertinent (in the context of this dissertation) the distribution of economic benefits among the various demographic segments of society. It nevertheless provides a starting point for analyzing shifting paradigms of development, which has increasingly shifted the principal focus from the logic of the market to planned intervention by the state.

The notion of the interventionist state does not, on its own, sufficiently address the subject matter of intervention programs aimed at curbing poverty and reducing inequality among and within targeted populations. For one, the concept of the interventionist state as presented by Knutsson (2009) and much earlier, by Evans (1995) focuses on the state's role in industrial transformation and economic growth, especially in emerging economies. Others have argued that traditional models of intervention have not sufficiently addressed the concept of shared prosperity in a pluralistic society (Booth, 2011; Griggs et al., 2013; Sen, 2003; Sen, 2013). The failure of the earlier concept of the interventionist state to address the questions of poverty reduction and redistributive economics side by side with macroeconomics priorities has inevitably provoked intense debate among developments economists as to the primary objectives of development policy.

The discussion over the effectiveness of early development models inevitably spurred debate among scholars on alternative models of intervention. According to Knutsson (2009), attention began to shift away from purely macroeconomic objective in development policy during the second development decade in the 1970s. When it became apparent that reducing economic growth to economic development became impossible to relate" resulting in "a more thorough problematization of development as something more than just economic growth" (p. 15-17). This period brought a new model of direct intervention by the rich countries in "developing countries" through development aid (Knutsson, 2009). Such development projects were aimed specifically at reducing poverty and creating employment, with some of them explicitly incorporating principles of social equity. These discussions offered valuable insight into the ideological origins of targeted intervention in addressing poverty, but also more crucially, the global reallocation of economic resources in a way that recognizes the objective of social equity. The other narrative presents the intervention model not as an exclusive model of development adopted by the state and its government, but as a strategy that was increasingly preferred by multiple agents of development including NGOs, (Non-governmental organizations) as well as local and international development institutions. Similarly, these ideas became noticeably with various development paradigms (Booth, 2011; Griggs et al., 2013) including the modernization school, which "co-opted individual elements of this critical perspective e.g. through more focus on poverty alleviation, employment, redistribution with growth" (Knutsson, 2009, p. 15-17). There is, therefore, the scope for analyzing the policy of intervention programs, both as an idea

shared by different schools of development thought and activity that is undertaken by development practitioners at all levels of governance, local and global.

From the perspective of development theory, the perceived failure of neoliberal, market-oriented agents to address poverty and inequality have led to the evolution of the argument for direct public sector intervention to improve living conditions and redistribute income. These initiatives have taken several forms including, but not limited to, federal funding, national budgets, and international development assistance (Anderson, Brown, & Jean, 2012; Kanbur & Sumner, 2012; Sumner & Mallett, 2012). These national and international development initiatives are being carried out through special intervention programs for the purpose of improving living conditions and raising the income of disadvantaged communities.

Unlike many previous theories of economic growth and development, the theoretical link between intervention fund strategies and poverty reduction is still evolving at best. The conceptual foundations for the design and implementation of intervention programs are found partly in the neo-liberal economic idea, but more generally within the human development paradigm (Kanbur & Sumner, 2012). The neoliberal approach expressed in the policy of international development assistance as a strategy for global income redistribution from rich to economically disadvantaged countries. The human development approach promotes direct intervention at the community, national, and international stage, as a means of expanding economic opportunities for the poor (Kanbur & Sumner, 2012). Most intervention programs strive through humanitarian ideals, and partly because these interventions are usually

multidimensional, involving a broad spectrum of actors, no clear-cut theoretical statements are expressing the relationship between intervention programs and levels of economic prosperity.

The targeted works of literature on intervention programs, policy papers, and normative discussions on the need for purposeful intervention programs as a strategy for improving social and economic conditions in developing countries (Hopkins, 2012; Sachs, 2012; Sumner, 2012).

Selected Agriculture Funding Programs in Nigeria

Three funding programs were selected for the purpose of this research work based on their activities in Agriculture funding programs in the state.

National Fadama Development Project

The National Fadama project was a direct response to a historical problem that had both restricted agricultural operations and curtailed income of rural farmers in Nigeria. A major constraint on agricultural production in Nigeria is the reliance on rain-fed agriculture for crop cultivation (Jumoke, 2012). Rainfed limits farm income to single annual harvest season. As a result, of the limitation of rainfed farms, agricultural productivity for any particular year is largely determined by uncertainties and variations in weather conditions. The Fadama irrigation program was launched by the Federal Government of Nigeria and the World Bank to facilitate dry season cultivation and improve agricultural production especially in the regions of the country that experience small amounts of rainfall. Although according to Ango et al. (2012) the Fadama program was not the first irrigation projects implemented in the country. The new program, known

as the National Fadama Development Project (NFDP) was initiated in the arid and semiarid states of Bauchi, Jigawa, Kebbi, and Sokoto (Ango et al., 2012). The program started in the 1990s as a low-cost, farmer managed the scheme to replace previous irrigation programs, which relied mostly on top-down planning and implementation models. Its primary goal was to enhance agricultural productivity and the formation of social capital within the rural population.

The Fadama project was motivated more by a social development objective than a technical need to combat the limiting effects of rain-fed agriculture practice. The second phase of the project, tagged Fadama II, was extended to 12 states in Nigeria. In the view of Khalique (2012), the program was introduced in 2004 and specifically sought to "increase the incomes of farmers, fishers and other poor people in Fadama Areas" (p.64). The objective is consistent with the policy goal of the project to empower communities and build local capacity. A distinction of this phase of the program is the focus on the vulnerable groups, which explicitly identifies not only women and the unemployed but also widows and people living with HIV (Khalique, 2012). The Fadama project, which initially addressed the problems associated with rain-fed agriculture in the northern arid zone, thus became a social security instrument in its implementation across Nigeria with the Fadama II phase. The project relies on plans and priorities identified by user communities for asset acquisition and determination of resources required for crop production and livestock breeding. The shift from a mainly economic focus to social welfare would show the Fadama II project as a top-down model. But the implementation

mechanism indicates a more participatory methodology, which is consistent with the objective to empower rural communities.

Beyond the project conception and resource determination responsibilities that the NFDP concedes to the farmers, the National Fadama program tries to operationalize, as much as possible, the ‘local ownership' principle. In this regard, beneficiaries are organized into management teams and are charged with the responsibility to recover cost as well as tight credit for its members (Jumoke, 2012). Khalique (2012) summarized this component of the program as the "shift from public sector domination to Community Base-Driven Development (CDD) approach, built around community-defined priorities" (p.65). Community Base-Driven Development focus provides the key performance criteria, based on the social and economic impact on beneficiary communities.

Stronger evidence of the Fadama social development objective in a way are subsequently found in phases of the program implicitly excludes or, at least, give less priority to more well off community dwellers. The Fadama III version of the program, introduced in 2009, currently operates in all 36 states in Nigeria (Nkonya, Philip, Mogues, Pender, & Kato 2012). The Community Driven Development (CDD) focus of the second and third phases caters specifically to the needs of poor and vulnerable rural farmers.

The expansion of the Fadama program also created the need for collaborative funding structure by multiple development agencies. The World Bank and the Federal Republic of Nigeria initially funded the Fadama project. The project was financed primarily by loans obtained from the World Bank. The involvement of the development

finance institution began with a USD$67 million from the bank in 1991 (Porter & Zovighian, 2014). Funding sources for the Fadama program were later expanded to include the African Development Bank (AfDB) and the State Governments. While it is also possible to assume that increased participation of funding agencies is evidence of the success of previous phases of the program, the evidence at this stage points more to the growing scope of Fadama III in more communities across all the states in the country.

Notwithstanding the still evolving arguments on the performance of the Fadama projects, the significance of the program is observable from the size of the financial commitment about total sectoral allocation to agriculture in Nigeria's federal budget. At the time of implementation of the second phase of the program, financial allocation to the project represented about 36% of the total allocation to the agriculture sector and 2.7% of the national budget for the 2007 fiscal year (Pretty, Toulmin, & Williams, 2011). Implicit in this collaborative funding model is the larger thematic issue of the role that the different financing institutions play in shaping the governing structure of the Fadama funding program.

National Program on Food Security

Like the Fadama program, the NPFS was conceived to improve agricultural output and enhance the livelihood of beneficiary farmers. However, unlike the Fadama project, the NPFS is designed to address more the technique than the scale of agricultural production. The aim of the NPFS is to increase farm output through the adoption of technology and better utilization of land and inputs (Ayoade et al., 2011). The program is an offshoot of the Food and Agriculture Organization (FAO) Special Program for Food

Security (Watts, 2013). The FAO particular program was launched in 1994 to address the shortfall in global food production (FAO, 2013). The program as initially conceived aimed to achieve global food security through extending the benefits of technical efficiency to parts of the world experiencing the greatest gap in both technological capacity and food sufficiency.

The Nigerian National Program on Food Security subsequently evolved into a local version of the unique international program, but primarily as a result of the national government's request for assistance. The program also acquired a multi-stakeholder identity right from its planning stage. The Nigerian government, the FAO, and beneficiary communities participated in reviewing the request of the government. According to Watts (2013), the program that started in Kano, Northwestern Nigeria, later extended to all the 36 states. The aim of the program was to achieve a rapid increase in productivity and food production in an economically and environmentally sustainable basis emphasizing the use of tested technologies, grassroots participation, and south-south cooperation. The local ownership element of the NPFS fit into the defining philosophy of agriculture intervention programs in Nigeria.

Evolution of funding pattern for the shows significant consistency with the manner the multiple agencies became involved in providing funding for Fadama program. Initially, financial resources for the NPFS were provided entirely by the Federal Government of Nigeria, with an initial financial commitment of $45 million (Oruche, Atala, Akpoko, & Chikaire, 2012). The second phase of the program which, commenced in 2006, included an animal production health sub-component, was jointly funded by the

government and international funding from African Development Bank and Islamic Development Bank (FAO/Nigeria, 2013). Like the Fadama program, this pattern might be more the evidence of the expansion of the program to other parts of the country than a promise of effectiveness.

Enlargement of the NPFS also indicates a policy commitment to extend the technology to different subsectors of agricultural activity, not just the geographic spread of beneficiary communities. Ojo and Adebayo (2012) noted that the program range includes 109 farming communities and includes the "dissemination of information on proven and accessible technologies" (p.208). Similarly, the second phase of the program, which was extended to cover 327 communities, focused mainly on technical and managerial assistance given to beneficiary communities (FAO, 2013). This phase of the program which, commenced in 2006, included an animal production health sub-component. This subcomponent addresses key constraints to livestock and poultry production. The primary focus on the technique of production indicates that any performance criteria to assess the program success would be based more on efficiency consideration than on physical volume of output.

In the implementation of the NPFS, the program managers recognize the diversity of agricultural operations and unique needs of individual communities. The program application comes in different components. The objective of the subsequent phase of the program, known as the expansion phase, is to integrate the various elements of the programs and also achieve greater decentralization of implementation to allow local governments as well as beneficiary communities greater leverage and ownership (FAO,

2013). The notion of "accessible" technology, which is prominent in the NPFS's objective, would, therefore, appear to be a direct consequence of the focus on local ownership.

The objectives local ownership and accessible technology does not, however, define the primary goal for which the government designed the NPFS. The main aim of the NPFS, like the Fadama project, is poverty reduction. The concept of food sovereignty, which recognizes the right to nutrition as a fundamental right of every citizen is central to its aim and implicit in its nomenclature (Shepherd, 2012; Buckley, 2013). Achieving the national macroeconomic objectives the back borne to the implementation of the program. The aquaculture and inland fisheries project are designed to reduce significantly the volume of fish imports, which for instance stood at 681 metric tons in the year the program was implemented (Headey, 2013). The FAO (2013) surmised that the components of the program, which adopted a collaborative sharing of responsibilities between designs; implementation and funding, led to a high degree of success concerning local capacity-building. However, the necessary distinction between the primary and secondary objectives of the program enables a clear-cut evaluation of whether such achievement in building local capacity has translated into the desired outcome of poverty reduction and food security.

Community Based Agricultural and Rural Development Program/ International Funds for Agricultural Development (CBARDP/IFAD)

The social development objective of the CBARDP is consistent with earlier programs reviewed so far. However, the goals go further regarding its specificity of its target population. The primary purpose of the program was an improvement of the

livelihood of rural communities. The program focused particularly on the living conditions of women and other vulnerable groups in these communities (Shepherd, 2012). The goal of the program is community development through a local capacity building. The program is community base participation models and the concept of rural empowerment (Ahmadu, Ahmad, & Hamsan, 2012). In a way that would suggest a common theme running through agriculture intervention programs in the country, the CBARDP shares both the local ownership and capacity building objectives of Fadama and NPFS.

The primary element of the IFAD/CBARDP, which identifies it as a first community-driven program, is the requirement for individual beneficiaries to have been members of a community group where they exist and, alternatively, to form such groups where they do not exist already. Besides the requirement for such groups to elect their leaders, the groups are responsible for formulating plans for implementation of the particular CBARDP project in a beneficiary community (Galadima, 2014). On the face of it, the robustness of the provision for self-governance may, therefore, constitute a critical success factor in the assessment of project performance.

In more ways than the community participation model of the CBARDP, the program derives its stakeholder-based identity from events that predates its conception and inauguration. The program initiated in 2003, its origins date back to 2000, when the Nigerian government, supported by the World Bank and the United States Agency for International Development (USAID), commissioned a rural sector study (FAO, 2013). This study gives birth to the Rural Development Strategy for Poverty Alleviation, which

aimed to improve the economic condition of the rural agrarian population. The development strategy formed the basis for subsequent discussion involving the African Development Bank (AfDB), IFAD, the World Bank and the FAO in 2001. Subsequent revision of the program at a workshop comprising the Nigerian government and program donors produced an agreement to establish the CBARDP based largely on a community-driven development model. A multi-stakeholder approach to community development thus represents a significant characteristic that the CBARDP shares with the previous agriculture intervention programs, yet the feature is so prominent in its policy objectives that it almost sets it apart from the other programs.

Social Intervention Programs

Social development practice typically involves the provision of resources and material to enhance the livelihood of poor or disadvantaged populations. The policy of providing development aid as practiced by the governments of countries in the developed North also carries a geopolitical logic, with the objective of solving global security. It is evident that socioeconomic philosophy of reducing poverty through the flow of development assistance from the rich to the poor is yielding the needed result. Knutsson (2009) observed that there is a strong tie between the cold war-era interventionism designed by Western powers to counter the influence of communism and maintain geopolitical hegemony between the west and the east; post-cold war development assistance is to a large extent tilted to a new global security threat. There is also a direct link to poverty and "mal-development" which are direct causes of such global problems as mass migration, diseases, drug trafficking, terrorism, political instability, etc. Amen

(2011) argued that the logic of interventionism in the form of development assistance was, therefore, transform from a weapon against communism to an instrument for preventing poverty-related problems from spilling over and affecting other parts of the world. Thus, the first suggestion that intervention activity may be both self-serving and altruistic.

Global equity, peace, and security, which appear as logic of globalization, are the original justification for poverty-based intervention programs. It would also seem that emerging trends in the global agro-economy seem to be shifting the focus of agricultural intervention programs from the primary goal of poverty reduction to one of wealth accumulation. Mustapha (2011) noted that the current World Bank funding policy, which was devoted to raising the production standards for social pleasantries, is "tilting towards the selective development of commercial agriculture" (p. 559). Akram-Lodhi and Kay (2012) on the other hand argued that global agri-business goals are increasingly influencing the emerging trend such as the World Bank's new policy objective. Mustapha identified this trend towards global market-driven commercialization in the current national policy on agriculture in Nigeria. He argued that the enormous volume of imports was the primary concern and replacing agricultural imports with mass exports of agricultural products is needed. Therefore, current agricultural credit and infrastructure funding projects are designed for building large, commercially viable farms, despite the current rhetoric on support for local, small farmers. Implicit in this argument is the suggestion that they are currently confusion in objectives of agriculture intervention programs, which may be hindering the primary goal of poverty alleviation.

By these assertions, the policy of promoting commercial agriculture in developing countries, particularly in Nigeria, immediately throws up obvious ideological contradictions at least concerning the outcomes that government and World Bank funded agricultural projects are designed to produce. Pro-poor interventions in agriculture are designed to address not only food poverty but also income poverty (United Nations Development Report, 2011). Commercial agriculture directly affects personal income through wages and sale of farm produce. Commercialization of agricultural operations also enhances the sustainability of intervention projects funded through grants and credit. However, such market-based approach to peasant agriculture risks further marginalizing farmers with a little technical capacity to guarantee efficiency and profitability of farming activities. Bernstein (2004) summarized the inevitable outcome of this paradox in the strategies designed to reduce inequality as well as promote sustainability of the intervention. Bernstein described this dilemma as one in which the natural question of using capital in generating accumulation from agriculture is progressively the right way of solving the problem of inefficiency of the natural question of labor, which is more concerned with "what to do with the surplus rural population" (p.190). The issue of designing and financing agriculture raises the obvious question of whether the way in which an agriculture intervention program might affect the potential to reduce rural poverty.

The evolving debate on the impact of defining intervention objects on their effectiveness seriously questions the propriety of applying same intervention remedies to all poverty situations. Beyond the universality of the manifestations of poverty, the

definition of the objectives of intervention funds raises methodological questions concerning the measurement of the effectiveness of intervention programs, especially in developing countries (Oguzor, 2014). This conception of the objectives of intervention policy aids the understanding of intervention programs as a tool for fighting poverty but also complicates the measurement of the performance of specific programs concerning the extent to which they can fulfill the desired objectives.

Categorization of the major funding types into subcomponents further aids the understanding of how sources of financing might affect effectiveness. To further better the understanding of intervention programs, Obansa and Maduekwe (2013) constructs a three-tier framework to explain the types and sources of agriculture financing. On the first level, they categorized agriculture investment broadly into internal and external sources, corresponding to domestic and foreign sources of finance. On the second tier, they further subdivided each category into debt and non-debt sources. Internal non-debt sources include repatriated capital, savings, and equity while its debt component included bank credits, Treasury bills and development stocks (Obansa & Maduekwe, 2013). External non-debt sources include aid and foreign (direct and private) investment while the debt component consists of all types of foreign governments and from private as well as development banks. Different management and implementation models also characterize agriculture programs funded by various sources. Analysis of specific agriculture funding programs covered in this paper in the next section is according to nature of financing and management structure.

The Concept of Poverty, Inequality, and Economic Growth

The debate on poverty reduction, equality in income and economic growth has been on the center stage within the academic community and the policy sphere for a very long time. The World Bank has adopted a new metric as a measure to end the extreme poverty by 2030 (Narayan, Saavedra-Chanduvi, & Tiwari, 2013). To achieve this goal the term "shared prosperity" is being proposed targeting those populations of people living on less $1.25 a day Basu (2013). Narayan et al. (2013) and Cord, Genoni, and Rodriguez Castelan (2015) noted that adoption of shared prosperity in poverty reduction is a clear departure from the traditional concept of gross domestic product (GDP) measurement of poverty index to focusing on the severe 40% bottom in each country. Narayan et al. warned that the 40% increase is only possible where the recipients have the same equal opportunity and not constrained by inequality. Basu argued that the concept of *shared prosperity* is possible only when income distribution is allowed to tickle down the bottom and sustained for a period. Milanovic (2013) opined that inequality for a long time has three dimensions, "inequality 1, inequality 2, and inequality 3" within a nation, between countries and globally (p. 3). The study conducted by Basu extends to an x- ray of *growth-inequality poverty* taking into consideration the dimension of poverty index to include headcount ratio, poverty gap, and square poverty. Basu showed that income inequality tends to increase poverty while economic growth decreases poverty. Stern (2011) summarized his contribution to the subject by asserting that investment by government and private sector particularly in agriculture is a logical means of ending poverty and inequality if the focus is to the grassroots where the majority of the

population dwells. According to Stein (2011); Milanovic requires aggressive investment and purposeful necessary for agricultural development. This debate suggests a liberal consensus on the link between inequality and perpetuation of poverty and the policy approaches to addressing the problem.

The Rationale for Agricultural Intervention Fund

The association between agricultural financing, financial institutions, and the State have a long historical antecedent. Policymaker has long recognized the political interference in funding farming. However, government participation in the financing of agriculture reduced in the late 1970s (Martin & Clapp, 2015). The development within the period is useful for determining, through empirical study whether government mode of funding intervention programs has been more or less productive for rural farming communities.

Agricultural intervention funds have experienced significant growth in numbers and volume in recent years. It has underscored public and private sectors' interest to help address the resource constraints for achieving food security (Gruere, 2012). In the views of Materia (2012) the increasing poverty level and vast income inequality has played a significant role in the emergence and growth of such funds, especially in light of higher agricultural products prices and severe climates that defied longer-term panacea. According to Eneji, Umejiakwu, Ushie, and Ifeoma, (2013) agriculture is critical for sustainable development and poverty reduction. The notion of sustainable development points tentatively to the assumption that agriculture can be an effective tool for achieving inclusive growth.

A valid case made by researchers is that it is the manner of the application rather than the size of funding that determines the effectiveness of intervention funds. Hanjra and Culas (2011) argued that there is a tremendous growth of agriculture in the continent of Africa, and agriculture still holds much promised and potentials in spite of the disproportionately lower share of investment in the sector from governments and donors over the last decade. Hanjra and Culas (2011) also posited that agricultural productivity and rural employment could offer increased income to the poor and provide food security and income diversification to vulnerable communities. They further argue that given that agriculture dominates the grassroots economy in most African countries, increased productivity in the sector will remain a major driving force and a critical component of inclusive growth.

The argument that the method of application of intervention funds creates greater impact than the size of funds does not necessarily justify reduced funding of agriculture. External financial resources are critical for economic and social development the world over, especially agriculture (Probst et al., 2012). Hounkonnou et al. (2012) indicated that Intervention funds account for a sizeable proportion of the amount of resources available for agriculture and rural development. These resources are therefore an important means of improving farm capital investment especially in Africa Hounkonnou et al. (2012) without which there may be no progress in the agricultural sector to fulfill its expected roles or millennium development goals (Tscharntke et al., 2012) adequately. These functions include achievement of self-sufficiency in the domestic production of food,

revival of agricultural export crops production, generation of rural and agricultural employment and improvement of rural income and welfare.

Pro-poor Intervention policy also raises a crucial question about whether intervention funds generally can produce better results when applied to other sectors than in agriculture. Materia (2012) further described in Cleaver (2012) that agricultural investment has been shown to yield higher gains for the poor than none – agricultural investment. Van Auken and Carraher (2012) support the assertion funds for agricultural intervention attempt to achieve sustainable natural resource management for those dependent on farming for their nutrition and livelihoods needs. However, Banerjee et al. (2014); Narayan et al. (2013) proposed purposeful investments in agricultural research, farming technologies, and institutional infrastructure are necessary for an increase agricultural output for effective poverty reduction and inequality. In terms research and technology, however, it is not entirely feasible to separate investment in agriculture from other sectors whose research result or technological development may have collateral or indirect benefit for agricultural application.

Measurement and Indicators

Assessments of intervention program have been carried out on both policy and academic purposes. Attempts to draw general (theoretical) conclusions on the effectiveness of intervention program have led to the evaluation of many intervention program spread across different countries. Coady, Grosh, and Hoddinott, (2004) evaluated 102-intervention program in low and middle-income countries spread across four different subregions. But even these studies covering a broad range of intervention

program across several regions (Africa, Asia, and South America) have not produced a clear statistically significant relationship between intervention program and poverty levels. There are mixed results concerning the effectiveness of intervention program in most studies. Typically, the measurement parameters have consisted of a finite set of predefined indicators and similar benchmarks. This practice that has dominated most intervention program and their appraisal mechanism stem from the dominance of preconceived notions by outsiders intervening in the lives of poor communities (Kilby, 2012; Sumner, 2012; Sumner & Mallett, 2012). The absence of unanimity of the overall verdict on the effectiveness of intervention programs, incidentally, appears to spill over to a wider debate on the appropriateness of the measurement criteria adopted, or even the choice of indicators of progress in the communities that enjoys implementation of the program.

The development of success criteria for agricultural funding programs, therefore, varies across programs and are widely determined by the particular social and economic objectives that each funding program is designed to achieve within targeted communities. However, the academic literature has produced a broad categorization of the different goals which agricultural programs are designed to meet especially in developing countries. Gabbre-Madhin and Haggblade (2004) summarized key success criteria in African agriculture funding programs that include "production growth" and "increased farmer income and foreign exchange earnings" (p.747). On either end of this range of performance outcomes, are related primary activities and secondary indicators, which serve as mechanisms for program implementation and justification for funding policies.

On one end of the spectrum are particular product (crop and livestock) enhancement projects, which constitute the practical tools for program implementation (Beddington et al., 2012). Outcome indicators comprise of social development objectives of poverty reduction, welfare enhancement, social equity, and reducing inequalities (Dillon, 2011; Dimelu, Bonjoru, Emodi, & Madukwe, 2015; Kassie, Shiferaw, & Muricho, 2011; Macombe, Leskinen, Feschet, & Antikainen, 2013). Ultimately, objectives and performance indicators of intervention programs are the assessment criteria for all projects.

The goals and indicators, in turn, define the assessment methodologies appropriate to each intervention program. Ezeh, Anyiro, Ehiemere, and Obioma (2012) adopted a primarily quantitative approach to assessing the performance of Nigeria's National Fadama I project in the southeast of Nigeria. They measure project performance in the southeast in term of its output, income, and labor use. Evaluation of the second phase of the project was extended to measure more social outcome measures such as poverty incidence and poverty gap within beneficiary communities, before and after implementation of the program. However, I recognize the possible presence of exogenous factors in the determination of poverty and thus find the first part of the assessment more statistically tenable.

Performance indicators are either program-specific or apply to different intervention programs across the board. Umar and Abba (2012) measured the performance of Nigeria's Agricultural development Projects using output, income, access to credit and standard of living (proxied by asset acquisition, ownership, and growth). Ike

and Nzokwe (2012) adopted performance indicators which are either exclusive to credit finance or applicable to other types of funds in assessing the performance of microcredit. They used the rate of repayment/default by beneficiaries as well as return on loaned funds utilized by recipients of the funds to finance different economic activities that constitute the commercial farming operations. In comparison, the productivity of labor is compared with wage rate and of return on loaned funds was measured against interest payable. Methodologically, the adoption of different performance criteria for various intervention programs makes it easier to conduct project-specific performance assessment but less valid to compare performance across the board.

Perennially, several intervention programs have been carried out in the northeastern part of Nigeria. Some of these projects include the Agricultural Development Projects; Fadama Phase I, II, and III projects; and National Program for Food Security (NPFS). Studies have also been carried out to determine the impact of these programs on the livelihoods of affected communities (Ango et al., 2012; World Bank, 2012). Like similar studies carried out in other locations, the results show mixed on the effectiveness of intervention programs. In the application of funds to small and medium scale enterprises, either as agricultural credit schemes or grant to farmers, the studies also found that across populations in the different beneficiary communities, the utilization of the funds yield different (positive and negative) results for various agricultural projects. Some intervention resources programs were successful in some states; others were not so successful while others fall in the classes of outright failures.

Concept of Social Equity as Performance Objective

In development thinking, the essence of intervening in the economic lives and livelihood of entire communities, or population segments within communities, have traditionally centered on previously disadvantaged constituencies. The fundamental concepts of equity participation and inclusion are the key objectives of expansion of choices and capabilities (Gebara, 2013; McDermott, Mahanty, & Schreckenberg, 2013; Sen, 2013). According to Sen (2013), the assertion is consistent with earlier work of Knutsson on the history of development thought and policy, traced to the evolution of appropriate intervention strategies to the historical development of development concept, and the shifts in paradigm from one event generation to the next.

Inequality considerations of intervention program efforts place intervention policy as primarily a modern concept of development. Knutson (2009) suggested that the idea of promoting social development, through special programs for intervention at the macroeconomic level, evolved from "conventional economic growth's inability to eliminate poverty and inequality" (p. 20). Knutson pointed correctly to the Basic Needs Approach (BNA) to development, which prescribes direct poverty alleviation and a development guarantee for vulnerable groups. This philosophy of inclusive development became necessary following from the more or less collateral (negative) impact of the modern development in the 1970s, which created greater inequalities and social exclusion. There is policy logic in the development models, which seek to expand opportunities for disadvantaged groups.

The Assessment of Agricultural intervention projects to poverty alleviations has a footprint for their economic performance within targeted communities, and also for their ability to extend participation to marginalize communities historically. Researchers on the impact of agricultural projects on the wellbeing of marginalized groups tend to focus on women as an integral but often neglected segment of the rural populations (Newton, Agrawal, & Wollenberg, 2013). Therefore, the consideration of intervention programs with a demographic focus would be useful if they fail to meet the vulnerability criteria.

The vulnerability approach of most intervention projects is a direct consequence of structural imbalances within rural populations. In spite of the fact that women predominate the agriculture sector in Nigeria concerning the labor force and food crop cultivation, they are disadvantaged regarding factor endowments and access to services offered by various organizations (Fapohunda, 2012; Sen & Grown, 2013). Federici (2011) argued that the major impediment faced by women farmers in Nigeria is the lack of access to land, which is a vital resource for agricultural production. Land tenure problems, which ordinarily constrain agricultural production in most rural communities, impose a greater constraint on women who are disadvantaged by traditional asset accumulation and inheritance practices (Ezeh et al., 2012). Access to factors of production thus constitutes the key assessment criterion for programs in the vulnerability category.

Lack of access to credit and farm inputs compound the problem for women farmers. Ango et al. (2012) made a connection between land ownership and farmers' demographics, which indicated an indirect effect on women participation in agriculture

funding programs in Nigeria. The study did not show significant variations in the performance of funds disbursed to male and female beneficiaries in northwest Nigeria. There is a restriction of Women recipients of the program by the limited access to land resources. Findings of this nature reinforce a reality of gender disparity in the impact of agricultural funding programs, which, although not created by the actual program implementation, originates from more systemic, pre-existing factors affecting resource ownership and distribution. However, the cumulative effect of these multiple deprivations is the lower volume of production for the entire agricultural sector.

The problem faced by vulnerable groups within local populations forms an important aspect of the conceptual analysis of the effectiveness of intervention projects. Ifenkwe (2012) confirmed these assertions in a study to determine women's participation in a given agricultural extension program. Ifenkwe (2012) showed that the program selected for the study was plagued by what the author termed agency-related problems and client-related problems. While the first factor relates to the poor delivery of extension services by extension workers, the other refers to existing economic, social, and cultural issues within beneficiary communities, which represent the primary sources of poverty and level of social and economic development in rural communities. Reversing this situation requires direct intervention through projects that target increased participation by women farmers (Awotide, Karimov, Diagne, & Nakelse, 2013; Ayoade et al., 2011). The link between these conceptual issues and intervention program design is evident in the provisions in these programs and emphasis on disadvantaged groups.

The findings of the studies on disadvantaged groups within local populations are consistent with the new philosophy that has shaped the design and types of following agricultural funding programs by both government and international development institutions in the last two to three decades. The Agricultural Development Project (ADP) established in 1972 by the Nigerian government aimed to "increase food production and to raise the income of small-scale farmers (Haruna & Abdullahi, 2014). The objectives of the ADP include gender mainstreaming through selective targeting of previously disadvantaged groups of the rural population by components of the program. The state government versions of the program recognize the role and have incorporated the needs of women engaged in agriculture in the country (Federici, 2011). The designers of the objectives of gender equity within these intervention programs do not, however, make any claims to eliminating gender-related practices within the local populations.

Similarly, international donor agencies have also reflected gender equity in the design and implementation of recent intervention programs in the agricultural sector. However, results of the assessment carried out on these programs continue to produce negative results regarding impact target demographic groups. Ayoade et al. (2011) noted an improvement in agricultural activities over a decade of World Bank support for extension services to farmers through the agriculture development project in Nigeria. The projects have failed to register a positive impact on women farmers in southwestern Nigeria. A special Women in Agriculture program was launched to cater to the unique needs of the multitude of women engaged in agriculture in the country. Even then the actual adoption of the Women in Agriculture program has had its share of

implementation problems in places where it has been implemented (Ifenkwe, 2012). Given the results these studies and assessment carried out on intervention programs designed to incorporate gender equity, the programs continue to produce negative results concerning impact target demographic groups.

At least one study explains continuing gender disparity regarding structural issues associated with the type of intervention. Okoedo-Okojie and Orhiaki (2012) found little impact of the ADP program's extension services on women farmers in southern Nigeria. To them, the effect is due to some aspect of the program discriminates against women poultry producers that few women are engaged in conventional poultry production in the region in the first place.

The gender disparity applies to technical as well as financial limitations. Croppenstedt, Goldstein, and Rosas (2013) determined that technical efficiency of agricultural cultivation by women farmers is usually low in northeast Nigeria owing to the inaccessibility of resources to women farmers. The inaccessibility is not only regarding farming inputs but, most significantly, credit and extension services.

The persistence of gender disparity concerning income and benefits from intervention programs raises salient questions about the capacity of intervention programs to address gender practices embedded within communities. Ayoade et al. (2011) observed that despite extraordinary initiatives by World Bank to design a particular program to cater to the needs of women farmers, women still lack access to agricultural inputs and adequate extension services. However, Croppenstedt et al. (2013) suggested significantly higher levels of participation of women as beneficiaries in agriculture funding projects.

Croppenstedt et al. showed that nearly two-thirds of recipients in the government/World Bank funded irrigation program are women. But then, the literature also suggests that such preponderance may only occur in locations similar to the study area, where youth school enrollment is increasing coupled with growing rural-urban migration of male farmers. Ezeh et al. (2012) found a higher incidence of poverty among female beneficiaries of the Fadama project than their male counterparts, whose farms size and farm incomes were significantly higher. Even then, the preponderance of women recipients of the program in the southern part of the country does not in itself provide conclusive proof of greater positive impact on gender equality.

Funding Sources and Funds Efficiency

One practical way to investigate the link between sources of funding for agricultural projects and their respective efficiencies is to disaggregate agricultural activity into their fundamental aspects. Mogues and Rosario (2015) identified six broad areas for the undertaking agricultural activities through public spending. These subsectors include (p.42):

1. Agricultural research
2. Agricultural extension
3. Agricultural input supply and subsidies
4. Agricultural financial services
5. Grain market stabilization
6. Food security

Concerning agriculture research funding Liebenberg et al. (2011) suggests a strong link between spending on agriculture research activities and agricultural productivity. Liebenberg et al. used a time series data from South Africa, which showed that agricultural funding was the highest during a 50-year period before 1970 when the country occupied a leading position in agricultural production among the leading countries in the sector. Conversely, South Africa lost its leading position in agriculture production after 1970, for almost 50 years that total spending on agriculture research declined progressively.

A type-of-funding typology provides the closest description of a source-of-funding methodology found within research literature. Porter et al. (2012) study the link between types of funding for research programs and productivity of agricultural research activity. Porter et al. compared the efficacy of institutional funding versus project research on the one hand and centralized versus decentralized research financing mechanisms on the other. Porter et al. suggested that the level of determination of efficiency or inefficiency associated with each funding type or source is by the appropriate incentives that each source of financing offers individual researchers. Porter et al. found significant inefficiencies related to centralized funding provided by financing agencies as opposed to a decentralized model of funding administered by research institutions. These inefficiencies exist both concerning efficiency allocation and the transaction costs incurred by individual beneficiaries, especially in obtaining funds to finance personal agriculture research projects. Mogues (2015) similarly made the point about high transaction costs and allocation inefficiency associated with aggressive grant

type of funding. Like Porter et al., Mogues compared formula funding to competitive grant project financing for agriculture research. In this case, Porter et al. identified the primary source of allocation inefficiency in the economic and political incentives facing land-grant administrators. One way to reduce or eliminate distribution inefficiencies in these funding programs could, therefore, be to address the incentive problem associated with the particular source of financing.

The traditional distinction between market-based and public sector approaches to resource allocation shapes the analysis of funding types for agricultural projects. Stads and Beintema (2015) presented the difference between formula and competitive grant funding as one between a predominantly public sector and a mostly private sector associated funding. This distinction gives rise to the third category of financing for agriculture research, which they termed earmarking or pork barrel funding. Stads and Beintema (2015) concluded that funds allocated to projects are more of political reasons rather than that economic viability of the project and that for ongoing projects, they equally assigned funds to projects even where there is no compelling need for additional funding.

The classification of financing types according to public versus private source, even in the case of formula and competitive grant funding is not always mutually exclusive in practice. Stads and Beintema (2015) made the same point about greater efficiency and productivity associated with formula funding in contrast to a competitive grant financing system. However, Stads and Beintema did not present the distinction regarding public versus private sector investment types. They suggested that undertaking

both funding models can be by public sector (government) institutions, arguing further that a reallocation of federal formula funding to competitive grant funding lowers state agricultural productivity and, in this sense, is a nonoptimal agricultural policy (Stads & Beintema, 2015). This conclusion is also significant with findings of previous studies (Porter et al.; 2012; Stads & Beintema, 2015). First, it is consistent with the argument in support of the relative superior productivity of institutional funding over project financing; it also offers a framework of sorts for understanding how the recommendations on funding mix and financing substitution as a policy in practice in implementations.

However, some researchers indicated that limitation of allocation problems might not as a result of the area of agriculture research neither funding nor localized within a particular political economy in the developed world. While Stads and Beintema (2015) addressed the efficiency questions related to agricultural research spending in the United States, Mogues and Rosario (2015) surmised that allocation decisions based on political rather than economic or managerial considerations result in suboptimal funding and even inequitable distribution of resources for individual projects in the entire agricultural sector. Mogues and Rosario (2015) covered productivity factors in agricultural spending in Nigeria. The introduction of the political element in the debate raises the possibility that intervention projects designed to eliminate within-group inequalities may ultimately generate between-group differences.

These conclusions suggest that the productivity variations among funding models for research or other types of agricultural activity may not be due entirely to differences in types or sources of finance. Likely extraneous factors, which though they may appear

exogenous, indirectly determine the effectiveness of funding programs through the way they affect the quality of decisions by individual beneficiaries of the programs. These shared factors also derive from pre-existing socioeconomic characteristics of recipient populations. Dahiya (2012) measured incidences of poverty in 20 countries across five regions and found that incidence of poverty is high in Asia but highest in Sub-Saharan Africa. Dahiya (2012) reported that there is a strong positive correlation between education levels and agricultural productivity and between literacy and utilization of government services. Dahiya believed given existing exogenous variable like the standard of technology and available infrastructure, these individual or group-level factors are important determinants of poverty and inequality. To him, these individual/group related factors are crucially responsible for the conditions that create "poverty traps" where "poverty begets poverty and hunger beget desire" (p.11). The study does not contain specifics about government services in question and does not refer specifically to government programs targeted towards poverty alleviation. The three variables indicated in the study (literacy levels, use of public services, and agricultural productivity) provide relevant grounds for further exploring the relationship between decision-making capacities (of beneficiaries), especially financial management skills, and application of intervention funds in particular among the agrarian population.

Compared to the factors considered above (literacy and level of technological development of beneficiary communities), access to financial services offers a more direct but complementary tool for evaluating the determinants of agricultural productivity among rural populations. This factor also stands on its own in addressing the subject

matter of this dissertation, that is, the impact of funding sources on performance of agricultural programs. Butler and Cornaggia (2011) explored a possible effect on access to external financing on the productivity of agricultural commodity, proxied by average corn yield per hectare. They found significant productivity growth associated with access to bank credit. It presents the study with a limiting scope and comparison to countries in sub-Saharan Africa. Studies mentioned are more confined to a naturally developed financial jurisdiction than the subject of this study. Secondly, it measures productivity per hectare of land cultivated, which is not necessarily a conclusive test for project performance in developing countries. However, it addresses a critical variable associated with agricultural performance within rural agrarian communities such as the ones selected for this study.

Agricultural Project Performance Due to Type and Funding Sources

Attempting to establish a logical link between funding types/sources and the success/failure of agricultural projects entails an early process of generalization from evaluating several projects over a time span that covers both project completion and impact assessment. Studies carried out to determine the performance of agricultural programs measures the effects of programs or projects on socio-economic conditions of beneficiary communities. Large-scale studies neither cover multiple projects across different countries, of various versions of the same program in diverse communities. Such studies involve time-series analysis that compares selected pre-implementation parameters to social and economic conditions of beneficiaries after implementation.

Other studies, like traditional program evaluation, typically measure the degree of success by pre-established program objectives. Coady et al. (2004) evaluated 102 programs across countries in Africa, Latin America, Eastern Europe, the Middle East, and South East Asia. Coady et al. (2004) did not produce a definite pattern of performance based on project type or source of funding. However, cases treated in the study were not limited to agricultural funding programs, even though beneficiary communities consisted of poor agrarian communities. Besides, the cases included few community-driven programs, such as the types evaluated in the subsequent section of this thesis, and are covered by the study.

The performance of some types of intervention projects raises important questions about whether or not the government is in the support to intervene in the allocation process in the first place. Rashid, Cummings, and Gulati (2007) evaluated agriculture intervention programs in six countries selected from the Asia. The study reveals that certain kinds of interventions like food market interventions do not produce significant benefits to justify the cost of the programs. Beyond the direct cost concerning transfers and subsidies, these programs further distort the market through exploitation by special interests.

In other multiple evaluation programs, the results appear to be consistent, although the reasons for low-performance vary. Gabbre-Madhin and Haggblade (2004) study various locations across Africa but does not offer such sweeping verdict about negative performance outcomes. They evaluated diverse project types with defined performance criteria including efficiency, equity, and sustainability. The study also

reveals some isolated successes in agricultural programs across Africa, which is either, limited to particular agricultural commodities or specific agriculture process improvement activities. They equally suggest that most successes are localized within communities, implying the possibility of social-cultural characteristics as predetermining factors to agricultural successes.

However, single country or single case studies carried out on agricultural funding programs appear to produce more definitive results on project performance and impact. Dillon (2011) conducts a poverty impact assessment for small-scale irrigation projects in Mali and finds that the projects have the capacity to increase consumption, savings while reducing risks faced by farmers engaged in tropical livestock farming (p. 56). Dillon adapted complementary illustration from You et al. (2011) noted that determining the successes of these irrigation projects are by both biophysical and socioeconomic factors such as the presence of parent water bodies and an environment that facilitate market integration respectively. These situational factors affect the measurement of results of intervention programs just as they influence the performance of the projects.

Results also suggest that they might be performance differences associated with different funding sources implemented across different time frames. Liebenberg et al. (2011) studied the productivity pattern of South Africa's agriculture sector for the last century and found varying levels of agricultural productivity associated with two distinct periods. These times corresponds to two separate patterns of funding for agriculture research. In the first period, which represents 50 years before 1970, public spending on agriculture research surpassed private spending by almost a factor of five. During this

period, the country recorded a very high rate of agricultural productivity. During the second term, that is, 50 years since 1970, South Africa public investment in agriculture research declined progressively about spending by the private sector on agriculture research. Consequently, South Africa agricultural productivity has since fallen compared to other countries including USA and Australia. However, a proper relationship from this study between funding source and level of productivity is set up in the sense that in association rather than causation, since the study also contains data that show the period of higher agricultural productivity in South Africa also corresponds with a period of overall higher expenditure on agricultural research. This second finding has been given appropriate context in a relevant section of this dissertation in the framework that Nigeria experiences the same situation.

So far, performance patterns concerning project types and implementation models appear to be more discernible in the results of single-country studies. Other researchers have tried to enhance the validity of the results by evaluating multiple projects but within a single country where conditions are comparable, and the primary variables may not be significantly affected exogenous factors like differences in political development, cultural practices or economic conditions. Unlike Coady et al. (2004) who considered 102 projects in four other subcontinents across the world, Mogues and Rosario (2015) study is on 179 agriculture-funding projects across Nigeria within a 6-year period up to 2005.

They study concludes that government-funded projects suffer from inefficiency problems. However, Mogues and Rosario (2015) observed that ADPs funded by governments at the subnational (state or regional government) level perform better than

projects financed by the federal government and that even then, the infrastructure components of all classes of projects subsequently suffer from severe maintenance problems. Nkonya et al. (2012) found that among donor-funded programs, projects managed by community associations perform even better than projects administered by local governments. The trend of these results appears to suggest that the success rate of agriculture projects tend to increase the level of project management gets smaller and closer to beneficiaries. Similarly, they observed that infrastructure maintenance and sustainability of program is also more noticeable at the community levels.

These researchers also suggest that size and scale of projects is a critical determinant factor of success in agriculture projects. Mogues and Rosario (2015) find that large-scale projects perform well less than their smaller scale versions. The programs aimed at improved crop varieties for farmers to produce better results than components of the same (or other) programs that promote the use of other (nonseed) inputs. Mogues and Rosario argued that such large-scale projects designed to be adopted in packages of multiple (and sequenced) activities like "seeds of improved varieties and associated improved crop management practices based on the use of fertilizer and crop chemicals" (p. 62). Farmers, who often take "an incremental, gradualist approach, choosing few elements from a complete technology package, do not usually adopt large scale projects in their entirety" (Mogues & Rosario, 2015), (p. 62).

These findings strengthen both the argument for designing projects in small-scale and splitting large projects into smaller components for implementation. One common theme running through the studies reviewed so far indicate that centralized funding

structures where agriculture research funds flow directly from funding agencies directly to individual beneficiaries produce less favorable results regarding reducing inefficiencies and increasing productivity. The converse holds for alternative structures of financing support channeled the funds through institutions engaged in already ongoing agriculture research and development projects. According to Mogues (2015) competitive grant and earmarked funding, as opposed to formula funding from federal sources, apparently reduces productivity or shift the focus of technology development away from innovations that increase local agricultural productivity.

Porter et al. (2012) observed that in spite of the higher cost of obtaining financing directly from (centralized) funding agencies for projects evaluated on a one-off basis, beneficiaries of agricultural research funding nevertheless prefer this kind of investment to institutional funding. Porter et al. noted that the preference by recipients for size and availability of project financing, even though the transaction costs of obtaining finance project grants are significantly higher than the cost of getting institutional funding.

Meta-analytic studies produce useful results concerning explanatory variables. Ogundari, Amos, and Okoruwa, (2012) conducted an investigation to measure the efficiency of agricultural projects in Nigeria and the validity of findings by previous researchers on the subject. Review of 156 literature on agricultural efficiency that yielded 210 observations across the entire (six) geopolitical regions Nigeria, literacy level of farmers happened to be the most important determinant of agricultural efficiency, with experience, age, and family size following in that order as primary determinants of agricultural efficiency identified by the literature reviewed.

Beyond the real constraint of availability or type of funding as a major determinant of beneficiaries' choice and preferences, Porter et al. (2012) identified a less objective factor which influences beneficiaries' demand choices of types of funding. In the case of agriculture research, elements of the individual recipients' objective function are identified as relevant to the beneficiary's behavior. The previous study, therefore, suggested that regarding project finance mechanism, beneficiaries might be driven by individual-level objectives, which negatively affect the marginal productivity of agricultural research funding.

Relative Merits of Funding Mix Versus Funding Substitution

The technique adopted in the preceding section for attempting a general theory of agricultural project performance based on types and sources of funding assumes that for each project considered; the conception, implementation, and financing are undertaken exclusively by a single organization or institution that solely owns such projects. However, the body of literature reviewed for this study has produced a class of research works that suggest that for some agricultural projects, multiple organizations might be involved in any of the program levels: conception, design, implementation, and funding.

There is significant evidence that there is greater value in a mix of sources of financing than in the unique composition of a particular type or source of funds. Obansa and Maduekwe (2013) believed that there is an appropriate mix of agriculture financing sources required to achieve desired national economic goals. Porter et al. (2012) compared project-funding sources with institutional funding for agriculture research and concluded that the marginal productivity of institutional financing, especially, in the long

run, is superior to other project sources of finance. But in the study, the use of zero-sum prescription of either type of funding for the other was avoided. They suggest a mix of funding types, recommending further project financing which limited to innovative agricultural research projects. Porter et al. (2012) arguments are more appropriately presented regarding the relative mix of the two systems of support, rather than on the infinite merits of either system. The authors concluded that, above all, the issue of efficiency in the allocation and use of agricultural research resources is necessary. The conclusions imply a shift of resources from one funding source to the other to balance the funding mix and thus achieve optimal allocation of funds for agricultural research.

The arguments in support public financing models over the support of private sector funding reveal little consideration to whether project financed with public funds produces better results than projects funded by private investment. Herdt (2012) studied efficiency and productivity of funding of agriculture research and extension activity. However, he observes that a shift in the trend from private sector financing to public financing is emerging more out of necessity than a public policy choice. Herdt (2012) explained that this shift is necessary, due to the public interest nature of agriculture extension activities, and that market failure arising from externalities makes it essential for the public sector to assume increasing responsibility for this aspect of agriculture funding. Alston, Chan-Kang, Marra, Pardey, and Wyatt (2000) found no conclusive proof that a predominantly public sector driven model of financing agricultural research and extension has significant productivity or efficiency advantages over private sector funding models and vice versa. Rather short-term productivity gains in private sector

competitive grant financing system may be offset by longer-term social cost, as private industry is more preoccupied with the bottom line than in social welfare.

The notion of market distortion by strictly government intervention on the one hand, and vested corporate interest by private institutions makes it difficult to propose one model of financing over the other. Banerjee et al. (2014) suggested a collaborative pooling of funding sources but sharing of responsibilities among private, public, and donor institutions in a way that optimizes efficiency in the management of resources accruing to the agriculture sector from these different sources. Banerjee et al. observed that private sector funding of agriculture research in most developed countries is of interest driven by large farm owners and consumers. And those international donor agencies operate centralized structures that do not adequately reflect local needs and conditions concerning the projects they choose to finance. That most governments focus excessively on "getting the prices right or even getting the institutions right." (Banerjee et al. argued that these policies have failed to yield the desired results especially in the face of "chronic under-provision of public goods investments". The multiple-layer collaborative model proposed to take advantage of the financial capacity of international organizations; the management capacity of private corporations and the regulatory, as well as governance capacity of the state, are not well articulated.

The collaborative funding model is also attractive for the purpose of taking advantage of research and technology in agriculture intervention. For developing countries to enjoy the benefits of technology that is driven by local needs, Banerjee et al. (2014) endorsed a proposal by first, putting forward two previous studies (Hounkonnou

et al., 2012; Louwaars & de Boef, 2012). In the studies, the performance contract between donors and international seed companies to achieve specific outcomes such as developing improved maize varieties that are stress tolerant and yet high yielding and responsive to fertilizer (Louwaars & de Boef, 2012). The authors expect that collaborative models such as this one "may help refocus the priorities and energies of the private agricultural research industry, which currently do not have a commercial incentive to focus on small, low-income farmers with little effective demand" (Louwaars & de Boef, 2012). Hounkonnou et al. (2012) asserted that it is required on the part of the government to create institutions to provide effective governance and management such as ensuring demand elasticity for commodities "through market-facilitating public investments and policy choices" like trade policies and investment in support infrastructure (p.23). Infrastructure development has primarily been a traditional responsibility of government before Public Private Partnership models.

Apart from the need to share expertise, collaborative models are also necessitated by the limited budget for agriculture and the need to pool resources. Nkonya et al. (2012) proposed complementary funding models for agricultural projects to ensure sustainability of successes recorded by agricultural development projects targeted at poor and vulnerable populations. Nkonya et al. focused on donor-funded irrigation projects in Nigeria and concluded that donor agencies should collaborate with credit services providers to provide affordable credit to poor rural farmers to enable them to maintain productive asset acquisition in the long run. This recommendation is also extended to include collaboration with rural credit savings and loans associations in rural

communities where there exist and the creation of such institutions where they do not exist.

From the study on donor-funded irrigation projects, and other literature cited previously on collaborative funding/management of agriculture projects, emerge two key success criteria identified for short and long term benefits of such projects to targeted communities. First is the obvious implication that both the social development goals of governments and donor agencies and the market efficiency element of private credit institutions are required simultaneously to ensure favorable demographic targeting by agriculture programs. Secondly, it is suggestive of the need for some degree of local content in both the financial resource and organizational content of local institutions (beneficiary savings and loans associations) to ensure the success of donor-funded programs.

Ownership and Community Participation in Project Execution

Participation by local community beneficiaries in the conception, design, and implementation of community development projects emerges from the development literature as one of the key success criteria for success of development intervention programs. Bell, Morse, & Shah, (2012); Luyet, Schlaepfer, Parlange, & Buttler, (2012); and Ramos et al. (2014) are of the opinion that participatory methodology did not evolve in the first place as a concept of local agency involvement. But as a critical requirement for the appreciation of the underlying social and economic conditions that gave birth development intervention. Dahiya (2012) argued that knowledge of the social and geographic characteristics of poverty and inequality is necessary if effective policies and

programs are to be designed to reduce the both the incidence and impact of these conditions on affected communities. Dahiya (2012) studied poverty in 20 countries and concluded that the poor and disadvantaged "often live in remote rural areas; are more likely to be ethnic minorities; and have less education, fewer assets, and less access to markets" (p.107). These findings, about the fundamental argument that suggests the potential for effectiveness of any intervention program is unlikely enhanced by the old principle of a one-size-fits-all international development institution approach to social development policy.

In the agriculture sector, and especially in the case of international donor-funded projects, the literature on anthropology in development is replete with recommendations for the participatory model, not only in management but also in the ownership of development projects. Nkonya et al. (2012) believed that success is enhanced when funding organizations collaborate with rural credit savings and loans associations in rural communities where they exist and the creation of such institutions where they do not exist. From this and other literature cited previously on collaborative funding/management of agriculture projects, emerge two key success criteria identified for short and long term benefits of such projects to targeted communities.

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success of donor-funded programs. Dillon (2011) reported that "irrigation investment projects encourages households to save more and share more with their villages, which is a type of investment in informal social insurance" (p. 2173). This approach would suggest that the establishment and promotion of local savings and loans associations, rather than serving as a condition for success are the direct results of the existence of these projects. Apparently, the significance of this contradiction of the study conducted in Northern Mali has in its findings of the similar research fact like that of Dillon's findings in small-scale irrigation projects in the region.

Credit recovery through membership of local associations records a higher than average repayment success rate of loan repayments owing to the enforcement capacity of the organizations. Ike and Uzokwe (2012) offered proof that cooperative beneficiary associations serve as highly efficient enforcement mechanisms for loans repayment but also that flexible repayment conditions such as repayment in small, regular installments significantly enhance successful repayment of agricultural loans in rural communities. Matanmi et al. (2012) believed that cooperative credit societies by poultry farmers improve access to agricultural credit. In some cases, membership in these associations is a precondition for farmers to be able to obtain loans and grants from projects funds (Ango et al., 2012). Project success, in this case, is particularly enhanced by farmer's participation in the planning and execution of the programs through the farmers' association. Similar conclusions are contained in an earlier study carried out by (Croppenstedt et al., 2013). The role of community in the performance measurement of

agriculture credit schemes both in participation and access to credit by beneficiaries and also loans recovery rate is the key to success to the funding organization.

Management of Agricultural Funds in Developing Countries

Previous studies reviewed so far show that the problem of coordination is a major challenge to the success of agriculture funding programs by multiple funding agencies in Sub-Saharan Africa. Binswanger-Mkhize, Byerlee, McCalla, Morris, and Staatz (2011) offer strategies for ensuring that the objectives of stakeholders are in conformity with the goals of agriculture development in the region. In addition to the existing coordination procedures of the Rome and Paris Declarations, Binswanger-Mkhize et al. proposed that recipients should be responsible for ensuring compliance with national policies and that such compliance verified through ex-post audits. Binswanger-Mkhize et al. believed that these measures are essential to ensure that "both donors and recipients conform to national development and sector policies, strategies and plans" (p.7). National and sector policies are in themselves important determinants the volume of external financing that flows into developing countries.

The availability and accessibility of credit finance remain a critical challenge for agriculture in Sub-Saharan Africa. Diao et al. (2013) observed that the nature of the incentive which this type of funding, offers primarily to rural farmers remain vital to exploring ways through they employ credit financing as a useful tool for enhancing agricultural production in Africa. Hazell (2013) believed that part of the solution lies in providing agricultural incentives in the form of low-cost savings, which farmers can access without difficulties, such as postal savings and matching grants. Stressing the

assertion Ogar and Gabriel (2015) believed that such incentives should be made available not only for users of credit funds but also for providers of such funds through underwriting or guarantees. These incentives explain the measures that provide soft-landing for the banks and the farmers regarding cost and tenor so that credit may be useful as a means for enhancing agricultural productivity.

The State of Agriculture Financing in Nigeria

Although the focus of this section is to examine the state of funding for agriculture in Nigeria, the assessment incorporates background material that addresses the financial situation in sub-Saharan Africa. The evaluation provides the context for the subject of this section as well as identity shared experience in funding agriculture in the sub-region with relevance for policy recommendation on agriculture funding policy in Nigeria.

The agriculture financing market in Nigeria consists of both public and private institutions in addition to government support instruments and funds from abroad such as overseas development assistance. In their work, Obansa and Maduekwe (2013) classified agriculture-funding sources in Nigeria into national (government) budgetary allocations, grants by foreign governments and agencies and credit financing. To authenticate their findings, Ogar and Gabriel (2015) listed the sources of agriculture financing in Nigeria to include not only money deposit banks but also specialized institutions like Nigeria Agricultural Cooperative and Rural Development Bank (NACRDB) now bank of farming. However, Banerjee et al. (2014) observed that there is a significant gap between policy pronouncements by sub-Saharan Africa governments and real funding support for

agricultural activities in the region. The author's linked government funding programs directly to positive social change and poverty reduction. They noted that such programs did not increase disposable incomes of smallholder farmers only, but also reduces food prices for the urban and rural poor.

Agriculture financing in Nigeria, particularly credit financing by banks and other lending institutions, is inadequate to meet the funding requirements of the agriculture sector in Nigeria. On the demand side, Ogar and Gabriel (2015) contended that most rural farmers in Nigeria are smallholder farmers, and lack the capacity to maximize the use of bank loans and technical assistances prescribe for such borrowers with limited capacity. Most lenders in Nigeria are unwilling to get involved in providing such support due to the cost of credit appraisal. Watts (2013) contended that in northwest Nigeria, the population and spread of smallholder farmers across vast areas of rural communities makes it difficult to carry out effective monitoring of farming operations by credit granting institutions. In addition to the fact that farmers' literacy level in the area is inadequate for farmers to comprehend the procedures, terms and conditions of agricultural credit by money deposit institutions.

The literature on agriculture productivity recognized the role of the market-based mechanism in creating incentives for agriculture productivity. In their work, Binswanger-Mkhize et al. (2011) asserted that private funding (investment) of agriculture holds the greatest potential for social development and poverty reduction in Africa. Binswanger-Mkhize et al. do not offer an extensive discussion of the relative merits of private versus public funding of agriculture in Africa. On the other hand, Ogar and Gabriel (2015)

attempted an insight into the claim that private sources are most appropriate for sufficient funding for agriculture in Africa. Ogar and Gabriel observed that public financing and subsidies in the agricultural sector distorts the market and adversely affects economic growth. This distortion is due to countries in the West continue to provide the same kind of support for their farmers.

Using the market efficiency logic also strengthens the argument that investment in agriculture is also good for business as well as local interests. Binswanger-Mkhize et al. (2011) noted that vast opportunities exist in Africa for investors, funding agencies and other stakeholders to take advantage of technology and commercial agriculture through the international agribusiness network. Binswanger-Mkhize et al. observed that in the last decade since 2003, owing to the reduction in incidences of conflict and increased democratization in Sub-Saharan Africa, there has been an increase in the flow of funds from private funders and emerging economy donors in the form of international development assistance. However, the authors describe this situation as modest improvements in donor behavior. Binswanger-Mkhize et al. (2011) also observed that this increased funding is still inadequate to close the gap between Africa and the rest of the world and that actual funding has lagged behind the international commitment to provide funding support in the area of "climate-related mitigation and adaptation measures" in Africa (p.5). Mitigation and adaptation measures are currently operating in Nigeria's northeast through the Fadama irrigation projects.

An examination of the state of agriculture financing in Nigeria is provided in the next section. The four primary funding sources summarize the analysis namely, public

(government) sector, credit financing, international development assistance, and foreign direct investment.

Public Sector Funding of Agriculture

Government commitment to funding agriculture occupies a very prominent place in the debate on agricultural financing in Nigeria. As an element of national social and economic policy, finance activities have been carried out through statutory allocations to the agriculture sector and through special purpose vehicles that have been set up by successive political administrations to address particular problems or to develop the industry as a whole. As a statutory requirement, the responsibility for funding agriculture falls within the concurrent list of the country's constitution (Nigeria, 1999). It implies that both governments at the national and sub-national levels are required to provide funding for the agriculture through the ministries (at the federal and state government level) and departments (at the local government level) of farming.

The limited funding for agriculture intervention projects by international development institutions is reflected in small allocation to agriculture in the national budget. Mogues and Benin (2012) evaluate the financial commitment of the government to the agriculture sector. They found that between 2001 and 2005, the entire public expenditure on agriculture was less than 5% of total government spending (Ita, Ukpong & Ekpebu, 2013). The analysis showed that on a sectorial basis, budgeted expenditure on agriculture lagged behind allocations to water, health and education sectors respectively.

The level of funding indicates a lack of consistency between policy objectives and budget allocation. Mogues and Benin (2012) contended that this low level of financing

contrast sharply with the importance of the sector to the economy and government's policy statements on agriculture funding and African continent's benchmark that prescribes at least 10% of annual public spending on agriculture. Inadequate spending by Nigeria's federal government is further compounded by stark lop-sidedness in the overall allocation of funds to agricultural programs and projects. Less than 2% of total projects financed by the government, according to the authors, account for 81% of entire public expenditure on projects. Even then, about 75% of disbursements are committed to the purchase of inputs or agricultural outputs. Apart from highlighting the shortcomings in the disbursement and management of funds by Nigeria's national government in the agriculture sector, the point about lop-sidedness in the expenditure of funds across programs raises the pertinent question of the extent of government's involvement in the final utilization of funds meant for the agriculture sector.

Apart from the magnitude of funds allocate for agriculture purposes, the manner of government involvement also raises questions about government's positive contribution to the funding of farming. Taking the arguments of Alam, Buysse, Begum, Wailes, and Van Huylenbroeck (2011) into consideration, significant efficiency gaps may arise from government's involvement in the business end of agriculture financing activity such as input and output purchasing.

The current inadequate funding of agriculture in the national budget is not the only challenge associated with agriculture funding. Researchers have also raised questions about the efficiency of allocation of financial resources. Mogues and Benin (2012) did not expressly raise the efficiency question about the involvement of the

government in such activity as the purchase of inputs, but they argued that government's action in allocating funds among various programs and projects fails to meet required standards of allocative efficiency. Specifically, they observed that various presidential initiatives in agriculture, which differed markedly regarding crop type and technology, nevertheless receive equal amounts of money allocated to them. It all boarded to down to insufficient needs assessment and costing by government agencies responsible for this function. This conclusion is also significant with findings of previous studies (Mogues, 2015; Porter et al., 2012), which attributed such suboptimal allocation of funds by public sector institutions in the agriculture sector to political considerations rather than economic factors. This observation is relevant as a possible explanatory variable for the performance of projects funded by the government in northeast Nigeria.

In addition to small budget allocation and the problem of allocative efficiency, a third factor is the poor implementation of the overall national budget. Mogues (2015) also observed that low level of application of the agriculture budget is a major hindrance to agricultural productivity in Nigeria. However, to Mogues admitted that the problem of limited budget implementation is not unique to the agriculture sector, it is a major challenge associated with public sector budgeting in Nigeria. Results of their investigation showed that, during the period covered by the study (2001-2005), the portion of unimplemented budget ranges between 21% and 56% for the federal and state governments respectively. The poor implementation of the national budget affects actual expenditure on agriculture projects to the extent that public agriculture spending is slight preference.

Similar conclusions appear to reinforce the link between inadequate public sector funding and agricultural productivity in Nigeria. Mogues and Benin (2012) established a direct positive relationship between government spending on agriculture and total agricultural output. Using a multiple factor analysis, they found that the direct correlation between government spending and agricultural productivity constitute the most significant factor compared with both indirect and other lag factors. This conclusion is consistent with previous observations that government expenditures on agriculture have the potential to shift the production frontier upwards as in the case of irrigation projects.

An improvement in efficiency, even without an increase in the volume of funds, leads to the significantly improved performance of agriculture projects. Alpuerto, Diao, Salau, and Nwafor (2009) measured the elasticity of such shift in agricultural productivity due to government spending and concluded that given current efficiency levels, agricultural spending would have to increase by 23.9% between 2009 and 2017 to generate a productivity growth of 9.5% in agricultural output. Alpuerto et al. extrapolated that by raising the efficiency level of public agricultural spending in Nigeria to levels projected for Sub-Saharan Africa, public sector spending would require being increased to a lower level (13.6%) to generate the same degree of growth in agricultural productivity (9.5%). Thus, this study makes the arguments for both increasing the quantity and quality of agricultural spending in Nigeria to attain the desired levels of agricultural productivity.

The performance of intervention projects is not subject to the location of the region in the country. Mogues (2015) observed that public spending on agriculture in

Nigeria is at lower levels than required; he added, "publicly supported agricultural interventions in Nigeria have had variation but positive impacts" (p.62). The case for targeted intervention programs in the agricultural sector stands in marked contrast to the point, also made in the study that governments funding activities in the area has failed to achieve optimal allocation of resources across projects and geographic locations. The study also suggests that successes recorded by government's intervention in the agricultural sector confine to ADPs, particularly the Fadama irrigation projects. Project performance is, therefore, subject to project type rather than project location.

A macroeconomic level of analysis sheds only little light on the impact of agricultural intervention projects. Ita, Ukpong, and Ekpebu (2013) reported different conclusions on the effects of government spending in the agricultural sector in Nigeria. In this case, Ita et al. focused on the overall impact of public agricultural expenditure on the economy. This relationship was found to be positive but insignificant. Ita et al. believe that the level of significance of this result was due more to the small level of funding by the Nigerian government in agriculture than in the capacity of agriculture to generate positive economic gains. The argument for the impact of public expenditure pattern rather than absolute values of the expenses on agricultural output was further strengthened by Ita et al. who posit that volatility in government spending has a differentiated effect among countries. While the impact on production in developed countries was not found to be significant Afonso and Jalles (2012) studied the effects of spending volatility and deemed it harmful for output and growth in developing countries. Mogues and Benin (2012) drew a direct relationship between public expenditure on

agriculture and production growth, noting as well that irregular pattern in public sector funding for agriculture in Nigeria continues to reduce the impact of such spending. The conclusion strengthens the growing consensus that the level and mode of government expenditure has as much impact on intervention projects as the way that the projects are structured.

Case studies on individual projects funded and administered by the government in Nigeria appear to show a more positive result regarding performance and impact of targeted populations. In supporting their findings, Umar and Abba (2012) conducted an impact assessment of the ADP on farmers in northeastern Nigeria and concluded that the project has a net positive effect on output, income, credit access, asset acquisition, and extension services. The same project was found not to have produced a statistically significant impact regarding farm size, innovation in technology and rural infrastructure. However, the state of rural infrastructure, while it is integral to the ultimate effects of the increase in output concerning market access, is not addressed by the ADPs regarding the design of the program.

ADP projects reviews replicate the performance in crop cultivation and poultry production. Matanmi et al. (2012) conducted an assessment of the veterinary extension service component of the ADP. They reveal that the project provides only limited veterinary services to farmers in Kwara State in north-central Nigeria. However, the services have had an impact on the volume of poultry production in the region. Okoedo-Okojie and Orhiakhi (2012) observed the limitation of implementation of the project extension services to Southern Nigeria by the level of education and farmer experience.

Okoedo-Okojie and Orhiakhi referred specifically to poultry farming in Edo State region. These results are limited in scope considering that scale of poultry production is not extensive enough to produce insight into the impact of the intervention program on poor communities in Nigeria.

The overall preliminary analysis exposes significant shortcomings with the state of government financing of agriculture. Gabre-Madhin and Haggblade (2004) observed strong government's political commitment to agriculture funding projects in developed countries; African governments do not exhibit the same level of consistency in their commitment to financing agriculture. African farmers on their part lack the capacity to influence this commitment, as they do not have a loud voice enough to change government policies.

Credit Financing of Agriculture in Nigeria

Analysis of the literature on agriculture credit financing shows that the state of credit financing does not differ significantly from government commitment to agriculture funding. Alkire & Seth (2015) identify credit as an important instrument for helping both agrarians, and non-agrarian low-income populations meet to short-term income shortfalls. However, Nkamnebe and Idemobi (2011) observed that credit financing in Nigeria suffers mainly from poor credit administration, especially credit funds administered by agricultural credit guarantee institutions. Smallholder farmers, who constitute the bulk of participants in the sector, encounter severe difficulty in accessing credit for their operations. Apart from the fact that agricultural credit is usually not channeled to this category of farmers who suffer from real liquidity constraints, the loans are short-termed,

which imposes additional restrictions on small-scale farmers primarily to repay them. Nkamnebe and Idemobi (2011) identify inflationary considerations as well as inferior collateral status as exogenous factors responsible for the short tenure of agricultural credits in Nigeria. However, the study contended that the impact of tenure on the effectiveness of agricultural credit is also dependent on the type of agricultural activity.

In the same way, that the limited amount allocated to agriculture in the government budget utilization is not optimal for the achieving maximum results. Credit financing faces structural, supply-side issues as well as the capacity of beneficiaries to apply funds efficiently. In a study, which covered loans for livestock production, Nkamnebe and Idemobi (2011) observed that loans to Nigerian farmers for beef fattening had shorter repayment periods than the average fattening period. Borrowers also used the funds to increase herd size and quantity of feedstock rather than improve the quality of feedstock and management techniques. Nkamnebe and Idemobi (2011) concluded that the effectiveness of such loans was limited severely by the failure of agriculture credit institutions, particularly the Nigerian Agricultural and Cooperative Bank (NACB), now Bank of Agriculture (BOA) to exploit the complementarities between investment in new technology and increased liquidity. These conclusions reflect in the works of World Bank Group (2012) who focused on credit obtained for the purpose of crop production. This argument implies that financial institutions are either expected to prioritized investment in relevant technology or collaborate with other technology promoting organizations to maximize agriculture loans performance.

The above factors relating to tenure of credit constitute only a part of the problem associated with the effectiveness of agriculture loans administration in Nigeria. Repayment of agricultural credit by farmers is also a major issue related to agricultural credit administration in Nigeria (Mustapha, 2011; Nkamnebe and Idemobi, 2011). Both researchers identified attitudinal factors as key contributors to the poor performance of agricultural credit programs. These conclusions relate mostly to agricultural credit programs administered by government agricultural credit institutions. The Beneficiaries' perception about the loans stems from the erroneous assumption that grants from the government is part of recipient's 'share' of national resources.

To apply the resolving supply technical or coordination problems do not, however, lead to the optimal application of agricultural credit by beneficiaries. Ojiako and Ogbukwa (2012) measured the production efficiency of loans granted to food crop farmers by the Bank of Agriculture in southwestern Nigeria. They showed significant evidence of agriculture credit abuse by beneficiaries and suboptimal management of resources by farmers. Although credit is made available to the farmers by the bank, much of what the farmers receive are diverted to other uses other than the purposes for which they need the credit. The portion of agriculture credit utilized for food crop cultivation shows a significant gap in technical efficiency, wider gap in allocative efficiency and the largest gap in economic efficiency. Ojiako and Ogbukwa (2012) conducted further diagnosis on the sources of these inefficiencies. The study finds that levels of inefficiencies are directly proportional to the amount of hired labor and volume of fertilizer use. Exogenous factors included age, education and marital status of beneficiary

farmers. The multiplicity of endogenous factors, especially resource misapplication makes it difficult to measure the actual productivity of agriculture credit by the Bank of Agriculture. The influence of other factors like education and family size means that it becomes necessary to compare results across social-cultural communities to assess the underlying efficiency parameter uniquely identifiable with loans from the bank and other agriculture credit institutions.

Agricultural credit conditionality and enforcement mechanism both potentially and enhances the incentive for beneficiaries to apply for credit more efficiently. Ike and Uzokwe (2012) reported that the rate of return on labor in a UNDP-funded microcredit program in southern Nigeria to be higher than the existing market rate for such operations. Ike and Uzokwe also found the rate of farmers' return on borrowed funds is greater than the interest charged on the loans. The top rate of loan repayment for the micro-credit scheme, however, attributes its success to factors extraneous to the economic performance of the funds. The funding agencies divide the beneficiaries of the funds into community-based social groups, which exercise collective peer group pressure on recipients to both regular repayment schedule and compulsory savings, which serve as insurance against future financial crisis. Compensation requirement is also stipulated in small, manageable and periodic installments to enhance ease of repayments. Ultimately, the combination of both factors (peer beneficiary pressure and flexible repayment conditions) implies a classic carrot and stick credit administration model within demographic constituencies where agricultural credit systems are still largely underdeveloped.

International Development Funding for Agriculture in Nigeria

Previous discussions on government and credit financing of agriculture intervention projects indicate that both categories of funding do not necessarily exclude international development assistance. However, a separate analysis of the financial contribution of international agencies is necessary to establish the level of contribution of international development institutions to agriculture projects in Nigeria. Gabbre-Madhin and Haggblade (2004) noted that political commitment by donors to financing agriculture in Africa is currently fragile, as "schizophrenic donor policies collide and constrain African farmers" (p.761). Gabbre-Madhin and Haggblade laid out aggregate figures, which show graphically that support for African farmers by OECD countries is only a sixth of the total funding support made to farmers in OECD countries. This support of financing goes to OECD farmers as subsidies, which ultimately have the detrimental effect of almost $2 billion in lost income to African farmers (Diao et al., 2013).). Gabbre-Madhin and Haggblade further showed that half of the figure for lost income is deployed by aid agencies to African farmers only. The literature suggests that given the appropriate level of political will from the donor community, African farmers possess the capacity to respond positively and generate successes in the continent's agriculture sector.

Donor support for agriculture in developing countries has lagged behind financial requirements for the industry particularly regarding donor approach to agriculture intervention projects. This problem was identified in the 1980s in work of Binswinger-Mkhize and McCalla (2012) as representing the height of donor support for farming. But, even during this peak era, foreign aid to agriculture was not only poorly designed, but it

was also still "insufficient to compensate for these detrimental policies and lack of domestic resources" (p. 7). The donor environment characterized by weak donor specialization and coordination hardly fulfilled their funding commitments.

Webb and Block (2012) further shows examples of what they considered as the wrong approach by donors to financing intervention programs mainly directed at addressing poverty and inequalities. Morfit (2011) measured the level of donor funding of agriculture in Africa using the availability of NGOs' job opportunities in 12 sectors over a period of 20 years and found that the numbers for the agriculture sector declined progressively to about 4% in 2005. This reduction has failed to match population growth in developing countries over the same period.

Researchers who examine specific projects operates with funds from donor institutions do not share these findings. Regarding project performance, Gabbre-Madhin and Haggblade (2004) conducted an impact study on Fadama projects in 12 states in northern Nigeria. The result of their findings shows significant impact on production growth and increased farmer income. In equal terms, Jumoke (2012) measure increase in farm income and found that the Fadama project implemented in southwestern Nigeria led to rising in farm income by threefold. Ezihe, Oboh, and Hyande (2014) study the impact on the same World Bank funded a program in the relatively less poor North Central Nigeria and reported similarly that the project had a significant effect on output, income and labor use. Coupled with a corresponding increase in the level of asset acquisition Jumoke (2012) found a net positive impact on the overall welfare of farmers who

benefited from the program. This net positive effect is only significant to the extent that the size of the beneficiary population is sufficient to create a community-wide impact.

Donor funded projects whose size, scope and area of coverage are significant about the scale of the recipient community have therefore had a substantial effect on the communities. Nkonya et al. (2012) carried out the same study on the Fadama project described as "the largest agricultural project in Nigeria" (p.1835) and find that the project had a substantial positive income effect on beneficiaries. This study was extended to cover equity criteria including the project ability to benefit the poorest farmers and disadvantaged groups. Nkonya et al. find that the program was successful in achieving valuable asset acquisition for poor, particularly women, farmers through its large subsidy component. However, the authors also note that the project, like most community development donor-funded agriculture programs performs poorly regarding sustainability. The results of the study also show that the programs were not sustainable as they lacked rural credit services.

Innovations in technology, however, have a different impact on the performance of intervention programs. Some of the successes identified with the Fadama projects in northern Nigeria relate to the way in which the irrigation projects enhance the cultivation of larger sizes of land than are cultivable under previously exclusive rain-fed farming systems (Jumoke, 2012; Simonyan & Omolehin, 2012). Chikerenma (2015) showed that the same irrigation program in the southern sector of the country also results in increased farm sizes, an increase that is observable in both the physical size of agricultural plots and multiple plots cultivated. While the increased land cultivation due to irrigation

projects does not provide a clear measurement of performance regarding productivity (i.e. ratio of output to input, or crop yield per hectare), the increase nevertheless indicates significant expansion of agricultural activity due to funded irrigation projects.

The local potential that exists within beneficiary communities before the moment of intervention is likely to determine the success or failure of the intervention projects. Dillon (2011) Dillon's, whose study was carried out on small-scale irrigation projects in Mali, showed that these projects result in significant increase in production and consumption in communities with pre-existing agriculture potentials. Review the previous literature provides readers of the international donor agencies for undertaking another perspective that raises relevant questions about the successes attributed to the intervention funding.

Foreign Direct Investment

The extent of foreign direct investment in agriculture in Nigeria is largely dependent on fiscal and monetary policy indicators. Ajuwon and Ogwumike (2013) establish a significant positive relationship between foreign direct investment in the agricultural sector and agricultural productivity in the short and long run. However, the magnitude and pattern of foreign investment are dependent on the level of lending, exchange, and inflation rates. Nmadu, Eze, and Jirgi, (2012) found an equally significant link between personal investment by local farmers and agricultural productivity. But like the external component of private agricultural investment, personal investment by local farmers is often limited by the perception of risk factors associated with farming operations. Farming operations in rural Nigeria consist mainly of rain-fed agricultural

cultivation and other traditional practices like the use of traditional farming tools. They tend to increase risk premium on agricultural investment in Nigeria. Nmadu et al. argued that risks associated with agricultural activities in Nigeria are of the kind that requires reasonable investment in requisite technology typically designed to modernize operations and mitigate effects of natural conditions in agriculture. The relationship between risk and personal investment, when analyzed regarding technology, is one that gives rise to a vicious cycle of the presence of risk due to natural factors, the absence of investment in risk-mitigating technology due to farmers' risk aversion, and the perpetuation of risk due to constrained investment in technology.

The evidence linking technology to the performance of FDI becomes tenuous when introducing the human factor into the analysis. Ogundari et al. (2012) suggested that the technology factor might not be as significant about the absence/presence of other critical factors. In a review of Nigeria's agricultural efficiency literature compiled over a period of 12 years, they showed that level of education of farmers by far outweigh other factors as a determinant of effectiveness. The study concluded that current efficiency gap in Nigeria's agriculture could be eliminated by significant investment in human capital, even without significant improvement in the level of technology.

Conclusion

The review of educational material for this study focuses on discussions that attempt to measure the degree and productivity of agricultural funding projects in Nigeria. The analysis also included background material on the history and logic of development interventions to situate this study within the particular context of financing

of agriculture for the purpose of economic and social development. The review exercise proceeded to examine existing empirical studies carried out on specific agricultural funding projects in Nigeria, first to explore the existence of a general pattern in productivity of different types of agriculture funding programs, and to identify specific indicators of ‘success' of agricultural projects implemented by them within targeted beneficiary communities.

The literature review included the identification of the main measurable parameters that include income generation and assets acquisition. The relevant funding sources classified broadly into government budgets, official development assistance, and credit-based agriculture funding programs. This review of previous studies showed that existing academic work on agricultural financing in Nigeria attempted useful generalizations on project performance based on the type of project but not on the kind of funding. The study proceeds to undertake an empirical analysis of existing data on agriculture project performance in Nigeria based on sources of financing to identify any general pattern that exists with regards to the impact of funding source on the degree of success. I also explored underlying factors that explain variations in project performance regarding the parameters defined above. This approach is useful for identifying options for optimal utilization of limited resources available for agricultural projects designed to reduce poverty among poor rural populations, and thereby maximize the social change impact of such projects.

Summary and Transition

The literature review began with the discussion of the historical and theoretical issues surrounding social intervention programs in developing countries, and subsequently focused on the programs designed specifically for funding agriculture in Nigeria. In reviewing the existing studies on agricultural funding through intervention programs, it was revealed that some small-scale irrigation projects perform more efficiently that large scale one. Most research in the works of the literature showed that programs with active local community participation in the conception and implementation record higher probability of success than programs with less input from the communities. I then focused on the different types and sources through which funds have been channeled to finance agriculture projects aimed at improving the welfare of beneficiaries. I reviewed previous empirical studies carried out to measure the performance of agricultural programs regarding output and possible impact. The chapter concluded with a brief proposal, emerging from the literature, on better funding for agricultural projects in Nigeria. In testing the central assumptions contained in the previous Chapters of One and Two, the preceding chapters includes an analysis of available empirical data generated from the field assessment of selected individual projects to measure the impact and outcome on beneficiary communities.

Finally, the review also revealed that agricultural credit programs perform best-concerning loans repayment where beneficiaries and members of local farmers' associations who are partly involved in the disbursement and recovery. However, none of the studies reviewed showed a definite pattern of performance based on the source of

funding. From the research work, however, it clearly shows that there is a link between funding source and project performance using Ordinary Least Squares method to test the relationship between funds provided for agriculture by the various sources and the effectiveness of the respective intervention programs.

Chapter 3: Research Method

The purpose of this quantitative ex- post facto study is to explore the application of the first best resource allocation theory as a framework for enhancing the understanding of the impact of the various sources of agricultural funds on community development. For the purpose of the study, community development is measured in term of income levels, poverty alleviation, assets acquisition, and agricultural outputs. To establish the net effect of agricultural funding in beneficiary communities, I introduced control variables such as inflation rate, government expenditure, and the level of technology and climate change that could also influence community development indicators. The participants are the beneficiaries of the agricultural funds in Yobe State, Nigeria.

The independent variable is the agricultural funding from various sources such as the Fadama III, NPFS, and IFAD/CBARDP. The dependent variables are the assets acquisition proxied by changes in the net worth of the beneficiaries and income level proxied by the non-discounted cash flow of the recipients, poverty level by income per capita and productivity by total agricultural output. The control variables mainly include inflation rate proxied by changes in consumer price index and climate change, which is a dummy that takes the value of 1 if the weather is favorable, and 0 if the weather is unfavorable. Government expenditure is proxied by total Yobe State government spending on agriculture, and level of technology, which is a dummy variable that takes the value of 1 if the beneficiaries use modern farming equipment and zero if they use traditional equipment. Others are exchange rate, which is the naira value per unit of

foreign currency in a grant. It takes the value of 1 if the exchange rate is favorable and the value of zero if the exchange rate is unfavorable. The level of corruption is defined by the existence of monopoly and discretion without accountability.

The outline of the rest of the chapter follows this pattern. I identified the study variables and explained the design in the Research Design and Rationale section. I also explained the choice of design and its relationship to the overall design type used for conducting impact studies. The methodology of the research was described regarding the population, sampling and instruments for collection of data. The method precedes a description of the instrument selected for collecting data from the field. Following the instrumentation description, I outlined in detail the plan for the analysis of data including the software used, model specification procedure for testing the hypothesis and the statistical decision criteria. I devoted the next section to the discussion of internal and external validity as well as strategies to mitigate threats to validity. The last item in the chapter addresses ethical issues associated with the study and the plans for addressing ethical concerns. I ended the chapter with a brief summary and transition statement to Chapter four.

Research Design and Rationale

Consistent with studies on the effectiveness of agricultural funding sources, the identification of robust dependent and independent variables is very essential. Given this requirement, I adopted the multiple regression approaches to estimate the hypotheses formulated for the study. Specifically, funding sources from the Fadama III, NPFS, and IFAD/ CBARDP was adopted as the independent variables. The dependent variables are

the assets acquisition proxied by changes in the net worth of the beneficiaries, income proxied by the non-discounted cash flow of the recipients, poverty level proxied by income per capita and productivity proxied by total agricultural output.

Other variables that could influence the dependent variables include inflation rate proxied by changes in consumer price index and climate change, which is a dummy that takes the value of 1 if the weather is favorable, and 0 if the weather is unfavorable. Government expenditure which is proxied by total Yobe State government spending on agriculture, and level of technology which is a dummy variable that takes the value of 1 if the beneficiaries used modern farming equipment and zero if they use ancient farm tools entered the models as control variables.

This study focuses on the impact of agricultural funding sources on poverty reduction and income inequality of beneficiaries in Yobe State. In achieving this objective, I adopted the ex-post facto research design. The decision to utilize the ex-post facto research design is because I relied extensively on historical data that already exist. Thus, I separated the independent variable (the intervention funds), and the dependent variables (asset acquisition, income, poverty, and output) in time. The choice of research design was needed to address the research questions, which deal with the determination of the outcomes, which the funding agencies expect to achieve only after the implementation of the agriculture intervention programs. The first research question attempts to measure changes in income and poverty directly traceable to the programs that had already been carried out before the conduct of this study. Similarly, the determination of an appropriate governing system for intervention programs was strictly

based on the comparisons made between the different projects. The level of impact on poverty and income was the primary basis for this comparison. The purpose is thus explanatory in nature. Any reference to literature or theory of governance systems was made only as a means of understanding the nomenclature and design of governance structures for the purpose of making the recommendation for academic and policy purposes. The resolution of the last research question relied on the respondents' inputs, which are based strictly on past experiences from the implementation of the specific programs selected for this study.

Given the design choice, it would have been most appropriate to cover the entire population in Yobe State, to carry out an exhaustive assessment of the impact of the programs on income and poverty at the household level. However, this was not feasible given that it requires enormous capital outlay and a significant amount of time and resources. Thus, finance and time impose severe constraints to this study. Additionally, the issue of insurgency currently ravaging the state has made it practically impossible to assess some communities. These problems are heightened by the fact that some beneficiary communities are currently in Internally Displaced People's homes (IDPs) because of the activities of insurgents in those communities.

Ex-post facto research design involves events that have already taken place since. Time-series data maximizes the information included in the analysis (Babbie, 2014). Similarly, Montgomery, Jennings, and Kulahci (2015) opined that time series analysis adjust for the standard errors accordingly and extremely useful for conducting an array of sensitivity checks and analysis, and deals with simultaneity bias. In the same vein

Montgomery et al. showed that time series analysis improves information and sensitivity of data by detecting the direction of movement during the period under study.

Methodology

I outlined the particular strategy for carrying out this quantitative ex post facto study in detail in the following sections.

Population

One important aspect of empirical research is the ability to isolate the elements of observation. That is, identifying the part of the population (sample) that is of interest to the research from a dataset of all conceivable (or hypothetically) possible observation (population). The sample frame of the study consists of all the beneficiaries of the Fadama III, NPFS, and IFAD/CBARDP in Yobe. The target population of recipients of agriculture intervention projects comprises of about 1,099,908 beneficiaries spread across the three senatorial zones in Yobe State.

Sampling and Sampling Procedure

For the purpose this research work, I adopted the purposive sampling procedure in selecting respondents from the beneficiary communities identified for the study. As it is, the purposive sampling method is preferred because it combines both the features of randomness and practicability of application (see Babbie 2016). The purposive sampling is also well suited for the study as beneficiary communities are clearly defined with a finite list of participants contained in a sample frame. The purposive sample is also most appropriate for this study, as the sample is drawn from the database of beneficiaries of the

intervention programs, which the researcher obtained from the funding agencies namely Fadama III, NPFS, and IFAD/CBARDP.

The sampling frame consisted of a composite list of beneficiaries from all funded programs. I excluded all those who no longer reside in the communities. Conversely, all recipients who are still resident in the communities of first participation in the programs are included.

Before the selection of respondents, the judgmental or purposive procedure was used to identify communities in Yobe State selected for this study. This method allows the researchers to exclude communities that are not assessable due to the heightened state of insurgency in the northeast. Nine communities judgmentally selected from the three geopolitical zones in the state. The breakdown of the regions and localities is as follows: Yobe-East comprising of Damaturu, Tarmuwa, and Guba; Yobe-West consisting of Fika, Gadana and Chana; and Yobe-North comprising of Nguru, Amshi, and Karasuwa, representing three communities from each zone of the state. I included all the communities that benefitted from the funds at the pilot project stage in the observation. I also excluded from the target population all those communities that did not receive project funds for that stage.

The effective size of the sample frame is all beneficiaries of the funds in the selected communities. The sampling procedure involves collecting the names and contact addresses of the entire recipients from the Yobe State Ministry of Agriculture zonal offices of the program with strict adherence to ethical concern. However, the findings from this result may face a threat of external validity, which is a major limitation of the

purposive sampling procedure. I explained the strategy for mitigating this risk in the appropriate section of this proposal.

Sample Size Determination

The population of the beneficiaries of the agricultural funding programs is approximately 1,099,908 spread as follows: - Community-Based Agricultural and Rural Development Program (CBARDP)/International Funds for Agricultural Development (IFAD) 1,057,472, National Program on Food Security (NPFS) 18,756, and National Fadama Development Project 23,680. Since it was impossible for the researcher to reach the entire population, the Taro Yamane formula was used to determine the sample size. The formula is given as:

$$n = \frac{N}{1 + N\,(e)^2}$$

Where,

n = Sample

N = Population = 1,099,908

e = error of tolerance (at 95% Confidence level)

1 = statistical constant

$$n = \frac{1{,}099{,}908}{1 + 1{,}099{,}908(0.05)^2}$$

$$n = \frac{1{,}099{,}908}{1 + 2{,}749.77}$$

$$n = \frac{1{,}099{,}908}{2{,}750.77}$$

$$n = 400$$

According to Stokes (2014) the larger the sample size, the more representative the population and more reliable and valid the results. Since the sample size of Four hundred (400) is small for this type of study and in line with Israel (1992) suggestion that 10% (40 copies) was added to the sample size, we include the 10% to increase the coverage. Again, Stokes suggested the addition of 30% (120 copies) to take care of non-respondents. This sampling technique ensures that the desired levels of confidence, precision and validity are attained (Israel, 1992). Therefore, the total sample size for the study is shown below.

Using Taro Yamane Formula	n	= 400
10% to take care of inaccessible respondents		= 40
30% to take care of non-responses		= 120
Sample size of the study		= 560

Therefore, the total sample size for this study is five hundred and forty-nine (560) respondents.

Sources of Data

The literature shows that agricultural funding sources have significant implications for substantial saving which constitutes an exact measure of welfare changes in asset-base, agricultural output, income per capita and household income over the time interval if the resource allocation is first best (Arrow et al. 2012; Hamilton, 2014). It is imperative to adopt measures that are consistent with the First-Best Resource Allocation, that is welfare change along the first-best optimal, which have direct theoretical and empirical link between funding sources and objectives. This approach is necessary to

examine the impact of sources of agricultural financing on poverty reduction and income inequality.

I collated the data for the study of the beneficiaries of the Fadama III, NPFS, and the IFAD/CBARDP using a questionnaire. The data comprises assets acquisition, non-discounted cash flow, rural gross domestic product, agricultural output of beneficiaries, consumer price index, climate change, Yobe State total government expenditure, and level of sophistication of farm implements.

Archival Data

The economic data that would form the control variables include the standard of living, the exchange rate, inflation, and government expenditure. The Central Bank of Nigeria (CBN) Statistical Database holds the information on Consumer Price Index and the rate of exchange. The database provides a very rich source of economic indices and statistics for both the public and private sectors. The CBN statistics are collected using the Government Finance Statistics Manual prepared by the International Monetary Fund (IMF). The Central Bank collects the data through yearly and half-yearly fiscal surveys across the 36 states of the Nigerian federation as well as the federal capital. I collected other data at the central government level at the Federal Ministry of Finance and the Office of the Accountant-General (Nigeria 2016). I then sourced data on the standard of living from the National Bureau of Statistics (NBS). The NBS generates its data through annual censuses and surveys conducted by the Bureau.

Letters of request to access archival data were written to the Central Bank of Nigeria's Research and Statistic Department and the National Bureau of Statistics

respectively, seeking permission to obtain and use data for the study. I clearly specify the purpose for which the information is required, with appropriate assurances as the exclusive use of data. I wrote similar letters to the management of the Fadama III, NPFS, and IFAD/ CBARDP programs with necessary guarantees of purpose and exclusive use of data. Formal approval of request indicates informed consent for the use of data.

Instrumentation

The primary research instrument that I used for this study is the Community (Economic Group) Survey Questionnaire. The questionnaire attempts to measure the primary dependent variables, which are asset acquisition, income, and output of beneficiary (treatment group) and non-beneficiaries (non-treated group) of the Fadama III, NPFS, and the CBARDP/IFAD programs. I structured the questionnaire in a manner that allows for the collation of time series data for the period: 2009 – 2014.

I included at least one check question for each category of items associated with each dependent variable that I measured. This procedure is to ensure the reliability of research instrument. I formulated these questions as alternative forms of each of the four items identified for the test. The soundness of the Community (Economic Group) Survey Questionnaire was determined based on the cumulative tally of the check-questions completed by all the respondents.

I ascertained the validity of the questionnaire by comparing all performance criteria for effectiveness of agriculture intervention funds identified in the literature on agriculture intervention program in north-east Nigeria with items on Monitoring and Evaluation questionnaire developed by funding agencies in the north east. I further

compared the indicators identified with the ones I had previously observed from my interactions in the northeast as indices of poverty in the region. I then selected the measurement indicators that are consistent across these frames of reference.

The research instrument is sufficient to answer the research questions as all indicators identified as standard determinants of poverty and governance systems were listed, each one as an exclusive item on the questionnaire. Closed options questions at the end of the survey instrument are included to address Research Question 3, which I framed to enable me identify other causal factors which may be necessary as explanatory variables but which I did not capture in the itemized questionnaire list.

Table 1

Summary of Operational Definition of Research Variables

Name of Variables	**Notations**	**Operational Definitions**	**Proxies**
Standard of Living Poverty Level	STDL	Ratio of gross domestic product to total population (income per capita)	*Income per capita*
Agricultural Funding Sources	AGRF	Natural Log of Total Agricultural Fund from the Respective Sources	*LogAGRF*
Asset-Base	AB	Natural log of non-discounted cash flow of beneficiaries	*LogAB*

Income Level	Income	Natural log of Income of the beneficiaries	*LogIncome*
Agricultural Output	AGO	Natural log of Agricultural Output	*LogAGO*
Climate Change	CC	Conditional or dummy variable that take the value of 1 if climate is favorable to agriculture and 0 if otherwise	*Favorable 1* *Unfavorable 0*
Government Expenditure	GOVEXP	Natural log of Government Expenditure	*LogGOVEXP*
Inflation Rate	IFR	Consumer Price Index	*CPI*
Level of Technology	TECH	Conditional or dummy variable that take the value of 1 if beneficiary use modern farm equipment and 0 if otherwise	*Modern Equipment 1* *Ancient Implement 0*
Corruption	Corrupt	Monopoly + Discretion – Accountability which measures how funds are subverted in the programs.	*M+D-C*
Exchange Rate	EXCHRT	Naira value per unit of foreign currency in grant.	*Favorable 1* *Unfavorable 0*

Defination of Research Variables

Standard of Living: Poverty Level is measured by dividing the naira (N) value of the value of the total goods and services produced in Yobe State by the population of the state. The resultant value, expressed in naira, is the per capita income, which denotes the living standard of citizens of a state.

Agricultural Funding Sources is the Naira (N) value of the budgeted funds or other resources allocated to beneficiary communities, either through community farmers associations or directly to individuals to enhance agricultural production. For the purpose of this study, the natural log of the fund's values is taken to denote the rate of change in funding from the time of the baseline measurement to the moment of project impact.

Asset-Base is the non-discounted cash flows to beneficiaries from the baseline to the period of measuring impact arising from the implementation of funding project. The natural logarithm of non-discounted cash flow is used to compare the rate of change in asset base to the rate of change in the unit of intervention funding allocated to a community of beneficiaries.

Income Level: The income level measured in naira (N) is the monthly cash flows arising from farming activities either through the sale of agricultural produce or payment for farm labor. It takes the value of the disposable income, which is obtainable by deducting all the cost and expenses of the revenue. The natural logarithm is used to determine the rate of change of income over time from the baseline period income is measured by the term impact is measured. The statistical tests are used to determine

efficiency, that is, to compare the rate of change in the outcome variable as a result of a unit change in the treatment variable.

Agricultural Output is the naira (N) of all production from farm operations traceable to the utilization of resources disbursed by a funding agency. The natural logarithm of the value of output is taken to measure the rate of change in production over time between the period of that baseline assessment and the time when the impact of funding program is measured.

Climate Change is the first of the quantitative variables depicted in the model with the potential to influence the volume of agricultural output and, hence, the value of the quantitative variables. Climate change takes two discrete values that are, 1 (unity) for the occurrence of variation in climate condition significance enough to influence output positively, and 0 (nil) for the absence of any such variation significant sufficient to affect the result of agricultural operations negatively.

Government Expenditure was measured by the cumulative annual budgetary allocation by the three tiers of government (federal, state and local governments) to agriculture. The logarithm of the aggregate value was used to measure the rate of change in public expenditure between the baseline and impact measurement periods.

Inflation Rate denoted by the Consumer Price Index (CPI), was used to standardize the actual monetary values of intervention funds, income, output and cash flows. The CPI is extracted directly from the Central Bank of Nigeria's database of indicators for the relevant test period of this research.

The level of Technology, the second quantitative (dummy) variable used in the model is included for its likely impact on agricultural productivity. Typically, the variable takes the value of 1 (unity) for any introduction of the use of modern equipment during the test period, and 0 (nil) for the use of pre-modern tools and implements.

Exchange rate. It also affects the value of funds provided by donor agencies for intervention programs. Considering that almost all donor funds are denominated in foreign currencies, the amounts that beneficiaries finally receive are a reflection of the prevailing exchange rate. When the rate of exchange is favorable is donated by 1 and unfavorable by 0.

Corruption, Corruptions happens in both way, from the agent of the donor and beneficiaries themselves. Monopoly + Discretion – Accountability which, measures how funds are subverted in the programs.

Data Analysis Plan

For the purpose of this study, I used the Eviews statistical package to estimate the OLS multiple regression equations and the necessary diagnostic tests. Structuring the questionnaire is done in a manner that allows for the collation of time series data for the period: 2009 – 2014. It involves the pooling of all respondents into aggregate data to ensure uniformity in the macroeconomic data.

Data Screening

For the purpose of this study, I screened data using tabulation and measures of central tendency. Through the organization of questionnaire data into data tables, I scanned dataset for outliers, missing data, and data errors. Missing data cells and outliers

was validated by referencing the raw data and rectified where appropriate. In validating the incomplete data in the questionnaire is replaced with either mean or median values of response category. Questionnaires with more than 5% error items were excluded entirely from the data organization and elements expunged from data set to ensure uniformity.

Research Questions

Research Question 1: What is the impact of the different agricultural funding sources on poverty reduction and income inequality in Yobe State?

Research Question 2: To what extent does governance system influence the effectiveness of agricultural funding?

Research Question 3: What other consideration affects the success or failure of different sources of agricultural funds in Yobe State?

Research Hypotheses

The objectives of the study are aligned to the following a priori assumption.

$H_0$1: There is no significant positive relationship between standard of living and agricultural funding.

$H_1$1: There is a substantial positive relationship between the level of life and agricultural funding.

$H_0$2: Agricultural financing does not have significant positive impact on the asset-based of farmers in Yobe State

$H_1$2: Agricultural investment has significant positive effects on the asset-based of farmers in Yobe State

$H_0$3: Agricultural funding sources do not have significant positive impacts on the income of beneficiaries.

$H_1$3: Agricultural funding sources have significant positive impact on the income of beneficiaries.

$H_0$4: Agricultural finance sources do not have significant positive impact on agricultural output.

$H_1$4: Agricultural finance sources have significant positive impact on agricultural output.

Technique for Analysis

The Ordinary Least Square (OLS) was used to estimate the four hypotheses formulated for this study. The justification for adopting the generalized least square model is to improve upon estimation efficiency when variance (y) is not a scalar variance-covariance matrix (Chandra & Sarkar, 2015; Cheng & Hansen, 2015). The OLS estimator does not consider the degree in variability as it assigns equal weight to all the variables, therefore, is capable of producing results that Seber and Lee (2012) described as Best Linear Unbiased Estimator (BLUE). In this regard, the multiple regression is the best means of estimating the hypothesis formulated in the study.

I used the multiple regressions to determine the OLS. The multiple regressions in line with the works of Cohen et al., (2013); Keith (2014) as stated thus;

$$Yi = B0 + B1X1i + B2X2i + Ui \text{ ---------- } (3.1)$$

Where; the subscript i runs over observation, $I = 1 \ldots n$; Yi is the dependent variable or the regress and; $X1i + X2i$ are the independent variables or the regressors; B0

+ B1X + B2X are the population regression lines or population regression functions. *B0* is the intercept of the regression line; *B1+ B2* is the slope of the population regression line, and *Ui* is the error term.

Model Specification

To specify the relationship between the variables in line with the objectives, equation *(3.1*) is written thus:

Hypothesis 1

There is no significant positive relationship between standard of living and agricultural funding.

STDL = a0 + b1AGRF1i + B2INFR2i (ctrl)+ B3GOVEXP3i (ctrl)+ Ui ---------- (3.2)

Where STDL is Standard of Living; *AGRF* is agricultural financing sources; *INFR* is Inflation Rate, Corrupt is Corruption Index, *GOVEXP* is government expenditure, and *EXCHRT* is Exchange Rate. *INFR, GOVEXP, and EXCHRT* entered the model as control variables based on the fact that these variables could influence the direction of the standard of living.

Hypothesis 2

Agricultural financing does not have significant positive impact on the asset-based of farmers in Yobe State

AB = a0 + b1AGRF1i + B2INFR2i (ctrl)+ B3GOVEXP3i (ctrl) + Ui ---------- (3.3)

Where AB is Asset-Base

Hypothesis 3

Agricultural funding sources do not have significant positive impact on the income of beneficiaries.

Income = *a0 + b1AGRF1i + B2INFR2i (ctrl)+ B3GOVEXP3i (ctrl)+ Ui --- (3.4)*

Hypothesis 4

Agricultural finance sources do not have significant positive impact on agricultural output

AGO = a0 + b1AGRF1i + B2CC2i (ctrl) + B3TECH3i (ctrl) + Ui ----------(3.5)

Where *AGO* is Agricultural Output; *CC* is Climate Change; and *TECH* is level of technology.

Rationale for Control Variables

Three control variables are necessary for possible inclusion in the regression model. They are inflation, exchange rate and level of corruption. The rate of inflation is considered for its potential likelihood to affect the standard of living and the real value of expenditure and income. Increases in government budgetary allocation may, in fact, be a reflection of price-adjusted envelopes for the agricultural sector. The level of inflation may likely affect the size of the impact that funds may have on the outcome variables namely, income, output, and cash flow. The exchange rate may also change the value of funds provided by donor agencies for intervention programs. Considering that almost all donor funds are in foreign currencies, the amounts that beneficiaries finally receive are a reflection of the prevailing exchange rate. Hence, the rates prevailing at the time of baseline measurement and impact assessment may have to be taken into consideration in

comparing the size of variation in outcome variable due to a corresponding change in the funds allocated by donor agencies. Thirdly, the level of corruption may affect the amount of funds that that eventually get to beneficiaries or the amount that funding agencies budget on intervention projects. One possible means of analysis or determination of corruption is to consider annual surveys of corruption on a sectoral basis and make evidence-based conclusions on the probable impact of corruption on the effectiveness of intervention funds. Where secondary survey data on corruption is unavailable or insufficient, designated questionnaire items are used to attempt to measure the incidence of corruption and its impact on the effectiveness of intervention funds.

Data Interpretation and Decision Criteria

In interpreting data, I laid emphasis on the direction of the correlation coefficients and the tar probability. This level of analysis measures the degree of significance of relationship (Gelman, Carlin, Stern, & Rubin, 2014). Where the probability value is less than 5% confidence interval, the independent, which in this case are the funding sources, is interpreted to have a significant effect on development indicators (Gelman et al., 2014). The direction of the correlation coefficient helps in explaining whether the effect is positive or negative (Gelma et al., 2014). The R-square was used to determine the stability of the model (Cohen, Cohen, West, & Aiken, 2013). Given the nature of the data, it is irrelevant to test for stationery properties, Durbin-Watson test, and Granger causality.

Treat to Validity

External Validity

At the beginning of the study on the effectiveness of agricultural funding sources in Yobe State, two main threats to external validity were identified. First is the ongoing insurgency, which had reported impact on economic activities was likely to have its impact on farming operations and also possibly on funding decisions by funding organizations. These two factors in themselves have the potential to affect the generalizability of findings. For the purpose of future research, the findings risked being replicable only under conditions such as the one prevailing in the northeast, the geographic location of Yobe State. However, to mitigate these threats to external validity, study communities have been carefully selected to exclude areas that have been sufficiently insulated from the Boko Haram insurgency to allow whole development projects to take place.

A second likely threat to external validity is the possibility of the existence of other social and economic variables, which are not, the primary focus of this study but which have the likelihood of to influence the findings of the survey. The strategy adopted to mitigate the threat to validity is to identify and incorporate all such variables in the tool for data analysis as control variables as I have pointed out in the discussion of the variables that were included in the study.

Internal Validity

The greatest threat to internal validity that may arise in the study is potential invalidity resulting from the testing process itself. It is likely that participants may

perceive that the objective of the survey is to determine to determine the future allocation of resources to the programs. Depending on whether a particular respondent assumes that appropriate response may result in the distribution of more or less money to the program, to each respective extent the responses may be influenced by the perception these erroneous assumptions. The recruitment letter stressed, with deliberate emphasis, that this study is purely academic research and that the researcher has no affiliation whatsoever with any of the funding agencies. The strategy is expected to mitigate the threat to validity. This assurance was repeated verbally at the point of administration of the questionnaire.

Construct Validity

The main threat to construct validity of this study is to identify the appropriate measure of "effectiveness" that relates specifically to poverty reduction. At the first level, the literature on funding intervention program in Nigeria and the north east in particular define effectiveness variously concerning local community ownership, participatory development, food sufficiency, food poverty, income poverty, empowerment, gender participation, etc. On the level of poverty indicators, the literature on social development treats poverty variously from the basic needs approach to the human development and the income approach. These different conceptions of poverty and poverty alleviation throw up a myriad of poverty measures that forms the objectives of various kinds of intervention and, therefore, presents a challenge to construct validity. In response to this challenge, I conducted a concept mapping of poverty on the one hand, and program performance indicators on the other. I, therefore, isolated for measurement, only those

indicators that are common to both phenomena (poverty and program performance indicators) and that are expressible in quantitative forms. This strategy adopted is removed any ambiguity associated with concept definition and thus improve the validity of the conclusions.

Ethical Concern

In the proposed study, the primary ethical concern expected is the issue of privacy of the respondents. According to Babbie (2014) respondents' privacy is paramount, and the researcher must never guide the respondents towards bias or preferences for particular research outcome. It is, therefore, very essential to give respondents the option of either remaining anonymous or openly identified. The reason is due to religious and cultural nature of the study area (Ome & Casimir, 2015). Nwosu, Anthony, Vivian, and Nwankwo (2015) posited that culturally and religiously, the role of women in the area are such that they are not expected to participate openly or engage in an active career that may in any way affect their part as wives or mothers. However, it is imperative that they are included in the research, as it provides the data for analysis of gender inequality from the gender perspective. Their non-participation in the research will no doubt impact on the validity and reliability of the research result. While getting them to participate is one thing, convincing them to respond to the questionnaire in a factual manner to the best of their knowledge is another thing. Another group of people that may decide not to provide accurate answers to questions are those that may not want to give out their net worth. This group may feel that giving out their net worth in the survey may lead to its publication. Consequently, structuring the questionnaire in such a way as to hide the

identity of the local respondents, and using moral suasion to convince them, as the sincerity of purpose of the research had to address this concern.

Summary and Transition

This section is a detailed exposition of the proposed methodology adopted in estimating the hypotheses. Specifically, the study explores the quantitative ex-post research design and the Ordinary Least Square as a technique for analysis. There are four assumptions in line with the purpose and objectives. The chapter is an outline of the plan for the collection, analysis and interpretation of empirical data that was generated specifically for the purpose of this dissertation. Chapter 4 follow this structure; the presentation and analysis of empirical evidence were limited only to the information collected for the purpose of this study, and more specifically to data that I organized into the form that is suitable for the method of analysis. They are data that are relevant to answering the questions formulated for this study. The findings in this section provide the basis for the submissions in Chapter 5. The conclusions and recommendations in the final chapter also incorporate the key points and other pertinent information contained in the preceding chapters of this dissertation.

Chapter 4: Results

Presentation and Analysis of Data

Introduction

In this section, data gathered through the use of questionnaire are presented and analyzed. My IRB Approval Number is 07-25-16-019941888888, 07/26/2016. Using descriptive statistics, I presented the data in the form of frequency distributions. I also used simple percentages to establish the characteristics of the questions and responses. I analysed the responses to the questions, estimate the respective hypotheses formulated for the study and accepted or rejected each hypothesis based on the decision criteria of the estimation technique used.

Data Collection

It took me two weeks for the distribution and collection of the data. I also recruited community interpreter to read out the written response of non-literate respondents to them in order to ensure congruence in written and expected response. I distributed a total of four hundred and ninety-eight (498) copies of the surveys. Out of this number the respondent answered, four hundred and fifty-six (456) representing 91.6%, and the number not returned remain forty-two (42) representing 8.4%, while the number of rejected copies was fourteen (14) representing 2.8% because they the forms were not filled correctly. It implied that the analysis of the data was based on Four hundred and forty-two (442) copies representing 88.8% of the total copies distributed. The represented a shortfall of 21.07% of the five hundred and forty-nine (560) respondents proposed in chapter three. The response rate and the proportion used for

analysis were both considered being satisfactory. See Table 1 for the summary of questionnaire response rate.

Table 2

Questionnaire Response Rate

Questionnaire Features	Copies Administered	Copies Returned	Copies Not returned	Copies Rejected	Copies used for Analysis
Absolute Numbers	498	456	42	14	442
Percentage	100%	91.6%	8.4%	2.2%	88.8%

Sources: Field Survey 2016

As reported in chapter 3, the population of the beneficiaries of the agricultural funding programs is approximately 1,099,908 spread as follows: - Community-Based Agricultural and Rural Development Program (CBARDP)/International Funds for Agricultural Development (IFAD) 1,057,472, National Program on Food Security (NPFS) 18,756, and National Fadama Development Project 23,680. Since it was impossible for the researcher to reach the entire population, the Taro Yamane formula was used to determine the sample size, which is 560 respondents. To mitigate the threats to external validity, communities were carefully selected to exclude areas that have been sufficiently affected from the Boko Haram insurgency. The objective of excluding areas affected by Boko Haram insurgency is to effectively evaluate the performance of agricultural under peaceful environment.

Educational Background of Respondents

Information on the distribution and return of questionnaires is presented in table 1. I distributed a total of 498 copies of the surveys. Out of this number the respondent answered, 456 representing 91.6%, and the number not returned remain 42 representing

8.4%, while the number of rejected copies was 14 representing 2.8% because they the forms were not filled correctly. It implied that the analysis of the data was based on 442 copies representing 88.8% of the total copies distributed. The response rate and the proportion used for analysis were both considered being satisfactory.

Table 3

Educational Background of Respondents

Respondents Highest Qualification	O. Level	B.Sc.	Master	Ph.D	Total
Number of respondents	257	173	12	0	442
Percentage	58.2%	39.1%	2.7%	0%	100

Source: Field Survey 2016

I used Table 3 to present the educational of the respondents, which is critically to the performance of agricultural funding. Traditionally, beneficiaries with higher educational are expected to perform better than those with low educational background. From the table, it is evident that 58.2% of the respondents are school certificate holder with no higher educational background. This characteristic might adversely affect the performance of agricultural funding in the Yobe State.

Table 4

Gender of Respondents

Gender	Frequency	Percentage
Male	355	80.3%
Female	87	19.7%
Total	442	100%

Source: Field Survey 2016

Table 4 is used to present the gender distribution of the respondents. The results showed that 80.3% of the respondents are male, while 19.7% are female. This could be

explained by the culture and religion of the people. Specifically, indigenes of Yobe State are predominantly Muslims with low education enrollement rate (Agbiboa, 2014). Under such cultural background, woman rarely take-up formal employment, and in some cases are excluded from agricultural financing because of the repayment clauses. Some husbands also prohibit their wives from engaging in any form of economic activities that involves borrowing. These demographic characteristics could also inhibit the effectiveness of the fund.

Table 5

Age of the Respondents

Age (Years)	Frequency	Percentage
18-40	82	18.6%
41-50	186	42.1%
51-60	127	28.7%
61-Above	47	10.6%
Total	442	100%

Source: Field Survey 2016

Nigerian law protects infants (persons below the age of 18) from entering into an enforceable economic contract, except contract of necessary (Nwogugu, 2014). The Funds complied with this legislation by excluding persons below (18) years. However, the distribution of the fund is skewed in favour of person above (40) years. I showed in Table 4 that only 18.6% of the respondents were between the age ranges of 18-40. The age creteria might also affect the performance of the fund, since agricultural activities requires energetic people, especially in developing economies, were the use of crude implements are very common.

Table 6

Predominant Activities of the Respondents

Farming	Frequency	Percentage
Primary Occupation	317	71.7%
Secondary Occupation	125	28.3%
Total	442	100%

Source: Field Survey 2016

The objective of the information presented in table 6, is to distinguish respondents whose primary activities are agriculture (full) from those that are into agriculture as secondary activities. The results showed that the respondents and beneficiaries of the fund are primary farmers representing 71.7 per cent of the represents. One will be tempted to conclude, that extending funding to primary farmers will enhance the performace of agriculture, given that secondary farmers are distracted by their series of activities. The conclusion may be erroneous in given that secondary farmers in Yobe State are the most educated, with government connection and access to fund. Their ventage position enables them to employ skilled manpower, use modern equipment, and acquire vast hectares of land, which will ultimately enhance the performance of the fund.

Table 7

Number of Years in Farming

Number of years	Frequency	Percentage
0-5	95	21.5%
6-10	194	43%
11-15	111	25.1%
Above 16	42	9.5%
Total	442	100%

Source: Field Survey 2016

I used table 7 to present the years of agricultural distribution of the respondents. Generally, the number of years a respondent has engaged in agriculture could be used to guage experience. Experience is considered vital for the effective functioning of the fund.

Table 8

Effect of Agricultural Funding on Standard of living

Primary Farmers	Very Positive	Positive	Undecided	Negative	Very negative	Total
Before Benefiting from the Fund	5 (1.1%)	4 (9%)	17 (3.8%)	271 (61.3%)	145 (32.8%)	442
After Benefitting from the Fund	5 (1.1%)	6 (1.4%)	22 (5.0%)	296 (67.0%)	113 (25.6%)	422
Probability of Intervention Improving Welfare	15 (3.4%)	14 (3.2%)	14 (3.2%)	293 (66.3%)	106 (24.0%)	442
Probability of Intervention not Improving Welfare	8 (1.8%)	13 (2.9%)	16 (3.6%)	312 (70.6%)	93 (21.0%)	442
Total	33	37	69	1172	457	1,768
Cumulative	70	or 4.0%	3.9%	1629	or 92.1%	
Average	8.25	9.25	17.25	293	114.25	

Source: Field Survey, 2016.

I used Table 8 is derived from the responses to questions in section B, which measures the effect of agricultural funding on the standard of living, based on four (4) different attributes of the CEO's total compensation. The expected total frequency of responses is one thousand, seven hundred and sixty-eight (1,768). Of this amount, 33 (1.9%) of the respondents perceived agricultural intervention to have a very positive

effect on the standard of living of the recipients. 37 (2.1%) of the participants recognized the influence as positive. 70 (4.0%) represents the cumulative frequency of those that perceived the intervention as having a positive effect on the standard of living.

On the other hand, one thousand, one hundred and seventy–two (1,172 or 66.3%) saw the effect of the agricultural intervention as being negative while four hundred and fifty-seven (457 or 25.8%) perceived the intervention fund negatively. The cumulative responses that viewed the agricultural intervention as setting back the standard of living were therefore 92.1%. Sixty-nine (69 or 3.9%) were undecided and clearly, a greater proportion of the responses saw the effect of the effect of agricultural funding on the standard of living as being negative. The average frequencies of the replies are very negative (8.25), negative (9.25), undecided (17.25%), positively (293) and very positively (114.25%). These common responses were used to test hypothesis one.

Table 9

Effect of Agricultural Funding on Asset-Base of Beneficiaries

Primary Farmers	Very Positive	Positive	Undecided	Negative	Very negative	Total
Before Benefitting	30 (6.8%)	23 (5.2%)	20 (4.5%)	251 (56.8%)	118 (26.7%)	442
After Benefitting	24 (5.4%)	37 (8.41%)	27 (6.1%)	242 (54.8%)	112 (25.3%)	442
CEO's contingent pay	40 (9.0%)	40 (9.0%)	14 (3.2%)	219 (49.5%)	129 (29.2%)	442
CEO's incentive pay	16 (3.6%)	21 (4.8%)	23 (5.2%)	270 (61.1%)	112 (25.3%)	442
Total	110	121	84	982	471	1,768
Cumulative	231 or 13.1%		4.8	1,453 or 82.2		
Average Responses	27.5	30.25	21	245.5	117.75	

Source: Field Survey, 2016.

I used the questions in Table 9 to determine the effect of agricultural funding on the asset-base of the beneficiaries. The table contains four issues in all with an expected response frequency of 1768. However, 231(13.1%) of the observed responses were of the opinion that agricultural funding has a positive effect on the asset-base of the beneficiaries, while 1,453 (82.2%) were of the view that its effect is negative. The remaining 84 or 4.8% were undecided.

Table 10

Average Net-Worth of the Beneficiaries

	(Naira)
Before Benefitting from the Program	114,656.52
After Benefitting from the Program	382,817.39
Mean difference	268,160.87
t value	15.778
p (<=0.05)	0.00***

Note: *** are significant at 5%
Source: Field Survey, 2016.

The table 10 above was used to validate the beneficiaries' response on asset-base. The aggregate response is consistent with the earlier response in Table 9. Specifically, Table 10 showed that the asset-base of the recipients reclassified as average net-worth have increased after the receipt of the fund. The increase in the net worth of the beneficiaries was statistically significant within the period under review.

Table 11

Asset-Base of the Respondent Before and After the Programs

	First/Last 1-2 years (Naira)	First/Last 3-4 years (Naira)	First/Last 5-6 years (Naira)	First/Last 7-8 years (Naira)	First/Last 8-above years (Naira)
Before Benefitting from the Program	55,958.5	116,384.9	35,535.6	56,713.6	75,759.2
After Benefitting from the Program	137,369.0	422,988.7	144,201.6	165,520.7	251,509.9
Mean difference	81,410.5	306,603.8	108,666.0	108,807.1	175,750.7
t value	25.4	14.3	17.6	14.1	15.8
p (<=0.05)	0.00***	0.00***	0.00***	0.00***	0.00***

***Significant at 5%
Source: Field Survey, 2016.

I used table 11 to demonstrate the behaviour of the asset-base of the beneficiaries before and after benefitting from the fund. For instance, before benefitting from the program, the asset-base of the respondents increased from N55, 958.50 to N116, 384.90 representing 107.98% increase, between two years and four years. The same pattern repeated itself between eight years and above. On the asset-base of the beneficiaries, it improved from N137, 369.00 in the first two years to N251, 509.90, representing 83%. The mean difference and t-statistics showed that the degree of change is statistically significant.

Table 12

Effect of Agricultural Funding on Income

Primary Occupation (Farming)	Very Positive	Positive	Undecided	Negative	Very negative	Total
Before Benefitting From the Fund	123 (27.8%)	260 (58.8%)	24 (5.4%)	19 (4.3%)	16 (3.6%)	442
After Benefitting from the Fund	101 (22.9%)	277 (62.7%)	24 (5.4%)	27 (6.1%)	13 (2.9%)	442
During the period of Accessing the Fund	112 (25.3%)	266 (60.2%)	20 (4.5%)	24 (5.4%)	20 (4.5%)	442
Secondary Occupation (Farming)						
Before Benefitting from the Fund	97 (21.9%)	268 (60.6%)	27 (6.1%)	35 (7.9%)	15 (3.4%)	442
After Benefitting from the Fund	111 (25.1%)	259 (58.6)	21 (4.8%)	27 (6.1%)	24 (5.4%)	442
During the period of Accessing the Fund	112 (25.3%)	257 (58.1%)	25 (5.7%)	20 (4.5%)	28 (6.3%)	442
Total	656	1,587	141	152	116	2,652
Cumulative	2243 or 84.6		5.3	268 or 10.1		
Average Responses	109.33	264.5	23.5	25.33	19.33	

Source: Field Survey, 2016.

Table 12 contains six questions with response frequency of 2,652. The questions are designed to help determine the effect of agricultural funding on the income of the beneficiaries. 2,243 or 84.6% of the observed responses affirmed that the fund has very positive effect on income level, while 268 or 10.1% of the responses are of the opinion that the money negatively affects income level. The values in parenthesis (%) are used to demonstrate specific percentage point of each of the questions. For example, the first column table 12 showed that 27.8% of the respondents whose primary occupation is farming affirmed that the agricultural output has positive impact on their income.

Table 13

Effect of Agricultural Funding on General Welfare

	Very Positive	Positive	Undecided	Negative	Very negative	Total
Capacity Building	38 (8.6%)	27 (6.1%)	31 (7.0%)	238 (53.8%)	108 (24.4%)	442
Record Keeping and Management Skills	17 (3.8%)	23 (5.2%)	27 (6.1%)	279 (63.1)	96 (21.7%)	442
Market Information	22 (5.0%)	28 (6.3%)	31 (7.0%)	263 (59.5%)	98 (22.2%)	442
Group Dynamics	11 (2.5%)	29 (6.6%)	19 (4.3%)	298 (67.4%)	85 (19.2%)	442
Access to Credit	34 (7.7%)	29 (6.6%)	29 (6.6%)	250 (56.6%)	100 (22.6%)	442
Advisory Services	16 (3.6%)	25 (5.7%)	15 (3.4%)	296 (67.0%)	90 (20.4%)	442
Crop Production	9 (2.0%)	30 (6.8%)	14 (3.2%)	298 (67.2%)	92 (20.8%)	442
Livestock	21 (4.8%)	32 (7.2%)	26 (5.9%)	263 (59.5%)	100 (22.6%)	442
Agro Processing	0(0)	0(0)	0(0)	0(0)	0(0)	00
Provision of Grants	0(0)	0(0)	0(0)	0(0)	0(0)	00
Orchard Establishment	0(0)	0(0)	0(0)	0(0)	0(0)	00
Table 12 continue						
Sustainable Land Management	0(0)	0(0)	0(0)	0(0)	0(0)	00
Total	168	223	192	2184	769	3,536
Cumulative	391 Or 11.1%		5.4%	2,953 Or 83.5%		
Average	21	27.875	24	273	96.125	

Source: Field Survey, 2016.

Table 13 contained 12 questions with a valid response on eight questions with an expected response frequency of 3,536 and is design to measure the effect of agricultural funding on auxiliary welfare. Welfares such as capacity building, improvement of record

keeping and business management skills, ability to extract market information or intelligence, capability for access to credit through writing of bankable proposal, group dynamics' and other non-financial services. A total number 391 (11.1%) of the observed responses are of the opinion that agricultural funding positively affects the selected indicators, while 2,953 (83.5%) of the observed responses were of the view that agricultural funding affects the variables negatively, while the remaining 192 (5.4%) were undecided.

Table 14

Effect of Agriculture Funding on Cost and Sales

Cost	Very Positive	Positive	Undecided	Negative	Very negative	Total
Processing Fees	118 (26.7%)	273 (61.8%)	18 (4.1%)	18 (4.1%)	15 (3.4%)	442
Documentation Fees	105 (23.8%)	285 (64.5%)	16 (3.6%)	27 (6.1%)	9 (2.0%)	442
Transportation Fees	110 (24.9%)	269 (60.9%)	23 (5.3%)	26 (5.9%)	14 (3.2%)	442
Sundry Fees	107 (24.2%)	265 (60.0%)	21 (4.8%)	32 (7.2%)	17 (3.8%)	442
Sales Before Benefitting from the Fund	93 (21.0%)	286 (64.7%)	19 (4.3%)	31 (7.0%)	13 (2.9%)	442
After Benefitting from the Fund	89 (20.1%)	286 (65.4%)	10 (2.3%)	38 (8.6%)	16 (3.6%)	442
Period of Accessing the Fund	75 (17.0%)	302 (68.3%)	11 (2.5%)	37 (8.4%)	17 (3.8%)	442
Any other Period	73 (16.5%)	295 (66.7%)	22 (5.0%)	33 (7.5%)	19 (4.3%)	442
Total	770	2,264	140	242	120	3,536
Cumulative	3,024 Or 85.8		4.0	362 or 10.2		
Average	96.25	283	17.5	30.25	15	

Source: Field Survey, 2016.

I used table 14 to measure the effect of agricultural funding cost and sales. Specifically, the value items precisely measure processing fees, documentation, transportation charges, and various charges. The objective is to determine the impact of the cost of accessing the fund on the effectiveness of agricultural funding from the three primary sources. There are eight questions in this cohort with an expected frequency of 3,536. However, 3,024 (85.8%) of the observed responses believe that the agricultural funding has a positive effect on cost and sales. While, 362 or 10.2% were of the opinion that agricultural funding negatively affects sales of the beneficiaries. The remaining 140 or 4.0% were undecided.

Table 15

Effect of Agricultural Funding on Output and Expediture

Output	Very Positive	Positive	Undecided	Negative	Very negative	Total
Before Benefitting from Fund	109 (24.7%)	260 (58.8%)	18 (4.1%)	43 (9.7%)	12 (2.7%)	442
After Benefitting from the Fund	110 (24.9%)	259 (58.6%)	20 (4.5%)	39 (8.5%)	14 (3.2%)	422
Expenditure						
Before Benefitting from Fund	107 (24.2%)	280 (63.3%)	22 (5.0%)	28 (6.3%)	5 (1.1%)	442
After Benefitting from the Fund	88 (19.9%)	280 (63.3%)	25 (5.7%)	32 (7.2%)	17 (3.8%)	442
Total	414	1079	85	142	48	1768
Cumulative	1,493 or 42.2%		2.4%	190 or 5.4%		
Average	103.5	269.75	21.25	35.5	12	

Source: Field Survey, 2016.

In this table (15) I present the response of beneficiaries in respect of the effect of the fund on expenditure and output. There are four questions in this cohort with an expected frequency of 1,493 or 42.2% of the observed responses believe that the availability of the fund positively affects output and expenditure. On the other hand, 190 or 5.4% were of the opinion that access to agricultural funding negatively affects production and expenses of the beneficiaries. The remaining 2.4% were undecided.

Table 16

Effect of Funding on Expenditure Pattern

	Increasing Significantly	Increasing Gradually	Unchanged	Decreasing Significantly	Decreasing Gradually
Before Benefitting from the Fund	0.0%	37 5.1%	147 20.2%	112 15.4%	432 59.3%
After Benefitting from the Fund	401 55.1%	296 40.7%	17 2.3%	9 1.2%	5 0.7%
During the period of accessing the Fund	167 22.9%	397 54.5%	124 17.0%	12 1.6%	28 3.8%

Source: Field Survey, 2016.

In table 16, I present the expenditure pattern of the beneficiaries before and after the fund. This question was used to validate the recipients' response to the question in Table 13. The response corroborates with their earlier assertion that expenditure pattern increased with receiving the intervention fund. The table implied that there is a higher probability that a particular variable of the intervention fund was used for personal consumption.

Table 17

Ease of Accessing the Intervention Funds (Months)

Months	Frequency	Percent
Less than 1 month	31	7.00%
2 to 3 month	41	9.30%
4 to 5 month	107	24.20%
6 to 8 month	125	28.28%
8 to 12 month	138	31.22%
Total	442	100.00%

Source: Field Survey, 2016.

I used table 17 to present the case of accessing agricultural funding amongst the recipients regarding the duration. About 7% of the respondents said they got the fund within one month after application. Similarly, 9.3% of the respondents accessed the capital after two to three months of use. A larger proportion of the recipients representing over 80% accessed the fund between 4 months and one year. The table simply shows that the average period for accessing the three capital sources is roughly one year.

Table 18

Beneficiaries Perception of Access Time

	Frequency	Percent
Very positive	98	22.17%
Positive	243	54.98%
Undecided	14	3.17%
Negative	66	14.93%
Very Negative	21	4.75%
Total	442	100.00%

Source: Field Survey, 2016.

I used table 18 analyze the perception of borrowers on the time frame for accessing the fund. The result showed that contrary to the late period or long time

duration in accessing the fund, the respondent strongly feel positive about the time frame. 77.5% of the total respondent firmly believes that the time frame for obtaining the fund is relatively good and will impact positively on the perception of the beneficiaries.

Test of Hypotheses

The four hypotheses formulated for the study were tested in this section. The analysis of varianc (ANOVA) and t-test were estimated with the use of statistical Package for Social Sciences 17.0 version (SPSS).

Hypotheses 1

$H_0$1: Generally, there is a no significant positive impact on agricultural funding and standard of living of the beneficiaries.

*Hi*1: Generally, there is a significant positive impact on agricultural financing and standard of living of the recipients.

Table 19

SPSS t-test Results for Hypothesis 1

One Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Standard of Living of the Beneficiaries	1768	1.3003	.91628	.02179

One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Standard of Living of the Beneficiaries	59.672	1767	.000	1.30034	1.2576	1.3431

ONEWAY ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	557.798	4	139.450	265.576	.000
Within Groups	925.722	1763	.525		
Total	1483.520	1767			

Decision Rule

With a calculated *t*-test value of 59.672 with a sig. (2-tailed) value of 0.000, which is greater than the critical *t* value of 1.96, the null hypothesis should be rejected. This result is supported by the ANOVA result, which has a calculated *F* value of 265.576 with a sig 0.000, which is greater than the critical *F* value of 2.37. Therefore, I reject the null hypothesis and accept the alternate hypotheses. The conclusion therefore is that the there is a significant positive impact between agricultural funding and standard of living of the beneficiaries.

Hypothesis 2

$H_0$2: Agricultural funding does not have significant adverse impact on the asset-base of the recipients.

$H_1$2: Agricultural funding has significant negative impact on the asset-base of the recipients.

Table 20

SPSS t-test Results for Hypothesis 2

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Asset-Base of the beneficiaries	1778	1.7700	1.26973	.03011

One-Sample Test

	Test Value = 0

	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Asset-Base of the Beneficiaries	58.779	1777	.000	1.76997	1.7109	1.8290

ONEWAY ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	294.761	3	98.254	-67.818	.000
Within Groups	2570.155	1774	1.449		
Total	2864.916	1777			

Decision Rule:

With a calculated t-test value of -58.779 with a sig. (2-tailed) value of 0.000, which is less than the critical t-value of 1.96, the alternate hypothesis should be rejected. This result is supported by the ANOVA result, which has a calculated F-value of -67.818 with a sig. 0.000, which is less than the critical F-value of 2.60; I reject the alternate and accept the null hypothesis. The conclusion therefore is that agricultural funding does not have significant negative impact on the asset-base of the beneficiaries.

Hypothesis 3

H_o3: Agricultural funding does not have significant negative impact on the income of the beneficiaries.

H_i3: Agricultural funding has significant negative impact on the income of the beneficiaries.

Table 21

SPSS t-test Results for Hypothesis 3

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Income of the Beneficiaries	2,652	1.5554	1.06889	.02076

One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Income of the Beneficiaries	74.938	2651	.000	1.55543	1.5147	1.5961

ONEWAY ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	280.866	5	56.173	54.088	.000
Within Groups	2747.986	2646	1.039		
Total	3028.852	2651			

With a calculated t-test value of 74.938 with a sig. (2.tailed) value of 0.000, which is greater than the critical t-value of 1.96, the null hypothesis should be rejected. The result has a calculated F – value of 54.088 with a sig. 0.000 which is greater than the critical F- value of 2.21. I fail to accept the null hypothesis. Our conclusion therefore is that Agricultural funding does not have significant negative impact on the income of the beneficiaries.

Hypothesis 4

H_o4: Agricultural funding does not have significant negative impact on the output of the beneficiaries.

H_I4: Agricultural funding has significant negative impact on the output of the beneficiaries.

Table 22

SPSS t-test Results for Hypothesis 3

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Agricultural Output of the Beneficiaries	3,536	2.3648	1.58756	.02670

One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Agricultural Output of the Beneficiaries	88.578	3535	.000	2.36482	2.3125	2.4172

ONEWAY ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2365.006	7	337.858	182.135	.000
Within Groups	6544.377	3528	1.855		
Total	8909.383	3535			

With a calculated t-test value of -88.578 with a sig. (2-tailed) value of 0.000 which is less than the critical t-value of 1 .96, the alternate hypothesis should be rejected. This result is supported by the ANOVA result, which has a calculated F-value of -18.135

with a sig. 0.019, which is less than the critical F-value of 2.01. I reject the alternate hypothesis. The conclusion therefore is that there is no positive effect of Agricultural funding on the agricultural output of the beneficiaries.

Test of robustness

To strengthen the survey design results, additional econometric estimation was employed using the ex post facto research design. This enabled the researcher establish the the effectiveness of funding sources on agricultural projects in Yobe State, Nigeria, and employed the Pooled Ordinary Least Square Regression, in order to strengthen the survey result for the period: 2009-2014.

Table 23

Summaries of Pooled Ordinary Least Square Results

Critical Decisions	Predicted Direction	Actual Direction	Statistical Significance
Standard of Living (Hypothesis 1)	(-)	(+)	Yes
Asset-Base (Hypothesis 2)	(-)	(+)	Marginal
Income-Level (Hypothesis 3)	(-)	(+)	Marginal
Agricultural Outout (4)	(+)	(+)	Marginal

Source**:** EVIEWS 9 Analytical Software (See appendix A for the data used)

The robustness test result in Table 5 (see Appendix B for details of the results) revealed that the coefficients of agricultural funding from the different sources are positively correlated to the standard of living, asset-base, income level and agricultural output of the beneficiaries. Thus, the results revealed that aggregate funding sources on agricultural projects in Yobe State, Nigeria, have impacted positively on the general well-

being of the recipients, and consistent with the First-Best Resource Allocation theory of the welfare economics. Specifically, Arrow, Dasgupta, Goulder, Mumford, and Olleson, (2012) argue that substantial saving constitutes an actual measure of welfare changes in asset-base, agricultural output, income per capita and household income over time interval if the resource allocation is first best.

In line with the objective of this research work which, I tested the impact of the selected funding sources on the standard of living, asset-base, income level and agricultural output of the beneficiaries. I equally decomposed the respondents along Fadama III, National Program for Food Security (NPFS), and International Fund for Agricultural Development (IFAD) programs.

The first hypothesis was used to test the impact of the different funding sources on the standard of living of the beneficiaries. The regression results show that the coefficients of agricultural funding as indicated in Table 4.6 had a positive and significant impact on the standard of living of the beneficiaries for FADAMA 111 (0.421985), and positive but insignificant impact on NPFS (0.009788) and CBARDP/IFAD (0.359487). These findings show that the FADAMA 111 project in the most effective in poverty alleviation compared to the other two in Yobe State.

The second hypothesis was used to test the impact of the different funding sources on the asset-base of the beneficiaries. The regression results show that the coefficients of agricultural funding as indicated in Table 4.6 had a positive but insignificant impact on the asset-base of recipients for FADAMA 111 (0.0.459932) and NPFS (0.280752), but the negative and insignificant impact for CBARDP/IFAD (-1.431814). The findings show

that the FADAMA 111 project is the most effective in improving the asset base of the beneficiaries compared to the other two in Yobe State.

The third hypothesis was used to test the impact of the different funding sources on the income of the recipients. The regression results show that the coefficients of agricultural funding as indicated in Table 4.6 had an active and significant impact on the standard of living of the beneficiaries. The result show for FADAMA 111 with (0.202420), and positive but insignificant impact for CBARDP/IFAD with (0.200937) but the negative and insignificant impact for NPFS (-0.409142). These findings show that the FADAMA 111 project in the most effective in improving the income of the beneficiaries compared to the other two in Yobe State.

The fourth hypothesis was used to test the impact of the different funding sources on the agricultural output of the beneficiaries. The regression results show that the coefficients of agricultural funding as indicated in Table 4.6 had a positive but insignificant impact on agricultural output of recipients for FADAMA 111 (0.536895), but the negative and insignificant impact on NPFS (-0.108685) and CBARDP/IFAD (-1.410621). These findings show that the FADAMA 111 project in the most effective in increasing the output of the beneficiaries compared to the other two in Yobe State.

Table 23

Decomposed Results of the Funding Sources

Variables	FADAMA 111	NPFS	CBARD/IFAD
Standard of Living	0.421985*	0.009788	0.359487
(STDL)	(0.104983)	(0.178475)	(0.359487)
Asset-Base (AB)	0.459932	0.280752	-1.431814

	(0.363373)	(0.252385)	(0.700797)
Income	0.202420*	-0.409142	0.200937
	(0.097672)	(0.277774)	(0.230535)
Output (AGO)	0.536895	-0.108685	-1.410621
	(0.373893)	(0.409056)	(0.796404)

*Statistically significant at 5%

Values in parentheses represent the standard error

For Details of Results, see Appendix C.

Chapter 5

Summary of Findings, Conclusion, and Recommendations

Introduction

The purpose of this study is to use the first best resource allocation theoretical framework to investigate the effectiveness of agricultural funding from different sources in Yobe State. Consistent with the first best resource allocation theory, community development is measured with income levels, poverty alleviation, assets acquisition, and agricultural outputs. Indicators such as inflation rate, government expenditure, level of technology, climate change, exchange rate and corruption that could influence beneficiaries' welfare were introduced as controlled variables in the model. The funding sources considered in the study are the Fadama III, NPFS, and Community-Based Agricultural, and Rural Development Program (CBARDP/IFAD).

The nature of the study is ex- post facto research design with the quantitative focus, utilizing data from secondary sources. The decision to choose the ex-post facto research design is based on the fact that I relied extensively on historical data that already exist. Quantitative measurement was also carried out to determine the relationship between the flow of funds to the agricultural sector from three primary sources such as statutory government allocations, foreign development assistance and loans and advances to the sector.

No current studies on the relationship between the sources of agricultural funding and their impact on income and poverty reduction at the state level in Nigeria exist. Even the studies involving multiyear assessment are stand-alone - case studies. This research

work on the relationship between the sources of agricultural funds and their impact on development indicators such as poverty alleviation, income equality and asset acquisition at a state level is the first similar one in Nigeria. I undertake this study to identify the most efficient ways of creating positive social change to Yobe state and Nigeria in general through effective utilization of agricultural intervention funds. This positive social change will certainly contribute to poverty reduction, expanding economic opportunities and improving the quality of life of the people, leading ultimately to sustainable peace and economic prosperity in the region.

Summary of Findings

The findings from the study summarized in this section are in line with the tested hypotheses and objectives of the study.

1. Agricultural funding has significant positive impact on the standard of living of the beneficiaries. This finding is consistent with the First-Best Resource Allocation theory of the welfare economics. The positive impact of agricultural funding is defined based on the standard of living of the beneficiaries as welfare change along the first-best optimal.
2. Agricultural funding has significant positive impact on the asset-base of the recipients. The result is consistent with the managerial hegemony theory, which posits that incentive pay in the form of intervention helps in bringing out the administrative skills of the beneficiaries of the intervention regarding increasing their asset base, which also improves performance.
3. There is no significant positive effect on agricultural funding and the income of the beneficiaries. The result is consistent with the First-Best Resource Allocation theory of

the welfare economics. Where resources are efficiently allocated, which in case, is ensuring that the fund is used purely for agricultural purpose, it will automatically increase the income of the beneficiaries, which amount to positive welfare change.

4. Agricultural funding has a positive impact on the output of the recipients. The positive relationship found between agricultural financing, and agricultural production of the beneficiaries counteracts the argument that tight control can be counterproductive, which is against the First-Best Resources Allocation theory. Specifically, the theory argues that were farmers are censored, and lending conditionalties prohibit the beneficiaries' discretion; it could set back the productivity and output of the recipients.

5. Finally, the results suggest that the FADAMA 111 project is the most efficient concerning improving the overall welfare of the beneficiaries, compared to the National program on Food Security (NPFS); and Community-Based Agricultural and Rural Development Program (CBARDP)/IFAD. The result could be attributed to the structured nature of the FADAMA 111 project and the requirement for counterpart funding by the Local, State, and Federal governments. Specifically, under the FADAMA 111 project, the project model is community-driven. It also includes capacity building, public infrastructure, inputs, adaptive research, extension services, knowledge transfer, and group-owned productive assets through matching grants, advisory services, land management improvements, and mechanisms to avoid or resolve conflicts among Fadama resource users. Fadama are floodplains and shallow aquifers found along Nigeria's major river systems; the first Fadama project focused on these systems, but

Fadama II & III move beyond floodplain systems to cover a diverse range of agro ecosystems, productive activities, and land uses.

Interpretation of the Findings

The result of the first hypothesis revealed significant positive impact between agricultural funding and standard of living of the beneficiaries. This finding is consistent with the findings of Arrow et al. (2012); Hamilton and Hartwick (2014), but contradicts the results of (Pender, Weber, Johnson, and Fannin, 2014). The contradiction could be explained by the peculiarities of the different funding patterns and contracts. Specifically, the funding with the highest number of beneficiaries in Yobe State is the FADAMA11 project. This funding source has government buy-in, in the form of counterpart fund, which is a precondition for access the loan. It also uses the Grameen model, which encourages the farmers to form themselves into cells (social and cultural cohesion). This ensures that the fund is not misapplied and there is the existence of social structure that enforces voluntary repayment. Similarly, the rural nature of the beneficiary communities is a catalyst for the positive effect of the fund on the standard of living of the people. Specifically, the fund is extended to beneficiaries for animal husbandry and other farming types that are extremely adaptable to the rural community at lesser cost. The beneficiaries' consumption pattern, which largely depends on local outpus from their farmlands, is also another important factor.

The result of the second hypothesis also revaeld significant positive impact between funding sourcesand the asset-base of the beneficiaries. This finding is consistent

with the managerial hegemony theory, which posits that incentive pay in the form of intervention helps in bringing out the administrative skills of the beneficiaries of the intervention regarding increasing their asset base, which also improves performance. This is consistent with the findings of Knutsson (2009), but contradicts the findings of (Booth, 2011; Griggs et al., 2013; Sen, 2003; Sen, 2013). The disagreement in empirical literature brings to the fore, the imperativeness of conducting studies on social change among homogenous units. The concentration of my study on rural communities in Yobe State eliminates heterogenous biases such as difference in culture, average weather condition, standard of living, consumption pattern, technological innovation, among others, which constitute a serious bias in study cross-country or cross-subnational studies.

The result of the third hypothesis of this study revealed that there is no significant positive effect between agricultural funding and income of the beneficiaries. The finding is consistent with the results of some researchers (; Asaju, Adagba, & Kajang, 2014; Finger, & El Benni, 2014; Ozumba, 2014; Whitfield, 2012), but contradicts the findings of others (Collier & Dercon, 2014; Jarboui, Forget, & Boujelbene, 2014; Kanbur, & Sumner, 2012; Lloyd-Jones & Rakodi, 2014; Ojiako & Ogbukwa, 2012). The mixed empirical findings in literature could be attributed to measures of income level adopted and the timining in income definition. Specifically, the respondents defined their income as average sales during the harvest season. This definition could be misleading because of the interactive effect of so many factors. First, the size of the family and dependent relatives could cause serious variation on the quantity produced and sold. Second, general price level is also a determining factors, as price depression could be interpreted as lower

income, without recource to the actual output, while inflationary pressure could also be interpreted as higher income without taking into cognizance of the real income. The problem is even compounded by the near lack of records or poor accounting literacy among the respondents. Studies should strive to adopt a standard measure that would yield robust results. Credible record keep should be a precondition for accessing these funds. The beneficiaries could be compelled to participate in basic financial and accounting education before and after access the fund. Their records could be reviewed periodically to ensure compliance.

The fourth hypothesis, which revealed that agricultural funding has a positive impact on the output of the recipients, is consistent with the findings of (Toby, & Peterside, 2014), but contradicts the findings of Masset, Haddad, Cornelius, & Isaza-Castro (2012). The mixed results could be explained by the nature and size of the receipients agricultural activities. Apriori, agricultural funding is expected to improve output because of high yields. However, the probability of high yield could also depend on the weather, improve seedlings, and support services such as extension farming, level of farm input, among others. Though, the study strived to address some of these moderating factors, future study could adopt a uniform period in conducting the field survey. Such survey would be more appropriate immediately after the harvest season. The measurement of output also constitutes another problem in view of the difference in the gestation period of the various outputs.

The theoretical framework is consistent with the First-Best Resource Allocation theory of the welfare economics. Specifically, the findings showed that where resources

are efficiently allocated, which in this case, is ensuring that the fund is used purely for agricultural purpose, it automatically increase the income of the beneficiaries, which amount to positive welfare change of the beneficiaries along the first-best optimal. For instance, the results suggest that the FADAMA 111 project is the most efficient concerning improving the overall welfare of the beneficiaries, compared to the National program on Food Security (NPFS); and Community-Based Agricultural and Rural Development Program (CBARDP)/IFAD. The result could be attributed to the structured nature of the FADAMA 111 project and the requirement for counterpart funding by the local governments. Specifically, under the FADAMA 111 project, the project model is community-driven. It also includes capacity building, public infrastructure, inputs, adaptive research, extension services, knowledge transfer, and group-owned productive assets through matching grants, advisory services, land management improvements, and mechanisms to avoid or resolve conflicts among Fadama resource users. Fadama are floodplains and shallow aquifers found along Nigeria's major river systems; the first Fadama project focused on these systems, but Fadama II & III move beyond floodplain systems to cover a diverse range of agro ecosystems, productive activities, and land uses.

Limitations of the Study

It would have been ideal to cover the entire beneficiaries Yobe State, in order to enhance the generalizability of the research findings. Another ideal approach is to conuct carry out an exhaustive assessment of the impact of the various agricultural funding programs on income and poverty at the household level, which is consistent with household survey. However, I could not exhaustively cover the entire populations

because of resource and time constrains. Importantly, Yobe State has been ravaged by the activities of Boko Haram insurgency. The insurgency disrupted agricultural activities, resulted in lose of lives and properties, and most communities were displaced. Some of the beneficiary communities are currently in Internally Displaced People's homes (IDPs) because of the activities of insurgents in those communities.

Undertaking a study on the effectiveness of agriculture funding in such communities is not practically feasibility because of accessability to those communities, and most importantly, the result of such study would be spurious. To circumvent these limitations, the study selected only communities in Yobe State that were insulated from the crisis. The selected communities represented 47% of the total population of the state, spread across the entire state to include Tarmuwa, and Guba in Yobe East; Fika, Gadana and Chana in Yobe-West; and Nguru, Amshi, and Karasuwa in Yobe-North (National Population Commission [NPC], 2015). The identification and selection of participants for the study was also done using selection criteria that are as representative of the communities in Yobe State as possible. Also, the number of beneficiary communities, as well as individual beneficiaries within the communities selected, was sufficiently large enough to enhance the validity of the findings and the quality of the conclusions drawn the spread.

Another limitation that threatened the external validity of the study is the level of education of the participants, which imposes the problem of data integrity. I circumvent this limitation by using the interview in addition to the questionnaire. I also recruited the servicese of local intrepeters to ensure that their responses are read to them for

endorsement. Thus what the study lacks in the spread was also sufficiently compensated for in depth.

Recommendations

Based on the findings of the study, I made the following recommendations;

1. **Promotion of Favourable Economic Conditions**: One economic condition that is essential to improved welfare is favorable macroeconomic conditions. Data released by National Bureau of Statistics (NBS) revealed that year-on-year inflation grew from 7.13% in July 2016 to 17.60% August 2016. Similarly, the Nigerian economy entered into recession in the second quarter of 2016, as NBS data showed that the economy witnessed a negative growth rate of -0.36% and -0.26% in the first and second quarter of 2016 respectively. Such economic recession and inflationary pressure erodes the purchasing power of the citizens and increases the cost of borrowing. For the beneficiaries of the fund, it also undermines the value of the grant they received, which could inadvertently affect the effectiveness of the fund. Similarly, the constant devaluation of the Naira against other foreign currencies also sets back the efficiency of the funding sources. The importation of most agricultural equipment and some seedlings for the beneficiaries of the intervention fund is also another factor to consider. Spiral depreciation of the Naira increases the cost of that external input and imports inflation to the Nigerian economy. Operating in a favorable macroeconomic environment will enhance the effectiveness of the fund.
2. **Need for Consistent Agricultural Policy**: Consistency in government agricultural policies will serve as a catalyst for promoting the efficiency of agricultural funding

sources. It helps donors plan with flexibility in terms aligning their intervention policies with the developmental objectives of the government. For instance, it would be substantial for the Nigerian government to continue with the FADAMA III project even if the World Bank withdraws from the project.

3. **Liberalization of Trade especially for Agricultural Products:** Non-tariff trade measures often cited as major obstacles to sub-regional and regional trade. These cover a diverse array of policies that countries apply to imported and exported goods such as agricultural products, technical barriers to trade (TBTs), price control measures, import and export licensing, inspections, as well as rules determining the origin of goods for tariff treatment. It is interesting to note that the contribution of non-tariff measures to overall agricultural trade restrictiveness is significant, and in some estimates, these measures are far more trade restrictive than tariffs account for about 30 percent of international business costs.

4. **Government Must Invest Massively in Infrastructure:** Yobe State government and Nigeria in general need to commit more resources to infrastructural investments to address supply-side constraints as sub-optimal investment productivity will hinder the long-run growth rates necessary for sustained and transformative agricultural development. It is imperative to identify and put in place measures that address internal and external structural gaps instead of focusing on grants from foreign aids.

5. **Development of Agricultural Capacities as Components of the Fund:** Funding sources for agricultural purposes must incorporate capacity building in its packages to the beneficiaries. There is a lot of room for farmers to leapfrog by adopting and pursuing

innovative capacity building skills. It is important to note that innovation does not occur automatically but countries that are proactive in implementing a national innovation strategy have achieved more equitable development outcomes. For agricultural funding to be effective, it must adopt and drive agricultural technological changes focused on the creation and dissemination of knowledge. The integration of manufacturing industries with high local content, which the agricultural sector provides, delivers more value added and growth than an export model based on the processing of imported inputs.

6. **Agricultural Funding Must Be Export-Oriented:** Agricultural funding must target micro small and medium scale farmers that are also export oriented. Policy makers should anchor export - led the development of Agricultural funding as a strategy geared towards improving their competitiveness. It is well established within the literature that exports and imports of intermediate and capital goods tend to increase the competitiveness of enterprises and economies as a whole. Greater and better integration of agricultural interventions through the elimination of trade barriers can reduce the structural heterogeneity and in turn will foster productivity gains.

7. **Institutionalization of Social Safety Nets to Act as a Catalyst to Promoting Productivity:** Nigeria must ensure that as part of measures to improve the effectiveness of agricultural funding, social safety nets must be put in place to cushion possible hardships. Government and non-governmental organization should consider supporting rural folks engaged in agricultural production. There would be the need for pro-poor policies that are gender sensitive and also takes care of the needs of people with

disability. Overall, there must be deliberate strategies geared towards achieving inclusive growth and sustainable development.

8. Legislation that Ensures Deduction of Counterpart Payment from Source: Since the amount of counterpart fund is a precondition for receiving the World Bank assistance. The amount of counterpart fund by the local government should be mandatory. Currently, not all Local Government Areas in Yobe State are benefitting from the fund because of the inability of the affected local governments to pay their counterpart fund. One solid strategy for increasing participation is making it making mandatory and deducting from source.

9. Entrenchment of Proper Measures: The projects and donor agencies should ensure that proper measures are put in place to ensure that service providers execute the projects to specification. Most beneficiaries complained that service providers procure low-quality materials to unsuspecting beneficiaries. Such fraudulent practice could hinder the effectiveness of the project.

10. Education of the Beneficiaries: Education has been identified as a success factor in poverty eradication. Specifically, empirical studies have shown that welfare level increases with increase in formal educational attainment. Beneficiaries without any formal education are usually the poorest among the rural farming household. Literacy program should be incorporated as part of the responsibilities of the state and a precondition for accessing the fund. It is on record that larger household sizes have been found to have a correlation with poverty, particularly when the family head engages in agriculture for livelihood and income (Rondanini, Gomez, Agosti, & Miralles, 2012). The

literacy program would also help in sensitizing the people on birth control and some cultural beliefs that inhibit the effectiveness of the program. There is also the need for efforts at further educating the populace on the need to control birth and to remove all cultural beliefs that tend to lead to overpopulation should be encouraged through proper advocacy.

Policy Implications

The findings of this study have important implications for agricultural funding in Yobe state and Nigeria in general. To date, studies along this line could be categorized into two separate research streams having examined the effectiveness of agricultural funding in Nigeria. One stream has reviewed the impact of agricultural funding on the standard of living. Another stream, which we address here, examines the effectiveness of the sources of financing of the general welfare of the beneficiaries. Whereas the former stream has reached a dead end, this study's results suggest that the following flow warrants further exploration especially in less developed economies where one of the strategies of the government or poverty alleviation is the attraction of foreign grants.

In this research work, I found positive relationships between agricultural funding and beneficiaries' welfare indicators such as standard of living, asset-base, income and agricultural output. The positive relationships found to provide strong support for the predictions of the First-Best Resources Allocation theory. Similarly, the results showed that FADAMA III project is the most effective in promoting the welfare of the beneficiaries. I hope the results presented in this research work will stimulate new

directions in future research on the impact of agricultural funding sources on the welfare of recipients in other federating units in Nigeria.

The findings do not lend support to the widespread belief within the farming community that conditionalities and procedures for accessing foreign grants could diminish the welfare of the people and improvised them the more. However, this result should be interpreted with caution since practical realities tend to suggest that the genetically modified seedlings and other specifics of parent and grandparent stocks for poultry farmers could increase over dependence on developed economies. Some of the concerns raised by the respondents include the forward contracts that protect the biotechnology companies' rights to seed given their extensive investment in research and development. Other issues include the lack of technology to use and retain the seeds, lost of natural (traits) seedlings and the adverse effect of the modified seedlings on the ecology of the farmers.

Conclusion

This study examines the effectiveness of agricultural funding in Yobe State using the First-Best Resource Allocation theory of the welfare economics theoretical framework. The funding sources investigated are the FADAMA 111 project, the National Program on Food Security (NPFS); and Community-Based Agricultural and Rural Development Program (CBARDP)/IFAD. Generally, policy formulation on agricultural funding in Nigeria rely extensively on aggregated studies of all states in Nigeria or along the geo-political zones. Technically, relying on such studies for policy formulation could be misleading since it mask the pecularities of the respondents and the funding sources.

For instance, the structure and conditionalities attached to the loan, the culture of the people, their level of education, and involvement of Federal, state and local government, have been established as factors that could impact on the effectiveness of agricultural funding, and attempt to mask these heterogeniety could produce misleading results.

To resolve the deficiencies associated with aggregated studies, in this study I use Yobe State as my populations. I used the first best resource allocation theoretical framework to investigate the effectiveness of agricultural funding from different sources in Yobe State. In line with the first best resource allocation theory, community development is measured with income levels, poverty alleviation, assets acquisition, and agricultural outputs. Indicators such as inflation rate, government expenditure, level of technology, climate change, exchange rate and corruption that could influence beneficiaries' welfare were introduced as controlled variables in the model.

The nature of the study is ex- post facto research design with the quantitative focus, utilizing data from secondary sources. The decision to choose the ex-post facto research design is based on the fact that I relied extensively on historical data that already exist. Quantitative measurement was also carried out to determine the relationship between the flow of funds to the agricultural sector from three primary sources such as statutory government allocations, foreign development assistance and loans and advances to the sector.

The results showed that agricultural funding has significant positive impact on the standard of living, ouptut and asset-base of the beneficiaries. However, the findings

revealed that there is no significant positive effect between agricultural funding and the income of the beneficiaries. One of the most effective funding source, the results suggest that the FADAMA III project is the most efficient concerning improving the overall welfare of the beneficiaries, compared to the National program on Food Security (NPFS); and Community-Based Agricultural and Rural Development Program (CBARDP)/IFAD.

Contribution to Knowledge

Debate on promoting commercial and agricultural funding has been on the front burner of academic discussion and policy formulation. Therefore this study will not claim novelty. However, this research work is unique in certain areas.

1. To the best of the researcher's knowledge, this is the first known comprehensive study that decomposed the three uppermost funding sources in Yobe State, to understand (or "intending to") understand the interaction between their peculiarities and effectiveness.
2. Earlier studies relied entirely either on secondary data or primary data. However, this is the first study to combine survey and ex-post facto design on this topic. The study also interacted both variables to eliminate measurement error that may make the result spurious.
3. The study also discovered that donor funding for agricultural purposes might not be effective without the involvement of the government and the benefiting communities in the form of counterpart funding.

Suggestion for Further Studies

The findings of this study have exposed other areas of research that may optimize our understanding and policy on funding agricultural effectiveness in Nigeria.

1. The sample for the study is all beneficiaries of the three funding sources. These will mask some peculiarities like that of sectoral dependent. Thus, further studies along this could decompose the beneficiaries using similar characteristics such farm size, nature of agricultural activities, years of experience, among others. Such research will clarify our understanding of the role of the beneficiaries' characteristics in promoting funding effectiveness.
2. The results controlled for macroeconomic conditions using inflation rate, exchange rate, and corruption perception index, among others. Future studies could use macro-variables to understand the role of favorable or unfavorable macroeconomic environment on agricultural funding effectiveness. Such a study will be significant in recommending ideal policy environment that could promote the efficiency of agricultural funding.
3. The study used the beneficiaries of the fund as population sample. However, those farmers or citizens that did not benefit from the fund are equally important in understanding the role of agricultural funding in poverty alleviation. Further studies could investigate the inclusiveness or exclusiveness of the funding source, regarding sampling the non-beneficiaries of the fund, with the objective of understanding the factors responsible for their exclusion and how these factors could promote or hinder the goals of the funding.

4. The result assumes uni-directional relationship agricultural financing and the welfare effect of the beneficiaries. However, the effect of the funding could be a non-linear relationship. Future studies could use non-linear models to estimate the relationship. Such study will be a significant contribution to theory and body of knowledge since previous studies use assumes linearity between funding and welfare effect.

5. Although, further studies is being suggested, this research work has the potential to bring about a positive social change by contributing to poverty reduction, expanding economic opportunities and improving the quality of life of the people, leading ultimately to sustainable peace and economic prosperity in the region.

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Appendix A: Data Used for the Estimation of Ordinary Least Square (OLS) Regression

Data Used for the Estimation of Ordinary Least Square (OLS) Regression									
EXCHR _BDC $	INFR	STDL	CC	FUND CODE	AB	AGO	Income	TECH	AGRF
154.57	10.8	3229.915	354.2	1	80000	600000	40000	2.5	150000
153.13	13.39	3891.195	354.2	1	95000	250000	50000	2	300000
153.98	12.35	3442.428	354.2	1	30000	200000	30000	2.5	350000
153.85	11.69	2498.896	354.2	1	72000	600000	30000	2.5	150000
152.23	11.64	2486.01	354.2	1	50000	400000	40000	4	400000
152.41	12.42	3881.232	354.2	1	40000	250000	50000	4	250000
153.87	10.6	3710.311	265.65	1	100000	280000	75000	2.5	200000
153.26	13	2607.337	354.2	1	34000	225000	30000	4	150000
152	13.4	1061.669	354.2	1	45000	200000	30000	4	400000
151.85	13	1061.669	354.2	1	120000	200000	50000	4	350000
152.08	11.3	3338.821	177.1	1	52500	280000	50000	4	300000
153.55	10.4	3634.52	265.65	1	70000	240000	62500	4	250000
163.35	10.1	3098.319	244.05	1	35000	220000	37500	4	300000
160.35	10	2956.523	244.05	1	40000	100000	30000	5	200000
161.32	12.3	3376.584	244.05	1	80000	800000	30000	4	350000
158.26	12.2	3213.268	244.05	1	52000	180000	37500	4	400000
163.14	11.7	3328.936	244.05	1	72000	800000	37500	4	150000
163.71	10.3	3624.169	162.7	1	80000	200000	37500	4	200000
158.32	10.2	4783.734	325.4	1	160000	1050000	50000	5	350000
158.05	9.7	2012.924	325.4	1	64000	900000	40000	2.5	150000

157.05	9.9	3063.365	325.4	1	45000	350000	30000	5	200000
157.09	11.7	2987.556	162.7	1	5000	50000	50000	5	200000
155.11	11	3161.905	162.7	1	1400	12500	30000	4	300000
156.08	9.9	3115.329	325.4	1	18000	200000	80000	5	400000
159.26	14.3	3108.22	574	1	20000	100000	40000	5	250000
159.32	12.03	3325.353	574	1	18000	40000	37500	5	200000
159	14.47	3044.334	574	1	3750	7500	30000	5	200000
159.8	14.3	1624.826	574	1	4000	50000	30000	4	350000
162.24	14.5	2544.204	574	1	30000	160000	37500	5	400000
163.32	13.7	2527.651	574	1	1600	10000	30000	4	150000
163.43	13.8	2416.528	430.5	1	47000	350000	40000	5	300000
159.67	13.2	2714.849	287	1	14000	175000	60000	4	350000
159.37	12.2	2617.498	287	1	72000	600000	40000	5	250000
159.41	11.4	2396.838	287	1	54000	450000	30000	5	250000
160.85	12.3	3111.906	430.5	1	60000	300000	30000	4	200000
164.62	12.9	3262.241	430.5	1	9000	75000	40000	5	150000
171.4	8.59	2494.758	200.55	1	24500	160000	40000	5	350000
167.14	8.58	2411.97	300.825	1	18750	225000	40000	4	200000
165	6.3	2840.318	300.825	1	55000	375000	40000	4	150000
163.14	5.6	2535.74	300.825	1	31000	450000	40000	5	150000
162.28	4.1	2739.853	300.825	1	80000	900000	40000	4	400000
162.43	4.4	2808.046	200.55	1	60000	575000	40000	5	350000

160.98	6.3	3724.128	200.55	1	50000	500000	40000	5	300000
159.57	6.7	2959.806	200.55	1	80000	1200000	40000	5	200000
159.81	7.3	2980.282	300.825	1	75000	600000	50000	4	200000
160	7.6	3018.637	300.825	1	36000	450000	60000	4	250000
158.7	7.8	3716.342	300.825	1	60000	750000	50000	4	350000
159.12	8	2876.931	300.825	1	40000	375000	30000	5	300000
188.45	7.4	2718.605	225.6333	1	24000	225000	40000	5	250000
175.85	8	2726.537	338.45	1	170000	820000	75000	5	400000
169.43	6.7	4091.469	112.8167	1	50000	200000	37500	4	150000
168.64	7.6	4631.019	112.8167	1	100000	300000	50000	4	400000
170.36	8.6	4106.83	225.6333	1	85000	580000	75000	4	400000
167.71	9	4071.122	225.6333	1	138000	1450000	40000	5	300000
167.17	7.1	4645.825	225.6333	1	171250	1180000	62500	5	150000
166.85	6.6	5435.526	225.6333	1	94500	270000	40000	4	150000
170.25	6.2	3665.685	225.6333	1	107500	316000	37500	4	200000
171.5	6.3	3582.619	225.6333	1	44750	200000	50000	5	250000
169.45	6.3	3657.824	112.8167	1	25000	100000	37500	4	150000
154.57	10.8	3668.58	177.1	2	36000	150000	30000	5	250000
153.13	13.39	3744.383	265.65	2	48000	350000	40000	5	300000
153.98	12.35	4217.601	177.1	2	60000	300000	70000	4	200000
153.85	11.69	5727.398	177.1	2	22400	215000	30000	5	250000
152.23	11.64	4272.464	177.1	2	24000	240000	50000	5	150000

152.41	12.42	4304.77	265.65	2	50000	480000	62500	4	200000
153.87	10.6	4643.81	265.65	2	37500	200000	62500	4	250000
153.26	13	5551.657	265.65	2	30000	350000	50000	5	350000
152	13.4	4316.748	265.65	2	24000	200000	50000	5	300000
151.85	13	3868.458	265.65	2	37500	250000	30000	4	400000
152.08	11.3	5436.868	265.65	2	50000	320000	50000	4	250000
153.55	10.4	4055.183	354.2	2	90000	240000	37500	2	200000
163.35	10.1	2299.174	406.75	2	90000	400000	37500	4	350000
160.35	10	2299.174	406.75	2	50000	200000	62500	4	150000
161.32	12.3	3974.91	325.4	2	40000	200000	40000	4	150000
158.26	12.2	4056.276	244.05	2	50000	80000	50000	4	300000
158.32	10.2	5391.253	325.4	3	84000	700000	70000	4	400000
158.05	9.7	2299.174	325.4	3	32000	200000	40000	4	250000
157.05	9.9	2299.174	325.4	3	106250	480000	37500	4	200000
157.09	11.7	4077.215	325.4	3	45000	250000	50000	4	150000
155.11	11	4563.457	244.05	3	130000	520000	50000	4	250000
156.08	9.9	3291.017	325.4	3	152500	600000	50000	1.5	250000
159.26	14.3	3211.745	574	3	2000	10000	50000	2	200000
159.32	12.03	3132.473	430.5	3	27750	224000	75000	2	150000
159	14.47	3053.201	430.5	3	22200	224000	50000	2	200000
159.8	14.3	2973.928	430.5	3	17000	160000	37500	4	150000
162.24	14.5	2894.656	287	3	60000	600000	30000	5	150000

163.32	13.7	2815.384	287	3	56000	410000	50000	4	200000
163.43	13.8	2736.112	287	3	6000	100000	60000	5	350000
159.67	13.2	2656.839	287	3	60000	750000	50000	5	150000
159.37	12.2	2577.567	287	3	56000	700000	40000	5	150000

Sources: Field Survey, 2016

1 represents respondents that are beneficiaries of FADAMA 111 project; 2 represents respondents that are beneficiaries of National Program on Food Security (NPFS); and 3 represent respondents that are beneficiaries of Community-Based Agricultural and Rural Development Program (CBARDP)/IFAD.

Appendix B: Results of the OLS

Table B7

Agricultural Funding and Standard of Living (Hypothesis 1)

Dependent Variable: LOG_STDL

Method: Least Squares

Date: 08/18/16 Time: 11:09

Sample (adjusted): 4 90

Included observations: 87 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.006283	2.290816	2.621897	0.0104
LOG_AGRF(-3)	0.076408	0.095657	0.798771	0.4268
LOG_EXCHR	-1.323719	1.014646	-1.304611	0.1957
LOG_INFR	-0.193630	0.130721	-1.481241	0.1424
LOG_CORRUPTION	0.112081	0.114537	0.978557	0.3307
LOG_TECH	0.054374	0.137142	0.396477	0.6928

R-squared	0.047107	Mean dependent var	3.502782
Adjusted R-squared	-0.011713	S.D. dependent var	0.130160
S.E. of regression	0.130920	Akaike info criterion	-1.161988
Sum squared resid	1.388345	Schwarz criterion	-0.991925
Log likelihood	56.54647	Hannan-Quinn criter.	-1.093509
F-statistic	0.800860	Durbin-Watson stat	1.002144
Prob (F-statistic)	0.552292		

Table B8

Agricultural Funding and Asset-Base of the Beneficiaries (Hypothesis 2)

Dependent Variable: LOG_ASSET_BASE

Method: Least Squares

Date: 08/18/16 Time: 10:54

Sample (adjusted): 4 90

Included observations: 87 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.99398	6.834637	2.193823	0.0311
LOG_AGRF (-3)	0.400971	0.285392	1.404984	0.1638
LOG_EXCHR	-5.397798	3.027192	-1.783104	0.0783
LOG_INFR	-1.522973	0.390006	-3.904996	0.0002
LOG_CORRUPTION	0.686288	0.341721	2.008329	0.0479
LOG_TECH	-0.205851	0.409163	-0.503103	0.6163

R-squared	0.209965	Mean dependent var	4.598896
Adjusted R-squared	0.161198	S.D. dependent var	0.426483
S.E. of regression	0.390599	Akaike info criterion	1.024203
Sum squared resid	12.35799	Schwarz criterion	1.194266
Log likelihood	-38.55283	Hannan-Quinn criter.	1.092682
F-statistic	4.305433	Durbin-Watson stat	1.622742
Prob (F-statistic)	0.001595		

Table B11

Agricultural Funding and Income of the Beneficiaries (Hypothesis 3)

Dependent Variable: LOG_INCOME

Method: Least Squares

Date: 08/18/16 Time: 11:00

Sample (adjusted): 4 90

Included observations: 87 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.175171	2.052359	2.521572	0.0136
LOG_AGRF(-3)	0.021051	0.085700	0.245639	0.8066
LOG_EXCHR	-0.230386	0.909029	-0.253442	0.8006
LOG_INFR	-0.093957	0.117114	-0.802272	0.4247
LOG_CORRUPTION	0.046132	0.102615	0.449568	0.6542
LOG_TECH	-0.192015	0.122867	-1.562790	0.1220

R-squared	0.041254	Mean dependent var	4.635661
Adjusted R-squared	-0.017928	S.D. dependent var	0.116255
S.E. of regression	0.117292	Akaike info criterion	-1.381824
Sum squared resid	1.114355	Schwarz criterion	-1.211762
Log likelihood	66.10936	Hannan-Quinn criter.	-1.313345
F-statistic	0.697073	Durbin-Watson stat	1.890512
Prob(F-statistic)	0.627176		

Table B14

Agricultural Funding and Agricultural Output (Hypothesis 4)

Dependent Variable: LOG_OUTPUT

Method: Least Squares

Date: 08/18/16 Time: 11:04

Sample (adjusted): 4 90

Included observations: 87 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.72552	7.320674	2.421296	0.0177
LOG_AGRF (-3)	0.030682	0.305687	0.100369	0.9203
LOG_EXCHR	-5.090500	3.242467	-1.569947	0.1203
LOG_INFR	-1.599078	0.417741	-3.827918	0.0003
LOG_CORRUPTION	0.386064	0.366022	1.054755	0.2947
LOG_TECH	0.191078	0.438260	0.435993	0.6640

R-squared	0.165974	Mean dependent var	5.408863
Adjusted R-squared	0.114490	S.D. dependent var	0.444601
S.E. of regression	0.418376	Akaike info criterion	1.161601
Sum squared resid	14.17813	Schwarz criterion	1.331663
Log likelihood	-44.52964	Hannan-Quinn criter.	1.230080
F-statistic	3.223844	Durbin-Watson stat	1.522097
Prob(F-statistic)	0.010505		

Appendix C: Decomposed Results Based on Funding Sources

Fadama lll Project

Table C7

Agricultural Funding (AGRF) and Standard of Living (STDL)

Dependent Variable: LOG (STDL)

Method: Least Squares

Date: 09/05/16 Time: 17:50

Sample: 1 59

Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.076422	1.720805	5.274521	0.0000
LOG (AGRF)-2)	0.421985	0.104938	1.162451	0.0003
EXCHR_BDCDOL				
LAR	-0.004910	-0.006561	-0.748286	0.0076
INFR	-0.010176	0.018681	-0.544739	0.0882
CC	-0.000662	0.000403	-1.644238	0.0060
TECH	0.008738	0.051190	-0.170697	0.8651

R-squared	0.184021	Mean dependent var	8.012151
Adjusted R-squared	0.107042	S.D. dependent var	0.290485
S.E. of regression	0.274498	Akaike info criterion	0.348397
Sum squared resid	3.993498	Schwarz criterion	0.559672
Log likelihood	-4.277711	Hannan-Quinn criter.	0.430870
F-statistic	2.390529	Durbin-Watson stat	1.346511
Prob(F-statistic)	0.049912		

Table C8

Agricultural Funding (AGRF) and Asset-Base (AB)

Dependent Variable: LOG (ASSET_BASE)

Method: Least Squares

Date: 09/05/16 Time: 17:51

Sample: 1 59

Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.468691	5.958700	1.589053	0.1180
LOG((AGRF)-2)	0.459932	0.363373	1.265730	0.2111
EXCHR_BDCDOL				
LAR	-0.010366	0.022721	-0.456225	0.6501
INFR	-0.136527	0.064686	-2.110623	0.0395
CC	-0.001290	0.001395	-0.925096	0.3591
TECH	-0.267152	0.177258	-1.507137	0.1377

R-squared	0.233587	Mean dependent var	10.60929
Adjusted R-squared	0.161284	S.D. dependent var	1.037889
S.E. of regression	0.950514	Akaike info criterion	2.832517
Sum squared resid	47.88431	Schwarz criterion	3.043792
Log likelihood	-77.55926	Hannan-Quinn criter.	2.914990
F-statistic	3.230658	Durbin-Watson stat	1.526339
Prob(F-statistic)	0.012801		

Table C14

Agricultural Funding (AGRF) and Income (INCOME)

Dependent Variable: LOG(INCOME)

Method: Least Squares

Date: 09/05/16 Time: 17:53

Sample: 1 59

Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.401371	1.601651	5.245446	0.0000
LOG((AGRF)-2)	0.202420	0.097672	2.072456	0.0431
EXCHR_BDCDOL				
LAR	0.000687	0.006107	0.112503	0.9108
INFR	-0.021393	0.017387	-1.230406	0.2240
CC	-0.000184	0.000375	-0.489822	0.6263
TECH	-0.029699	0.047646	-0.623337	0.5357

R-squared	0.140596	Mean dependent var	10.62893
Adjusted R-squared	0.059520	S.D. dependent var	0.263451
S.E. of regression	0.255491	Akaike info criterion	0.204882
Sum squared resid	3.459598	Schwarz criterion	0.416157
Log likelihood	-0.044015	Hannan-Quinn criter.	0.287355
F-statistic	1.734124	Durbin-Watson stat	2.006812
Prob (F-statistic)	0.142868		

Table C14

Agricultural Funding (AGRF) and Agricultural Output (AGO)

Dependent Variable: LOG (AGO)

Method: Least Squares

Date: 09/05/16 Time: 17:54

Sample: 1 59

Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.25329	6.131218	1.998509	0.0508
LOG((AGRF)-2)	0.536895	0.373893	1.435958	0.1569
EXCHR_BDCDOL				
LAR	-0.021212	0.023378	-0.907353	0.3683
INFR	-0.196525	0.066559	-2.952665	0.0047
CC	-0.000906	0.001435	-0.631413	0.5305
TECH	-0.186500	0.182390	-1.022533	0.3112

R-squared	0.282566	Mean dependent var	12.45680
Adjusted R-squared	0.214884	S.D. dependent var	1.103791
S.E. of regression	0.978034	Akaike info criterion	2.889599
Sum squared resid	50.69715	Schwarz criterion	3.100874
Log likelihood	-79.24317	Hannan-Quinn criter.	2.972072
F-statistic	4.174883	Durbin-Watson stat	1.560221
Prob(F-statistic)	0.002849		

National Program Food Security (NPFS)

Table C7

Agricultural Funding (AGRF) and Standard of Living (STDL)

Dependent Variable: LOG (STDL)

Method: Least Squares

Date: 09/08/16 Time: 14:05

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.32627	3.909606	3.152818	0.0103
LOG((AGRF)-2)	0.009788	0.178475	0.054841	0.9573
EXCHR_BDC	-0.025463	0.019910	-1.278904	0.2298
INFR	0.042562	0.056450	0.753975	0.4682
CC	-0.001587	0.001075	-1.475608	0.1708
TECH	-0.064160	0.087156	-0.736151	0.4786

R-squared	0.610700	Mean dependent var	8.302759
Adjusted R-squared	0.416049	S.D. dependent var	0.257754
S.E. of regression	0.196967	Akaike info criterion	-0.131562
Sum squared resid	0.387961	Schwarz criterion	0.158159
Log likelihood	7.052496	Hannan-Quinn criter.	-0.116726
F-statistic	3.137421	Durbin-Watson stat	2.113839
Prob(F-statistic)	0.058387		

Agricultural Funding (AGRF) and Asset-Base (AB)

Dependent Variable: LOG(AB)

Method: Least Squares

Date: 09/08/16 Time: 14:06

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.778462	5.528657	0.683432	0.5099
LOG((AGRF)-2)	0.280752	0.252385	1.112393	0.2920
EXCHR_BDC	0.033552	0.028155	1.191656	0.2609

INFR	-0.017743	0.079828	-0.222268	0.8286
CC	0.000140	0.001521	0.092090	0.9284
TECH	-0.383617	0.123249	-3.112547	0.0110

R-squared	0.703028	Mean dependent var	10.65780
Adjusted R-squared	0.554542	S.D. dependent var	0.417328
S.E. of regression	0.278536	Akaike info criterion	0.561455
Sum squared resid	0.775821	Schwarz criterion	0.851176
Log likelihood	1.508361	Hannan-Quinn criter.	0.576291
F-statistic	4.734648	Durbin-Watson stat	1.676089
Prob(F-statistic)	0.017708		

Agricultural Funding (AGRF) and Income (Income)

Dependent Variable: LOG (INCOME)

Method: Least Squares

Date: 09/08/16 Time: 14:07

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.24514	6.084822	2.834123	0.0177
LOG((AGRF)-2)	-0.409142	0.277774	-1.472928	0.1715
EXCHR_BDC	-0.014180	0.030988	-0.457603	0.6570
INFR	0.038637	0.087858	0.439772	0.6695
CC	0.000911	0.001674	0.544130	0.5983
TECH	0.011204	0.135647	0.082595	0.9358

R-squared	0.190360	Mean dependent var	10.72301

Adjusted R-squared	-0.214459	S.D. dependent var	0.278175
S.E. of regression	0.306555	Akaike info criterion	0.753160
Sum squared resid	0.939762	Schwarz criterion	1.042881
Log likelihood	-0.025279	Hannan-Quinn criter.	0.767996
F-statistic	0.470235	Durbin-Watson stat	2.260357
Prob(F-statistic)	0.790477		

Agricultural Funding (AGRF) and Output (AGO)

Dependent Variable: LOG (AGO)

Method: Least Squares

Date: 09/08/16 Time: 14:03

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.48940	8.960631	2.509801	0.0309
LOG((AGRF)-2)	-0.108685	0.409056	-0.265697	0.7959
EXCHR_BDC	-0.068904	0.045633	-1.509941	0.1620
INFR	0.019512	0.129381	0.150810	0.8831
CC	0.004122	0.002465	1.672339	0.1254
TECH	0.139787	0.199756	0.699788	0.5000

R-squared	0.254193	Mean dependent var	12.39479

Adjusted R-squared	-0.118710	S.D. dependent var	0.426816
S.E. of regression	0.451440	Akaike info criterion	1.527246
Sum squared resid	2.037978	Schwarz criterion	1.816967
Log likelihood	-6.217970	Hannan-Quinn criter.	1.542082
F-statistic	0.681660	Durbin-Watson stat	2.109153
Prob(F-statistic)	0.647774		

Community-Based Agricultural and Rural Development Program (CBARDP)

International Funds for Agricultural Development (IFAD)

Table C7

Agricultural Funding (AGRF) and Standard of Living (STDL)

Dependent Variable: LOG (STDL)

Method: Least Squares

Date: 09/08/16 Time: 14:11

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.78792	5.078090	2.518254	0.0305
LOG((AGRF)-2)	0.359487	0.213794	1.681463	0.1236
EXCHR_BDC	-0.061717	0.034622	-1.782586	0.1050
INFR	0.067526	0.055347	1.220064	0.2504
CC	-0.000293	0.001100	-0.266001	0.7956
TECH	-0.015156	0.078406	-0.193298	0.8506

R-squared	0.378034	Mean dependent var	8.051978
Adjusted R-squared	0.067050	S.D. dependent var	0.235159
S.E. of regression	0.227139	Akaike info criterion	0.153483
Sum squared resid	0.515919	Schwarz criterion	0.443204
Log likelihood	4.772136	Hannan-Quinn criter.	0.168319
F-statistic	1.215608	Durbin-Watson stat	2.555804
Prob(F-statistic)	0.369410		

Agricultural Funding (AGRF) and Asset-Base (AB)

Dependent Variable: LOG(AB)

Method: Least Squares

Date: 09/08/16 Time: 14:12

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.14673	16.64549	1.510723	0.1618
LOG((AGRF)-2)	-1.431814	0.700797	-2.043122	0.0683
EXCHR_BDC	0.074857	0.113489	0.659598	0.5244
INFR	-0.319325	0.181421	-1.760132	0.1089
CC	-0.010499	0.003605	-2.912094	0.0155
TECH	-0.419526	0.257009	-1.632344	0.1337

R-squared	0.708427	Mean dependent var	10.52201
Adjusted R-squared	0.562641	S.D. dependent var	1.125817
S.E. of regression	0.744538	Akaike info criterion	2.527891
Sum squared resid	5.543371	Schwarz criterion	2.817612
Log likelihood	-14.22313	Hannan-Quinn criter.	2.542727

F-statistic	4.859353	Durbin-Watson stat	2.620398
Prob(F-statistic)	0.016300		

Agricultural Funding (AGRF) and Income (INCOME)

Dependent Variable: LOG(INCOME)

Method: Least Squares

Date: 09/08/16 Time: 14:10

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.044932	5.475712	0.190830	0.8525
LOG((AGRF)-2)	0.200937	0.230535	1.001743	0.3401
EXCHR_BDC	0.048357	0.037333	1.295290	0.2243
INFR	-0.041775	0.059680	-0.699985	0.4999
CC	0.000263	0.001186	0.221597	0.8291
TECH	-0.100150	0.084546	-1.184568	0.2636

R-squared	0.411646	Mean dependent var	10.74984
Adjusted R-squared	0.117469	S.D. dependent var	0.260715
S.E. of regression	0.244924	Akaike info criterion	0.304257
Sum squared resid	0.599877	Schwarz criterion	0.593978
Log likelihood	3.565944	Hannan-Quinn criter.	0.319093
F-statistic	1.399313	Durbin-Watson stat	2.012810
Prob(F-statistic)	0.303850		

Agricultural Funding (AGRF) and Output (AGO)

Dependent Variable: LOG(AGO)

Method: Least Squares

Date: 09/08/16 Time: 14:13

Sample: 1 16

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.659532	18.91636	0.510644	0.6207
LOG((AGRF)-2)	-1.410621	0.796404	-1.771238	0.1069
EXCHR_BDC	0.176852	0.128972	1.371251	0.2003
INFR	-0.286556	0.206171	-1.389893	0.1947
CC	-0.010004	0.004097	-2.441791	0.0347
TECH	-0.301873	0.292071	-1.033560	0.3257

R-squared	0.595609	Mean dependent var	12.50754
Adjusted R-squared	0.393414	S.D. dependent var	1.086380
S.E. of regression	0.846112	Akaike info criterion	2.783667
Sum squared resid	7.159061	Schwarz criterion	3.073388
Log likelihood	-16.26934	Hannan-Quinn criter.	2.798503
F-statistic	2.945710	Durbin-Watson stat	2.457359
Prob (F-statistic)	0.068672		

Appendix D: Survey Instrument

The Effectiveness of Funding Sources on Agricultural Projects in Yobe State, Nigeria

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