

The Role of Market-driven Initiatives and Support for Rural Poverty Alleviation

A Case Study of the AgResults Program in Developing Agribusiness in Nigeria

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Statement of Original Work

I declare the following:

This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

Where another author's ideas have been presented in this applied dissertation, I have acknowledged the author's ideas by citing them in the required style.

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February 2021

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List of Abbreviation and Acronyms

| | |
|-------|---|
| AC | Advisory Council |
| AfDB | African Development Bank |
| AGRA | Green Revolution in Africa |
| ANOVA | Analysis of Variance |
| ATA | Agricultural Transformation Agenda |
| BLP | Better Life Program |
| CAADP | Comprehensive Africa Agricultural Development Program |
| CBN | Central Bank of Nigeria |
| CSR | Corporate Social Responsibility |
| DBA | Doctor of Business Administration |
| DFFRI | Directorate of Foods, Roads and Rural Infrastructure |
| DNA | Deoxyribonucleic acid |
| Dr | Doctor (of Philosophy) |
| EU | European Union |
| FAO | Food and Agriculture Organization |
| FDI | Foreign Direct Investment |
| FGN | Federal Government of Nigeria |
| FMARD | Federal Ministry of Agriculture and Rural Development |
| FOS | Federal Office of Statistics |
| G20 | Group of 20 Nations |
| GAP | Good Agronomic Practices |
| GDP | Gross Domestic Product |
| GLS | Generalized Least Square |
| GPS | Global Positioning System |
| GRP | Green Revolution Program |
| Ha | Hectare |
| HDI | Human Development Index |
| HNLSS | Harmonized Nigeria Living Standard Survey |
| HYVs | High-yielding Varieties |
| IBM | Inclusive Business Model |
| IBMs | Inclusive Business Models |

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| IFAD | International Fund for Agricultural Development |
| IFPRI | International Food Policy Research Institute |
| IITA | International Institute of Tropical Agriculture |
| IMF | International Monetary Fund |
| IP | Innovation Platform |
| Kg | Kilogram |
| LDCs | Least Developed Countries |
| LLP | Limited Liability Partnership |
| LOA | Letter of Agreement |
| MDG | Millennium Development Goal |
| MDGs | Millennium Development Goals |
| MPI | Multidimensional Poverty Index |
| Mt | Metric Ton |
| NAFPP | National Accelerated Food Production Program |
| NAPEP | National Poverty Eradication Program |
| NBS | National Bureau of Statistics |
| NEEDS | National Economic Empowerment and Development Strategies |
| NEPAD | New Partnership for Africa's Development |
| NGN | Nigeria Naira |
| NGO | Nongovernmental Organization |
| NPC | Nigeria Population Commission |
| OECD | Organisation for Economic Co-operation and Development |
| OLS | Ordinary Least Squares |
| OPFN | Operation Feed the Nation |
| Ph.D | Doctor of Philosophy |
| PMU | Project Management Unit |
| PPP | Public-Private Partnerships |
| RBDAs | River Basin Development Authorities |
| SAP | Structural Adjustment Program |
| SC | Steering Committee |
| SCP | Structure-Conduct-Performance |
| SDG | Sustainable Development Goal |

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| SDGs | Sustainable Development Goals |
| SOEs | State-Owned Enterprises |
| SPSS | Statistical Package for Social Sciences |
| SSA | Sub-Saharan Africa |
| SV | Shared Valued |
| TM | Trade Mark |
| UN | United Nations |
| UNCTAD | United Nations Conference on Trade and Development |
| UNDESA | United Nations Department of Economic and Social Affairs |
| UNDP | United Nations Development Program |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNGA | United Nations General Assembly |
| UNICEF | United Nations Children's Fund |
| USA | United States of America |
| USAID | United States Agency for International Development |
| US\$ | United States Dollar |
| USDA | United States Department of Agriculture |
| VCG | Vegetative Compatible Grouping |
| WB | World Bank |

Abstract

The connection between persistence rural poverty in the developing nations, agricultural-related structural problems have been debated extensively in the literature. Surmounting both challenges of the extensive rural poverty in the developing countries and particularly in sub-Saharan Africa (SSA) and how agriculture system can be supported to the reduce rural poverty has been a daunting task for governments (Ajulor, 2013; Tersoo, 2013). Discourse on the role of market-driven agricultural approach through Agribusiness enterprises as a means to reduce the structural problems in agricultural that are linked to rural poverty alleviation is also emerging (Dorward et al. 2009; Suttie 2019). Recently, several Agri-business models have sought to fill the structural agricultural vacuum by developing new systems of support through private enterprises for the smallholder rural poor. One of this new initiative is the AgResults Global initiative aimed at attracting involvement of the agribusiness private enterprises to address key structural agricultural problems, aimed at increasing smallholder farmers income (AgResults Initiative 2018).

This research is based on the case study of the AgResults Global initiative in developing agribusiness in Nigeria; a country with high indicators of high rural poverty and major structural agricultural problems. The objective of the research is to understand the theoretical and empirical effectiveness of the AgResults model in enhancing structural support for rural development and poverty alleviation. It aims to examine the effectiveness of an AgResults market-based development program of agribusiness and to understand the extent to which private sector-managed initiatives in market-driven agriculture alleviate the structural agriculture problems and rural poverty. It assesses the extent to which the new, private-sector mechanism of support for rural poor farmers could support an increase in agricultural productivity, income, and diversification in food consumption in Nigeria as part of the rural poverty alleviation. The study uses a combination of survey and semi-structured interviews to generate primary data. The research sample consisted of 170 smallholder farmers, one hundred and four smallholder farmers for the treated group who were supported by the implementers of the AgResults project and 66 smallholder farmers as control groups who were not supported on the project but had similar characteristics to the treated groups that were working on the pproject.

The research shows that smallholder farmers can increase their output and income where timely and consistent support for the crucial structural problems of agriculture is available. The research further showed that smallholding farming in a business managed environment contrast to the fragmented smallholder farmers system that are not operating under such condition could experience an increase in their output and substantial profitability in their

agribusiness. Overall the results showed that Agresults Agribusiness model created an ecosystem that brings together most of the critical structural solution to strengthen the smallholder farmers participation in a market-oriented agricultural system. Through the fundamental agribusiness skills support gained by the smallholder farmers they were able to access quality-sensitive premium markets , increased their revenue and grow their businesses from subsistence to one with a market-driven objective . The smallholder farmers have further attributed the increase in the income to the diversification in their consumption pattern towards a healthier diet.

Keywords: Agribusiness, AgResults, Market-driven, Supply driven, Implementer

Chapter 1: Introduction

1.1 Background of the Problem

Agriculture is one of the most crucial economical sector that could be harnessed for poverty alleviation . Growth in the agricultural sector is two to four times more effective at increasing incomes amongst the poorest, compared to other sectors (World Bank, 2020). The potential of agriculture to reduce poverty has, however not been harnessed properly. This is particularly the case in developing regions with a high prevalence of poverty and dense rural populations. These communities depend on agriculture for their livelihoods (World Bank, 2018). Poverty impacts on both rural and urban areas (IFAD, 2011), however, the effect of poverty is more prevalent in rural areas in most developing countries (Suttie, 2019).

The issue of rural poverty, and its alleviation has created intense debate amongst scholars and practitioners. The interrelationship between rural poverty and agriculture has also been discussed extensively (IFPRI 2007; Igbalajobi et al 2013; John 2018). Several structural constraints to the ability of the agricultural sector to support rural poverty alleviation have been identified in different literatures (Lee et al. 2009; De La O Campos et al. 2018) . These constraints underscore how agricultural systems can be developed to increase the income and productivity of smallholder farmers to reduce rural poverty. This process has been a daunting task for the governments of many developing countries (Ajulor 2013; Tersoo 2013; Beegle and Christiaensen 2019).

In achieving support for the alleviation of rural poverty through agriculture, most countries in the developing world (particularly after gaining independence) have adopted a state-led approach to agricultural practices and rural development (ODI 2006, 16). Under state-led agriculture and rural development, government has provided various kinds of support, which include price interventions through subsidies, output price stabilization and infrastructural support. Other organizational interventions have been introduced by parastatal, state-sponsored cooperative and agricultural finance organizations and extension services (Dorward et al. 2009; FAO 2017), in a bid to tackle some of the structural problems faced by agriculture.

Most of these government supported stated-led policies, however, collapsed in the early 1980s when Structural Adjustment Programs (SAP) were adopted to expedite overall development. These SAPs include agriculture and rural development in most developing nations (Veeman 2012 16), and the governments of these countries have tended to reduce public expenditure and support for public services. The shift in policy and practice under SAP has created a substantial institutional and infrastructural support gap for agriculture, and most notably in developing countries (de Janvry 2010, 32).

Discourse on the role of market-driven agriculture through agribusiness enterprises has emerged in national and international fora, because of the perceived role it can play in easing the structural problems associated with rural, agricultural poverty (Lahif et al. 2007; Dorward et al. 2009; Nigeria Zero Hunger Report 2016).

Several agri-business initiatives have sought to fill that gap by developing new systems of support through private enterprises. In the past, few private enterprises have been engaged in agricultural development in developing countries and, where they have participated, their participation has been limited to the downstream of the agricultural value chain that primarily focuses on the processing and marketing of processed agricultural products. Occasionally, the private sector has also become engaged in the agricultural sector as part of wider Corporate Social Responsibility (CSR) efforts. These are primarily philanthropic gestures rather than core business efforts (Lucci 2012, 5).

Our theoretical and empirical understanding of the effectiveness of market driven initiatives as a means to enhance structural support for rural development and poverty alleviation is, however, not robust. There is little understanding of how such initiatives can increase productivity and income to tackle agrarian poverty in developing countries (Boateng 2011,1; Kumar et al. 2012). Modern agricultural practices, however, require a better understanding of how best agribusiness can support agricultural productivity, especially in the context of developing countries (Suttie 2019).

The gap in our understanding of the role of agribusiness support in market-driven agricultural initiatives, and particularly support to increase productivity and the incomes of smallholder farmers necessitates more attention through research. This study contributes to practice in agricultural and rural development management and generates knowledge that will bridge the gaps in knowledge that exist in terms of the role of agribusiness in developing a new system to support smallholder farmers. The research underscores how this can effectively improve productivity and increase rural income in support of poverty reduction in Nigeria.

Achieving the required results necessitates adopting acceptable scholarly approaches through research by designing a research methodology that will guide the enquiry. This research is based on a case study of the AgResults Initiative in Nigeria. It adopts a multimethod approach to research (Webb et al. 1966; Bryman 1992; Hunter and Brewer 2016) based on qualitative and quantitative methods.

1.2. Research Motivation

Based on the discussion above, the following issues embody the motivation behind this research:

- I. The persistence of poverty, particularly rural poverty, in developing countries, and specifically in Nigeria; a country with the highest number of poor people in the world (Brooking Report 2018).
- II. The structural constraints that have inhibited the potential of smallholder rural farmers to harness resources in the agricultural sector to increase production rates and income (Ajulor 2013; Cheru and Modi 2013). These justify a different approach to tackling the constraints.
- III. The opportunities that may exist through the growing demand for food quantities and quality have spurred increased agricultural research to identify innovative ideas that can support sustainable agricultural productivity while ensuring income security for agricultural producers (Kumar et al. 2012; FAO 2015; Christiaensen 2017).

1.3. Aim and Objectives

The study seeks to contribute to knowledge and understanding in terms of the role of agribusiness support through market-driven agricultural initiatives to increase productivity and the income of smallholder farmers to reduce rural poverty. This is achieved by (i) examining the effectiveness of a AgResults market-based development program of agribusiness and (ii) by examining the extent to which private sector-managed initiatives in market-driven agriculture can alleviate the structural problems associated with agriculture. These contribute to rural poverty reduction and are therefore important. It assesses the extent to which a new private-sector mechanism of support for poor rural farmers could elicit an increase in agricultural productivity and income and could diversify food consumption in Nigeria as part of efforts aimed at rural poverty alleviation.

1.4. Research Questions

This research aims to answer the following research questions:

- I. To what extent do AgResults implementers, generally known as agricultural enterprises, contribute to an increase in the agricultural income of smallholder farmers through support for agricultural production?
- II. What mechanisms could enhance and sustain the contribution of the AgResults implementers to support a long-term change in the incomes of smallholder farmers to address poverty alleviation?
- III. How does a change in the income of farmers resulting from agribusiness support impact on the consumption patterns of rural, poor smallholder farmers?

1.5. Research Methodology

The study uses a multimethod approach to explore the research questions identified above (Dezin 1978; Bryman 1992; Hunter and Brewer 2016). A combination of survey and semi-structured interviews were used to generate primary data that can offer insights into the processes through which agribusiness contributes to poverty alleviation. The fundamental objective of the survey was to collect data through self-administered questionnaires and interviews to answer the research questions.

The research sample consisted of 170 smallholder farmers comprising of one hundred and four smallholder farmers. The one hundred and four smallholder farmers are the ‘treated’ group who were sampled before and after the intervention, and who were supported by the implementers of the AgResults project as the target group. The other 66 smallholder farmers are the smallholder farmers not supported by the project, but who had similar characteristics to the first group. The latter cohort was therefore considered to be a control group. The study area consisted of three (Northwest, North Central, and Southwest) of the six geopolitical regions in Nigeria.

Secondary data sources comprised of reviews of published literature and several project reports, including reports from the Project Management Unit and the external project evaluator.

1.6. Organization of the Dissertation

The thesis is divided into Eight chapters. This introductory chapter (Chapter 1) presents a background to the research and sets out its relevance. It justifies the need for the research, highlights the research problem and research questions, and describes the objectives of the study as well as the methods adopted. Lastly, it sets the direction of the entire thesis, describing briefly, the content of the ensuing chapters.

Chapter 2 identifies early approaches to poverty reduction and examines its several dimensions. It specifically explains rural poverty and its diverse characteristics and explores the structural causes of rural poverty in a global context. It finally examines empirical data on rural poverty trends over three decades.

Chapter 3 examines agricultural development approaches and support systems from a historical context. Agriculture is central to rural development in Nigeria, and agrarian activities contribute 40 percent to Gross Domestic Product (GDP). The sector employs over 70 percent of Nigerians (African Economic Outlook 2014). Hence agriculture could be instrumental in rural poverty reduction.

Discussion in this chapter covers the key aspects of agriculture developments, especially state-led and market-led approaches in the developing world, and particularly sub-Saharan Africa (SSA). Subsistence farming that permeates developing countries, particularly those in the SSA is also discussed together with the associated implications for production in the market. The chapter summarises efforts that have been made to transit the agricultural sector from subsistence production to production for the market by exploring the factors that determine production for the market. As part of an overall approach to market production, it examines the development of the agribusiness model in agricultural practices in developing regions, and specifically in Nigeria.

Chapter 4 discusses rural poverty in Nigeria and explores the relevant factors that could contribute to poverty. In doing so, it examines diverse approaches to poverty measurements and analysis specific to the Nigerian context. It explores the geographical distribution of poverty in Nigeria and its implications for overall aggregated rural poverty. It also explores the gender dimension, and the urban-rural nexus of poverty in Nigeria. It examines the economic growth and poverty paradox in Nigeria.

It also explores past interventions in Nigeria spanning the period of pre-independence to the present day to reduce rural poverty. Policies, strategies, and programmes have been put in place to address poverty in Nigeria and these focused strongly on the alleviation of rural poverty. Nevertheless, most policies have been public sector driven and have been limited in their scope to traditional agricultural practices. They have had little impact on rural poverty (Tersoo 2013; Ajulor 2013). Finally, the chapter examines the role of agriculture in addressing rural poverty, and it looks at the structural constraints associated with agricultural practices in Nigeria. It examines the implications of these for the dominant subsistence practices in Nigeria.

Chapter 5 presents a case study of the AgResults model as a market-driven approach in Nigeria. The chapter provides a comparative analysis of agribusiness in the past and the present. It explores various divergent approaches and the role of the private sector in agribusiness. It investigates the role agribusiness could play in addressing some of the hitherto neglected structural constraints smallholder farmers have faced in attempting to engage in agricultural value chains competitively. It examines how many of the risks associated with smallholder farming might be reduced. It further outlines the challenges encountered by agribusiness in recent times (Tersoo, 2013). It explains innovation in AgResults, and the operation and implementation of this initiative in Nigeria. It explores how the model has been used to support the private sector in the development of agribusiness. It delineates the impact of the AgResults Pilot Initiative on various structural constraints using empirical results from

the pilot implementation. It finally highlights the strengths and weaknesses of the model and identifies the lessons learned from its implementation.

Chapter 6 outlines the research methodology and design, and it justifies the research method. It explains the use of a multimethod approach from a theoretical perspective, and it summarises the data analytical procedures that were carried out to offer insights into the ways in which agribusiness contributes to poverty alleviation. It explains the methods and process of primary data collection through the use of questionnaires and semi-structured interviews. The research target samples comprise of smallholder farmers working on the AgResults project, and smallholder farmers not working on the project. Both cohorts share similar characteristics, so the latter is included as a comparison or control group.

In addition, it highlights the study area, which consists of three geopolitical regions in Nigeria (Northwest, North Central, and Southwest) and provides a rationale for the choice of these regions. It sources secondary data from reviews of past literature and project implementation, as well as external project evaluator reports. A conceptual framework is proposed and discussed, and the chapter identifies how it could be applied and mapped into future studies to demonstrate the plausibility of the framework.

Chapter 7 presents an analysis, and a discussion of the results. The key features of the data collected were described using basic descriptive statistics (means and measures of frequency). Ordinary Least Squares regression (OLS), commonly called linear regression were used to investigate the bivariate and multivariate relationships between variables.

Lastly, Chapter 8, the concluding chapter, summarizes the thesis. The novelty of the research and its contribution to both research and practice are summarized. It provides practice recommendations and highlights the limitations of the research. The chapter also identifies opportunities for further research.

Chapter 2: Causes of Rural Poverty and Trends in the Developing Countries

Poverty can have a devastating effect on people (Anger, 2010). Although a global problem, it is more pervasive in developing countries, and particularly in sub-Saharan Africa which has a 41% average poverty rate compared to other regions that were below 13% in 2015 (WB 2018). If the trend is not reversed, by 2030, the share of extreme poor living in sub-Saharan Africa could be as large as 87% (WB 2018).

Understanding poverty requires a better understanding of its definition and its categorisation. Nyasalu (2010, 14) identified broad categorizations which fit many of the different definitions given by scholars. These broad categorizations include statistical definitions, income-based definitions, living standard definitions, political definitions, capabilities definitions, and social definitions (Sanders 2004; Noble et al. 2004; World Bank 2003 and UNDP-HDR 2005). Of all the several categorizations, there are some more prominent approaches to defining poverty (Wong 2012, 3). One of these is based on a definition about the absolute, relative, and multidimensional nature of poverty. Others have also viewed poverty from both urban and rural perspectives.

As earlier noted, poverty has many faces, and should thus be disaggregated to understand how it affects people in different areas at various times. In the IFAD Report (2011, 46), it was noted that one of the key considerations in understanding poverty was to be able to disaggregate it as a rural and an urban phenomenon. Regardless of how poverty is defined, it is accepted that poverty prevalence is higher in rural than urban areas in most developing countries, and most notably in sub-Saharan Africa (Suttie 2019). More recent data show that in SSA, more than 60 percent of the rural population still lives on US\$1.25 a day, and almost 90 percent live on US\$2 a day (IFAD 2011).

The high rate of rural poverty in developing countries, and particularly in SSA, necessitates greater attention to research and intervention. This chapter focuses on poverty in general and rural poverty in particular and explores the constraints that may prevent its alleviation, particularly in the context of developing countries. Finally, past interventions for agricultural developments are examined.

2.1 Understanding Poverty

To understand what will help to reduce poverty, what works and does not work, it is essential to define what is regarded as poverty, and also to put parameters in place to measure it (Juanah 2005).

An early conceptual approach defined poverty quite narrowly and based on household income or consumption (Townsend 1979) as a lack of income to meet necessity (Bradshaw 2007).

Defining poverty by income alone does not correlate with trends in basic variables such as child mortality, primary school completion, or undernourishment (Bourguignon et al. 2010, 24). This limitation to the income-based definition led to criticisms by scholars who argued for a more multidimensional approach to poverty (Wong 2012, 3). Understanding poverty as a multidimensional problem is necessary “to understand the threat that the problem of poverty poses and the process through which it seems to be deepened” (Bourguignon and Chakravarty 2003, 25).

Overall, it is best to understand poverty as a multidimensional issue, through the “well-being of a population which depends on both monetary and non-monetary variables” (Bourguignon and Chakravarty 2003). A person or household can be income-poor but multidimensional non-poor, or income rich in terms of multidimensional poverty (OPHI 2014). The multidimensionality of poverty is what has become known as MDGs (Cobbinah et al. 2013). MDGs combine the economic side of poverty (i.e. an individual living on less than US\$1.25 and US\$2 per day) and other socio-cultural indicators of poverty (UN 2000, Jamieson and Nadkarni 2009, Sumner 2010).

According to Sindzingre (2005), poverty should be viewed as subjective and objective, relative and absolute, monetary and non-monetary. Creating a further robust definition of poverty requires understanding processes that may be required to analyse “...the context in which poverty analysis has to be carried out, and the specific goals of the poverty analysis (such as choosing the time and space dimension of the analysis, identifying likely welfare-sensitive items, selecting sensitive welfare-sensitive items” (Bellu et al. 2005, 7).

In examining the “science of poverty”, political biases, values, and interest from the defining groups and various power relationships have shaped poverty and its mitigation policies (Bradshaw 2007, 5; Nyasulu 2010; Wong 2012). This comes into sharp focus when discussing poverty issues.

2.1.1 Absolute Poverty

In the past, absolute poverty was usually of greater concern in developing countries, but interest in relative poverty has also “gained significant ground in developed economies and has also emerged as important in developing countries” (Duclos and Wodon, 2004).

Work by Rowntree (1901, vii 87) provided some early ideas about absolute poverty that many scholars have developed upon. These were unchallenged for almost half a century (Looter 2007, 8). This view saw the family as the unit of definition and “defined family as poor if their income, total earnings, or minimum total expenditure does not meet the minimum necessities for maintenance of mere physical efficiency of family size”. However, Rowntree further noted

that the income required for all minimum necessities varied with both the size of the household as well as the food required by the severity of the work undertaken (Rowntree 1901, 97). Townsend (1954, 1979) criticised the concept of absolute poverty as defined by Rowntree. He noted that the standard set in Rowntree's explanation of absolute poverty was not sufficiently related to budgets and the customs of working people. He disagreed with the austere ways in which Rowntree proposed that poor people ought to spend their money.

2.1.2 Relative Poverty

The concept of relative poverty was developed based on the understanding that poverty is relative to the accepted modes of behaviour in the communities in which poor people live. Based on this view, relative poverty was defined as a "deprivation of income that may enable people to play the roles, participate in the relationships and follow the customary behaviour which is expected of them by their membership in the society" (Townsend 1979, 31). He provided a broader definition of poverty that looked beyond the lack of economic capacities. In addition, he took into account standards of living within society, and how poverty can lead to social exclusion (Looter 2007, 1208).

Although it is generally accepted that these concepts can be widely applied, scholars have nonetheless criticised them as simplistic, and not useful to reflect other human aspects such as access to education, health, and welfare (Bourguignon and Chakravarty, 2003 and Ravallion, 1996). Wong (2012), in his criticism, noted that all needs are spatially embedded; hence, they vary across time and context. Both relative and absolute definitions have further been criticised for their narrow definition, since these are largely concerned with income and consumption (UNESCO, 2015).

Other definitions such as the capability approach emerged in the 1980s and they questioned "the early concepts of poverty that had typically been framed by accompanying qualifiers such as absolute and relative poverty" (Benzemer and Headey 2007). Later approaches reinvented the concept of poverty and linked it to a wider approach and broader discussion with a focus on other non-monetary aspects of poverty. The economic aspects of poverty must not be overemphasized to the neglect of social aspects such as literacy rates, participation, environmental conservation, and healthy living (Wong 2012, 6; Sen 1984; Norcia et al. 2012).

2.2 General Causes of Poverty

There are many views about the causes of poverty, and these divergent views make it essential to understand the different theoretical arguments associated with the causes of poverty. There are two key divergent theories that relate to the causes of poverty; the cultural/behaviourist theory and the structural/economics theory (Jordan 2004, 18).

Elesh (1970) carried out comprehensive work on poverty theory. He classified the theories of poverty into two separate strands: cultural and structural poverty. He noted that, according to the “cultural theorist valuation, attitudinal and behavioural patterns of the poor prevent them from being socially mobile” while structural theories explain poverty in terms of the conditions under which the poor live. These include unemployment, underemployment, poor education and poor health. Bradshaw (2007) further posited that theories of poverty could also be distinguished as theories that “root the cause of poverty in individual deficiencies (conservative) and the theories that lay the cause of the broader social phenomenon (liberal or progressive)”.

In recent works, cultural theorists have argued that poverty is intrinsic; it is often passed on from one generation to another. “When poverty is experienced in childhood, it is likely to have a long-term impact, because it affects the health and education outcomes that shape the individual’s future earning potential. Assets such as land are also difficult to acquire other than through inheritance, and as a result, lack of assets is another means by which poverty is passed on from parent to child” (Ahmed et al. 2007, 65).

This position was developed in the early work of Oscar Lewis when he argued in 1959 that the idea of subculture impacts poverty. His additional work in 1960 was compared with an earlier study of 171 families in Mexico City. Through both works, Lewis suggested that through many generations, behaviour is cultivated and passed down by people in the same culture. He proposed that, in the case of families from the lowest income and education brackets, poverty becomes entrenched across several generations (Lewis 1970, X).

Structural theorists, however, posit that structural failings in terms of the key economic, political, and social systems cause poverty to a greater degree than culture (Rank 2004, 50). They also argue that sources of poverty could be traced back to various institutional environments that tend to sustain a multitude of economic barriers to different groups (Jordan 2004, 24). Bradshaw (2007) further refined these theories of poverty. He noted that, in contemporary literature, there are five distinguishable theories, and each of them strongly determines the type of poverty reduction or alleviation intervention that is put in place within an individual community or a nation. He outlined the five theories as follows. The first theory holds that poverty is caused by individual deficiency. This theory is based on politically conservative theorists blaming individuals in poverty as architects of their perils. This theory implies that an individual’s lack of intelligence is not easily reversed (Weber 2001; Rainwater 1970). The notion is also closely associated with the work of neo-classical economists who noted that individuals should be responsible for seeking to maximize their well-being by making choices and investments that lead them to greater prosperity (Bradshaw 2007, 6).

The second theory proposes that poverty is caused by a cultural belief system that supports the sub-cultures of poverty. The implication is that an intergenerational transmission of a “set beliefs, values, and skills that are socially generated but individually held” is the key cause of poverty. This theory is based on Oscar’s (1966) work and the idea that a culture of poverty is a set of beliefs and values passed down from generation to generation. The third theory is that poverty is caused by economic, political, and social distortion or discrimination. This theory is based on progressive social theory which posits that economic, political, and social systems are distorted or built with discrimination. These systems create individual poverty and cause people to have limited opportunities and resources with which to achieve income and well-being.

The fourth theory is that poverty is caused by cumulative and cyclical interdependencies. This theory has its origins in the economic work of Myrdal (1958 23). This author developed a theory of interlocking, circular interdependence based on a process of cumulative causation that helps to explain economic underdevelopment and development, once there is a lack in one area, it leads to a lack in others, i.e., a lack of education leads to a lack of participation in decision-making and employment.

Lastly, the final theory holds that poverty is caused by geographical disparities which disaggregate poverty based on diverse geographical areas. This creates “rural poverty, ghetto poverty, urban disinvestment, third world or developing countries poverty” and the principle focuses on the spatial distribution of poverty. It posits that “people, institutions, and cultures in certain areas lack the objective resources needed to generate well-being and income and lack the power to redistribute”.

Although all these theories have been useful for differentiating between the causes of poverty, they have to be viewed holistically and not in isolation. The causes of poverty, even within a homogenous society can be multifaceted, however, in most cases, society is heterogeneous, and thus, more than one theory may apply even to one society or a nation.

2.3 Defining and Understanding Rural Poverty

As earlier noted, poverty has many faces, and must therefore be disaggregated to understand how it affects people in different areas at different times. In the IFAD Report (2011, 46), it was noted that one of the key methods for understanding poverty and particularly rural poverty is being able to disaggregate rural and urban poverty. Creating a distinction between rural and urban poverty is arbitrary and varied. However, in general, when a nation grows, it gradually transforms from rural or agrarian to the urban or industrial economy.

The world is experiencing strong urban growth, influenced by a combination of “urban net fertility, urban expansion through reclassification of areas from rural to urban, rural-urban migration, and international migration” (Proctor 2014, 7). This is significantly driven by industrialization and an industry-led agricultural transformation in regions such as Asia. However, the story is different in Africa, where urban growth is without industrialisation (Proctor 2014, 7,). In contrast to industrialisation or agricultural revolution, urban growth in Africa over the past decades has been driven by the export of natural resources (Gollin et al.2013, Suttie 2019).

The impact of such a transformation on the development of rural areas is still a subject of strong debate amongst academics. Although poverty exists in both urban and rural areas, the vast majority of the poor live in rural areas. In large parts of the world, poverty remains mainly rural, and is an agricultural phenomenon. Communities depend on agriculture, fishing, and forestry-related small-scale industries and services. They also depend on natural endowments for their livelihoods (Khan 2000, 7, Lee et al. 2009, 3, Suttie 2019). This observation is evident in the IFAD 2011 report, which outlined that “of the 1.4 billion people living in extreme poverty (defined as those living on less than US\$1.25/day) in 2005 approximately 70 percent lived in rural areas” (IFAD 2011, 47). Also, of the developing world’s three billion rural people, more than two-thirds reside on small farms of less than two hectares (IFPRI 2007). In 2010, the Food and Agriculture Organization of the United Nations (FAO) reported that 58.8 percent of the total SSA workforce was agricultural in nature, and a slightly higher proportion (63.6 percent) of the total population lived in rural areas.

Understanding rural poverty is important because of the magnitude of rural poverty and its stagnant position in many developing countries, particularly in SSA (Suttie 2019). One of the key challenges in understanding rural poverty is arriving at a definition. The definition of rural poverty to a large extent determines who rural populations are, how they should be targeted, and how the issue is best tackled in different contexts. In defining rural poverty, it is useful to understand its multiple characteristics. Juanah (2005, 23) highlighted these characteristics as “low incomes, low consumption resulting from low productivity, inequality in ownership and access to productive assets, poor health and education, degradation of natural resources, vulnerability to risk, and weak political power.”

Khan (2000) further argued that the rural poor are not homogeneous, and thus defining or understanding the rural poor requires an understanding of their heterogeneity beyond the disaggregation of rural and urban geographical lines. He noted that one productive way of classifying the rural poor was to assess their access to agricultural land. He classified the rural poor into two types: “cultivators that have access to land as small landowners and tenants,

and non-cultivators—landless, unskilled workers”. He further broke these two classes into three subunits, namely (Khan 2001):

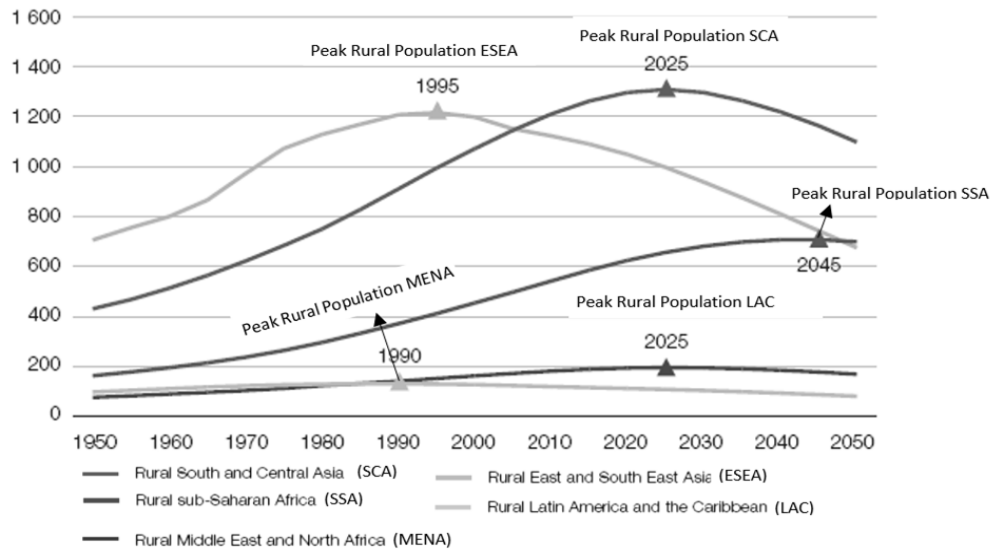
- I. Small landowners who cultivate their land.
- II. Landless tenants who cultivate other people's land.
- III. Landless labourers who depend on casual or long-term employment on the farm or nonfarm sectors.

Despite these categorizations of rural poverty, there are, however, a number of key characteristics that are common to the rural poor. First, the “rural poor usually live in a farmstead or groups of houses containing perhaps 5000–10000 people separated by farmlands, pasture, and trees or scrubs. Second, most rural people spend most of their working time on farms” (IFAD 2001, 17).

Although a commonly used distinction is based on the definitions of physical borderlines as noted earlier, these could, however, vary from country to country. For example, the common borderline use in India is 5,000 persons, but it could go as low as 2,500 in the case of Mexico, and as high as 10,000 as is the case in Nigeria. Others like China and Brazil, however, have used alternative metrics such as “legislative and political borderlines to distinguish between the rural and urban” (IFAD 2001, 17).

2.4 Long-term Trends in Rural Poverty

There is a substantial decline in rural poverty in developing countries, with the current rural poor population standing at around 1 billion, compared to 1.4 billion in the late 1980s (IFAD 2011). This decline is associated with the extraordinary decline of the rural poor, specifically in East-Asia (particularly China) and Southeast Asia. Nevertheless, the rural poor population is increasing in SSA (IFAD 2011, 47) and is very high, with over 60 percent of poor rural people still living on US\$1.25 per day (IFAD 2011).



Sources: FAOSTAT available at: <http://faostat.fao.org/>, and originally from the World Population Prospects available at: <http://esa.un.org/unpp/>

Figure 2.1: Rural population trends (millions of people).

The proportion of the rural population was on the increase from 1960, with a peak increase notable in the 1990s. Most developing countries, however, started to experience a decrease from the late 1990s. Although the projection was that this would fall from 61 percent in 2010 to 42 percent in 2050, the expected rapid increase in the overall population of SSA meant that the total rural population continues to grow, from 622 million in 2010 to a projected 927 million in 2050 (Procter and Lucchesi 2012).

The current rural population as of 2014 in SSA stands at 62.8 percent of the total population (World Bank 2015).

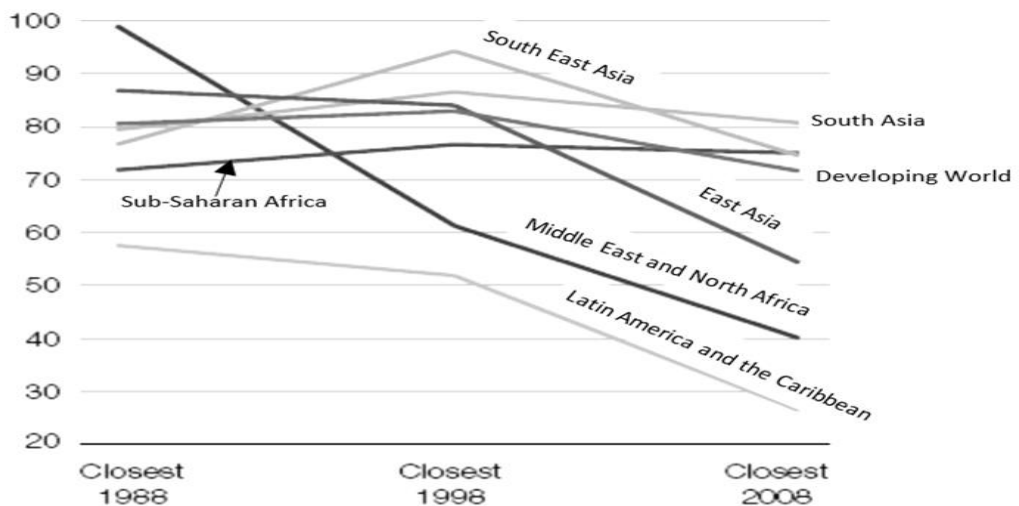


Figure 2.2: Rural share of total poverty.

Source: Rural Poverty Report 2011, International Fund for Agricultural Development.

The percentage of rural people living on less than US\$1.25 a day declined in most developing regions of the world from 1998, with a considerable decline in 2008. Only a small margin of decrease in SSA from 77 percent to 75 percent is notable, compared to East Asia and South East Asia that recorded a decline from 84 percent to 54 percent, and from 94 percent to 75 percent, respectively, within the same period.

This continuous growth is reflected in the number of rural poor in SSA, and a better understanding of the phenomenon and its causes in the region is now required.

2.5 Structural Causes of Rural Poverty

Understanding the structural causes of rural poverty is complex, and the causes of rural poverty are multi-dimensional. This is notably because the rural poor are not homogenous (Khan, 2001). The structural causes of poverty have been defined as the root cause or underlying causes of poverty which are long-term or systemic in nature (Herbert 2017).

Bird et al. (2002) provided diverse classifications of the complex and multi-dimensional causes of rural poverty when they outlined the “interlocking factors like economic, social, and political factors”. These factors must be understood alongside a range of key physical and demographic constraints, and they vary across countries and regions (IFAD 2001, 28), and by gender.

Jordan (2004) described structural factors of poverty as the critical causative elements that are inherent to either the economy and or several interrelated institutional environment that serves to favour certain groups over others and cause people to have limited opportunities and resources with which to achieve income and well-being.

Khan (2001) posited that the multidimensional causes of rural poverty could also “involve, among other things, culture, climate, gender, markets, and public policy”. Smeaton et al. (2001) noted that rural poverty is related to both isolations from economic opportunities and reduced access to social services such as health, sanitation, education, knowledge, and information on participation in governance in their community. Hunger has also been identified as an important cause and effect of poverty (FAO et al. 2002).

Various structural factors also create problems for smallholder farmers seeking to maximize their potential and resources to produce optimally. This in turn has reduced their ability to participate effectively in activities that could support their income generation beyond peasantry (Baumann 2000; De Janvry et al. 2001; Lee et al. 2009). This necessitates a paradigm shift in thinking, planning, and programming for the rural poor, particularly in the agricultural sector. Understanding these dynamics has partly informed this study. In addition, all of these points were reflected in the IFAD 2011 Rural Poverty Report (IFAD 2011) which noted that “rural

poverty is rooted not just in asset levels and in the different spatial distribution of opportunities for growth but also in historical factors, and social and political relationships among the classes, caste, ethnic groups, men, women, and different market actors". Suttie (2019) further classified the causes of rural poverty into three areas as follows: 1) the economical, referring to low levels of productivity, a lack of diversification in rural economies, as well as access to market and inefficient rural infrastructures; 2) the social, referring to some patterns of exclusion and 3) environmental referring to a loss of natural resources that impacts on rural people that rely on agriculture for their livelihood.

2.5.1 Unstable Employment Opportunities and Low Return on Labour

In most developing countries, because of the inadequacy of farm income to support households, a high proportion of the rural poor are increasingly dependent on employment for wages through agriculture and other means. Employment in the rural economy, and particularly agriculture, is seasonal, with low wages, and this traps some people in poverty in rural areas. Khan (2000, 23) noted that dependence on raw labour, without access to assets (physical, financial, or human assets) is an important single source of rural poverty. He further noted that the, largely unskilled workers in rural areas have two choices; to either find gainful employment in the rural area (in agriculture and small-scale industry) or to migrate to the urban, informal economy.

The widely acclaimed and early work by Lewis (1954) and Nurske (1959) pointed out that if workers in rural areas migrate to the informal urban economy sector, or to some other non-agriculture-related industry, there will be no fall in the total output of the sector. As such, labour in the agrarian economy of many of the developing countries, especially during the early stages of their development, is generally in surplus, with abundant resources of unskilled rural labour (Lewis 1954, 197).

This dual economy model seeks to describe the transition process in developing economies, with a focus on agriculture amongst the dominant smallholder farmers (Gustav 2012, 3). It alludes to two areas of thought about developing countries, "firstly that most developing countries have two distinct economies that could be categorized as a small modern economy sector where a production involves producible capital and labour, and a second economy that is a large and traditional sector where only labour (together with a given quantity of natural resources and some simple tools) is used, and most are self-employed in family enterprise and secondly, that traditional sector is a reservoir of surplus labour" (Ghose 2006, 3430). A labour surplus will exist when a substantial portion of the traditional labour force contributes less to output than is required. If such workers could, however, be relocated to competitive or

neo-classically functioning sectors, such reallocation would eliminate the inefficiency above, and thus materially enhance the output of the system (Gustav 2012, 3).

Ghose (2006, 3431) that although the central argument of the Lewis model is that in a labour surplus model, the dual economy leads to economic growth and improvement in employment conditions. Caution should, however, be taken when contemplating the notion that growth in the modern sector alone can reduce, and eventually eliminate surplus labour. He pointed out that the institutional features of the traditional sector, and the process of wage formation in the modern sector predicts that growth in the modern sector alone is most unlikely to reduce surplus labour. "Any rise in the real wage slows down the process of labour transfer by restraining the growth of investments and by reducing employment per unit investment in the modern sector. The possibility of modern sector growth, reducing surplus labour in the traditional sector is even more remote in economies where the modern sector does not produce food and must procure it from the traditional sector through trade" (Ghose 2006, 3432).

This author differentiated between resource-rich households and resource-poor households. He noted that when real wages in a modern sector are very attractive, and when it exceeds real wages in the traditional sector, the resource-rich household (who are not surplus workers) are more likely to move to the modern sector than the resource-poor (who are surplus workers). This might be because, in most cases, the modern sector usually requires some form of formal education for even unskilled jobs, and workers and resource-poor households typically lack this formal education. Further, only the resource-rich are able to support themselves when searching for work. Gustav (2012) noted that the definition of labour surplus proposed by Lewis does not infer that a substantial proportion of the agricultural labour force can be withdrawn without loss of output.

2.5.2 Urban Bias in Development

Biases of national development policies towards urban areas, and a focus on infrastructure development and investment primarily in urban areas have been identified as other structural causes of rural poverty.

Myrdal's (1958) early work assumes that most nations develop urban areas to the detriment of rural areas. Lipton (1977), however, popularized the term "urban bias" and brought the issue to the forefront of development discourse. He noted that many less-developed countries discriminate against agriculture in their quest to diversify their economies to nurture their infant industries. He provided qualitative evidence to suggest that government investments have often favoured the rural elite and urban upper and middle classes, rather than the smallholder. He pointed out that this approach has resulted in the misallocation of scarce resources in the

region. He further posited that if nations want to see widespread development in other sectors, they also need to focus on mass development in agriculture (Lipton 1977, 23).

In a later postulation Yarun et al. (1997, 426) alluded to Lipton's early work when he pointed out that rural development in most developing countries has been slowed down by policies that favour industry over agriculture, and urban over rural areas. Later literature (see the World Bank 2003 and Byerlee et al. 2005) also agrees with these early scholars. They noted that urban bias against the rural economy was systemic. This is based on the historical context in which it was embedded, namely feudal and semi-feudal settings. Such thinking is based on the context of colonial and post-colonial regimes that seek extractive profits from natural resources and cash crops whilst preventing indigenous smallholders in rural areas from gaining access to land and public resources (Lewis 1954; Myrdal 1958; Lipton 1977). The colonial legacy in particular has created a burden on Africa with severe inequalities in the distribution of land between large-scale farmers, smallholders, and state farmers.

These problems of land inequality have created problems for rural communities in many developing countries, and most particularly in SSA (Bezemer and Headey 2007, 11). These biases, to a large extent, have also encouraged rural-urban migration, which could create either a negative or positive impact on the rural poor.

2.5.3 Access to and Distribution of Land

Land is a vital, productive asset in rural economies (de Janvry, et al. 2001 and Ahmed et al. 2007, 15). de Janvry et al. (2001, 15) noted in their early work that the distribution of lands in the agrarian or rural economy is highly influenced by "rules that codify access to land and jurisdiction over land, which in turns impact on how land is efficiently used, the incidence of poverty, and the level of inequality in such community". They further pointed out that lack of access to land, or unfavourable terms of access to land remains a fundamental cause of poverty in rural areas. Bird et al. (2002) pointed out that we need to avoid a simplistic geographical determinism of rural poverty. Access to, and the management of land by the rural poor is largely dependent on numerous underlying political, social, and macro-economic factors.

Landlessness is a major cause of rural poverty in many developing countries. "Landlessness has many causes, including unequal distribution of land, the rapid growth of population, the law of inheritance, privatization of communal lands, periodic economic (price) shocks, indebtedness, and resources (land) degradation" (Khan 2000, 8). One of the first global studies to determine the distribution of the rural poor on less favoured lands was conducted by the Consultative Group on International Agriculture Research, CGIAR (1999). It concluded that nearly two-thirds of the rural populations of developing countries (almost 1.8 billion

people) live on less favoured lands, including marginal agricultural lands, forest and woodland areas, and arid zones (Barbier and Hochard 2014, 3).

Where land is more favourable, it tends to be remote and some distance away from markets. There is, as a consequence only limited access to infrastructure. This constraint on land in rural areas, amongst many other factors, has forced the rural poor towards remote, low potential, marginal or weak integrated areas. These land areas also "...exhibit a combination of unfavourable natural resources base, poor infrastructure, weak state, and market institutions and political isolation" (IFAD 2011, 52).

2.5.4 Constraints Over Access to Market

Any agricultural growth strategies for the rural poor must essentially include access to domestic, regional and international markets (OECD 2007, 15), and resources. The economic environment where poor rural households operate is, however, "characterized by unpredictability, uncertainty, and risks; and agricultural markets in particular for input supplies and agricultural products have become increasingly difficult to access" (IFAD 2003, 6).

The issue of market access may be classified into three categories: physical access to market; the structure of the market; and a lack of skills amongst producers including poor access to information (IFAD 2003, 9). In general, access to markets for rural households should focus on multiple markets. Taylor et al. (2009) classifies multiple markets as factor markets which include labour, land, and capital. They also include input markets which include technology, and extension and output markets which involve poor households selling produce on equitable terms to secure high-paying, non-farm jobs.

Access to markets, most particularly the output market in developing countries, and particularly by rural producers has been affected by the "restriction standard and subsidies of wealthy states down to local-level factors. This also includes weak transportation and communication infrastructure and limited market information" (OECD 2000, 153). The lack of access to the market in rural areas reduce the ability of the rural poor to participate in activities that might otherwise have enhanced their income and improved their livelihoods. Globalization has paved the way for international agricultural trade around the world, which makes it more difficult for farmers in countries with a poorly developed agricultural sector to compete locally or internationally. International trade exposes local producers to fluctuations in global prices for the crops they cultivate and consume (Taylor et al. 2009, 4).

The participation of smallholder farmers in the global market through market liberalization is also not equitable. Some of these trade rules on agricultural commodities are biased and favour the development of the agricultural sector in the developed regions to the detriment of

the smallholder farmers in the developing regions. This is primarily because of unfair subsidies paid to agricultural businesses in the developed regions, compared to what those in SSA receive (FAO 2012, 22). Compliance with international trade rules often requires financial, information, and network resources that most smallholder farmers do not have (Lee et al., 2012, 12327). This has limited the capabilities of smallholder farmers to participate in the global market.

Access to these markets is critical for agriculture, which is the main source of livelihood for poor rural dwellers. A lack of access to these markets can have a major impact on rural households in many ways, most particularly because their livelihood depends on their involvement in these markets, either as producers or workers. When a poor household lacks access to these markets, this has a knock-on effect on several other areas of their lives, including their ability to obtain credit, adopt new technologies, insure against risks, or obtain consumable goods at low prices (Taylor et al. 2009).

2.5.5 Access to Credit or Finance

Access to markets should be complemented by the assets required for the effective use of land. Access to finance is the bedrock of access to all other resources required in agriculture in general.

Agriculture requires consistent finance or credit, along the value-chain (Cheru and Modi 2013, 21). However, the cost implications of rural financing have made agricultural credit and finance unattractive to many commercial lenders. Estimates by FinScope suggest that 30–60 percent of the rural population in SSA have no access to financial services at all (FinScope 2014). Where a loan is given in the agricultural sector, this typically targets commercial agriculture. This constraint can be attributed to the perceived inability of smallholder farmers to provide collaterals to repay their loans, and the assumed volatility and risk associated with crop production, prices, and markets, particularly those that implicate smallholdings (World Bank 2015).

Stiglitz (1998) asserts: that “market failure is a fundamental cause of poverty and that financial market failure limits the access of the poor to formal finance, thus pushing the poor to the informal financial sectors which in most cases have high fixed costs of small-scale lending and affect the economy of scale of the farmers”. Inefficient rural financial services with inappropriate macroeconomic and sectoral policies increases rural poverty (Yarun et al. 1997, 425).

Although formal finance and credit facilities are occasionally available in rural areas, they are, in most cases, not financial facilities designed to suit the needs of the rural poor. Access to

credit in rural areas is predominantly informal (money lenders, merchants, landlords, friends, and relative), because of its less stringent collateral requirement “but with high-cost finance that may even lock the borrowers into mortgaging their assets (land) or labour” (Khan 2000, 18).

Ahmed et al. (2007) note that limited access to credit for those with few assets, and a lack of productive labour amongst the poor are the major causes of rural poverty. A lack of credit and income security deprives many rural households of access to productive inputs, and discourages them from producing high value, risky crops (Taylor et al. 2009).

2.5.6 Access to Resources: Infrastructure, Information, and Inputs

As a result of urban biases, great disparities still exist at the level of infrastructure in rural areas compared to urban areas. Most infrastructural development policies and plans in the developing regions are focused on urban regions.

Lipton (1998) argued that the underfunding of agricultural research at national and international levels is a key threat, though a hidden one, to the success of poverty-reducing policies. According to Fakayode et al. (2008) "...the provision of efficient infrastructure is widely recognized as indispensable to agricultural progress, and this could support economic growth and reduce poverty". A lack of adequate and reliable rural infrastructure impacts negatively on the lives of rural families.

When infrastructure is not available or accessible, it limits the poor rural dweller's ability to access the resources that are required to create economic growth. Even though physical infrastructure (irrigation, transport, and communication) and support (research and extension) have been proven to help the rural poor make the best use of their resources (Khan 2000, 23; Adepoju and Salman 2013, 2), the focus on rural infrastructure in developing countries has not received adequate attention through research. In most cases, these rural infrastructures are unavailable or inadequate in SSA. In general, most of the rural roads in SSA are inaccessible. As a result of poor rural roads and long distances to market, the cost of rural transportation is generally high, and makes sales unprofitable for many crops (Livingstone et al. 2011).

Processing, aggregation, transportation, and the warehousing of most crops is carried out under certain conditions that require a constant energy supply. However, the power that is required to generate energy for the use of most equipment along the value-chain is either unavailable or inadequate. As a result of these constraints, many farmers have experienced postharvest loss. About 37% of food produced in SSA is lost between production and consumption (FAO 2011) and this has been attributed to a lack of adequate facilities in farms

and towns. Such postharvest loss reduces profitability and discourages smallholder participation in production for the market.

Inputs are also known to be crucial to the productivity of agricultural produce. However, in many countries, “inputs were delivered to the rural areas too late to be used effectively, they were limited in the variety available, and frequently they were sold in quantities inappropriate to smallholder farmers” (IFAD 2003, 6). For example, although there is a general increase in the agricultural production in SSA, this is largely due to increases to the area of land cultivated, rather than an increase in productivity (IFAD 2010). SSA remains well behind all regions in the use of improved seed and fertilizer. On average, farmers in SSA apply less than 10 kg of nutrients per hectare, compared to around 140 kg of nutrients per hectare in both Latin America and South Asia (WDI 2010). Between 1997 and 2007 in West Africa, there was only enough improved seed to meet one-third of the demand created by farmers (Ndejeunga and Bantilan 2002; AGRA 2011 and Adesina 2010). A similar issue was experienced in irrigation, and the amount of land irrigated in the last 50 years is less than 3% in SSA, compared to 36% in Asia (IFAD 2010). Mechanization is also substantially lower than in other regions where only 15 tractors are used per 100 km in contrast to 100 in Latin America and the Caribbean (IFAD 2011, 13).

The lack of access to, and unequal distribution of resources has been attributed to low productivity amongst smallholder farmers in SSA, which in turn impacts negatively on the rural poor. These include a lack of access to, and unequal distribution of land, a lack of access to finance and credit, and reduced access to input and information and other public resources (Lipton 1977; de Janvry 2001; Yarun et al. 1997 and Ahmed et al. 2007).

2.5.7 Low Skills and Education

Khan (2000) noted that building and strengthening the human capital of the rural poor is essential to lift them out of poverty, and where this is weak or not available, rural poverty may persist.

When the impact of human development is disaggregated across rural societies, women, youth, and indigenous people are often disproportionately affected by a disadvantage that tends to make their mobility out of poverty harder. This also makes access to existing opportunities more limited, and the risks involved in accessing them become greater (IFAD 2011, 60). In many developing countries, women produce many of the food crops, and undertake most food processing and preparation in addition to their family tasks. They are, however, highly disadvantaged through a variety of forms of exclusion, discrimination, and disempowerment. They are impacted by unequal access to, and control over assets, a lack of

education, and limited collective capabilities which often exacerbates their level of poverty within the rural community (IFAD 2011, 60).

Similar issues have been raised about children who are born into households with poor parents. Across the developing world, children aged 0–14 years make up between 19 and 42 percent of the population (in East Asia and SSA, respectively) (IFAD 2011, 65). These children, in most cases grow up to become poor adults because of the high dependency ratio in most rural households. This makes it even more difficult for children to access care, education, and nutrition to enhance their ability to escape poverty in the future (IFAD 2011, 46).

Access to health in rural areas, and unexpected events that cause ill health, death, a loss of assets, or a loss of income (often collectively referred to as shocks) are also tremendous determinants of rural poverty (Ahmed et al. 2007, 65). When the “breadwinner(s)” in a family is ill or dead, in most cases, there is no alternative or substitute provider to play that role. This could, in effect, lead to child labour and an excessive burden on the surviving or healthy spouse (in most cases women). Their roles then extend to include acting as the head of the household, and the sole breadwinner. This scenario reduces the chances of this type of household to get out of poverty, and it inadvertently increases their chances of living in poverty.

In addition to health, education is also essential and important to increasing human capability in general, and specifically in rural areas. Empirically, education is recognised as having a significant positive impact on agricultural productivity it strengthens ability to engage in off-farm self-employment, capability to access credit and skill development. As a result of low skills, the poor are often trapped in employment that does not require high levels of specialised competence which takes a long time to acquire (Ahmed et al. 2007, 72).

In addition to the capabilities issue, recent researchers have also shown that social networks, along with institutional factors, are the key causes of rural poverty (Ruspasingha and Goetz, 2007). Hence, helping a group of poor people builds supportive communities which share, trust, and mutuality enhance social capital to alleviate poverty (Bradshaw 2007, 15).

The power dynamics within and outside rural communities also impacts negatively on rural poverty. In most cases, rural people are excluded from political power. Power dynamics govern natural resources access and tenure, and many poor people are marginalized from these (Prato and Longo 2012). According to Ahmed et al. (2007), while exclusion from political power can occur on the grounds of ethnicity, gender, or other prejudices, it can also result from a lack of asset ownership. Large landholdings can give their owners special social status or political power. The impacts are worse for women, who are less represented than men in

leadership, governance and decision-making processes. Women are often denied the right to hold title to land (IFAD 2011, 62).

2.5.8 Inconsistent and Ineffective Micro and Macro Policies

Many characteristics of the economy and society, with some external influences, can create rural poverty (Khan, 2001). The varied nature of the rural poor makes it essential to understand how changes in both micro and macroeconomics and policies can affect them. Inefficient government institutions and policies reduce the rural poor's access to markets and resources such as seeds, fertilizer, farming equipment, credit and working capital, farm labour, and knowledge. Khan (2001) identified three major ways in which policies affect the rural poor: through markets, infrastructure (including public services), and transfers. Similar biases are evident in the international economic system. For example, the focus on aid for developing countries, most particularly in rural areas, has dramatically reduced. The global volume of assistance for agriculture that is key to the rural economy has reduced by nearly two-thirds between 1980 (US\$6.2 billion) and 2002 (US\$2.3 billion). It more than halved in SSA during the same period. (Bezemer and Headey 2007, 16). The impact of such national and international economic policies was significant during the implementation of structural adjustment in most developing countries. This is particularly the case where Washington played a significant indirect role in the national government of developing countries, reducing its support for agriculture. Indeed, it "failed to replace ineffective public institutions in the agriculture sector that are key to the rural economy with anything better" (Eastwood and Lipton 2004).

The call by the "Washington consensus" (widely referred to and known as the key instrument and apostle of the Structural Adjustment Program) to cut government expenditure in developing countries as part of the implementation of the Structural Adjustment Program in the early and mid-80s has had a major impact on the rural poor. The cut in the government expenditure impacted negatively on the formal credit, input supply program and subsidies for fertilizer, and animal traction equipment that are essential for agricultural growth of the smallholders in the rural areas (Reardon et al. 1994 and Diao et al. 2006). The implementation of the Structural Adjustment Policy and program created systematic burdens in rural areas. It weakened the political voice of these communities relative to others in society and impoverished the rural poor to a greater degree. It is, however, now understood that neither macroeconomic stability nor economic growth is enough to alleviate poverty. (Gunter et al. 2005).

Currently, existing policies and institutions, including growing resource degradation, and conflict and its aftereffect in many developing countries limits access to resources that could alleviate poverty amongst the poorest (Prato and Longo 2012).

2.5.9 Rural-Urban Migration

Ravallion and Datt (1999) noted that the rapid growth of urban areas in the absence of sustained rural (farm or non-farm) growth tends to reinforce the rural-urban disparities and does not benefit the poor. High levels of rural poverty, both with or without overall economic growth, has been feeding into rapid population growth and the migration of people to urban areas (Khan 2000, 6).

This rural-urban migration has been exacerbated because agricultural wage labour is one of the lowest-paid and unsafe jobs (Tacoli 2007, 92). Some scholars claim that this trend in rural-urban migration has had little positive impact on the rural areas. They claim that the impact that has occurred cannot be generalized to all nations. Both Cali and Menon (2013) and Fan et al. (2005) studied India and China, respectively, and concluded that the contribution of urban growth to rural poverty reduction is insignificant. Even with growth in urban areas, over 62 percent of Africans still reside in the slums (Quingjie and Dashu 2013, 3).

Other scholar has noted a strong correlation between urban growth and rural poverty, and vice versa. Ravallion et al. (2007) identified two key impacts of urbanization on rural poverty. The first impact is the considerable number of rural poor that become more productive through the application of their skills in urban areas, where opportunities for such skills may be needed more. Secondly, urban migration creates a vacuum in rural areas as there is a tendency for rural-urban migrants to be young men that can support rural activities.

The overall impact of urbanization on rural poverty may be substantial, but in the absence of data on the poverty profile of rural-urban migrants, it may be difficult to distinguish between the two effects (Cali and Menon 2009, 2).

2.5.10 Globalization, Climate Change and Natural Resources Degradation

Other factors like natural resource degradation, which has been outlined earlier, and climate change can create constraints that could hinder the alleviation of rural poverty (IFAD 2011, 83). In general, poor rural people are affected by the worsening impact of climate change because of their high dependency on agriculture, and because the high proportion of rural communities that live in areas that are less favoured, and not environmentally friendly.

“The crop model indicates that in 2050 in SSA, average rice, wheat, and maize yields will decline by up to 14 percent, 22 percent, and 5 percent, respectively, as a result of climate change” (IFPRI 2009).

As a result, the rural poor strongly and often directly depend on the use of natural resources to sustain their livelihoods. They lack the ability to reduce their own vulnerability, which could have substituted physical and financial capital for natural capital (natural resources). As such, “changes in resource availability or quality due to climate change will affect them directly” (Lee et al. 2009, 4).

Climate change reduces the resources available to rural farmers. Extreme weather events and climate change can be considered risk multipliers; they have long been considered major sources of disaster-related food insecurity, which also affects the rural poor (IFAD 2011, 83). Climate change promises to alter the fundamental features of the natural resource base through “rapid and uncertain changes in patterns and timing of rainfall and temperature, which threaten food production and lead to food price shocks, increase the vulnerability of smallholders, and accentuate rural poverty” (AGRA 2014, 15). As much as between 5 to 10 hectares of agricultural land are lost each year to severe degradation through overuse, poor land management, or soil nutrient mining (IFAD 2011, 84). This leaves the land vulnerable to extreme weather patterns and has a direct negative impact on agricultural productivity.

Most of the factors outlined above are affected in different ways by the changing forces of globalization and trade liberalization. They are also impacted by market integration and democratization, amongst others (Lee et al. 2009, 4). These forces can create both opportunities and challenges in developing countries, most particularly with the rural poor.

Globalization and trade liberalization infused by the World Trade Organization (WTO) and regional trade agreements have increased access the access that local agricultural producers have to foreign markets. Such access could be either positive or negative for the rural poor. It could give their products greater exposure, or it could lead to steeper competition from abroad (IFAD 2007).

Globalization has paved the way for international agricultural trade around the world, which makes it more difficult for farmers in countries with poorly developed agriculture sectors to compete locally or internationally. This exposes local producers to fluctuations in global prices for the crops they cultivate and consume (Taylor et al. 2009, 4). In SSA the “economic determinants, and the presence or absence of certain institutions constitutes additional factors that promote or hinder the transmission of global forces to the poor and induces discontinuities and unexpected consequences” (Sindzingre 2005, 3).

According to Sen (2002) globalisation, in itself is not negative; neither is an issue of the market as an institution. Rather the issue is the “inequity in the overall balance of institutional arrangement that produces an unequal sharing of the benefit of globalisation”. This highlights

the role of subsidy and related support for farmers in developed countries. These are major factors that impede the growth of smallholder agricultural produce, which is the main source of livelihood for poor rural people in developing countries.

In 2001, total public support for agriculture in member countries of the Organization for Economic Co-operation and Development (OECD) amounted to US\$311 billion (six times the total amount of official development assistance). On the other hand, producer support for domestic subsidies, import tariffs, and export subsidies in OECD around the same time were estimated to be one-third of total farm receipts (IFAD 2003). These hefty subsidies in most developed countries, particularly in the OECD, are exacerbating the difficulty faced by farmers in developing countries that want to compete in international and local markets (IFAD 2007).

All these multifaceted factors contribute to making the causes of rural poverty multidimensional.

2.6 Policy Interventions to Mitigate Rural Poverty in the Developing Countries

Rural development over the past half-century has been intense and complex. The 1960s witnessed a period of modernisation, and the 1970s was defined by state intervention. The 1980s saw market liberalization, and the 1990s was defined by participation and empowerment” (Ellis and Biggs 2001, 437). The processes and practices are, however, not as simplistic and systematic as they first seem. “There are leads and lags in the transmission of new ideas on rural development across space and time” (Ellis and Biggs 2001, 437).

Despite this complexity, there is a need to seek to identify the dominant discourse, policies, and programs relating to rural development since the 1960s. Programs on rural development for the past 40 years have mainly focused on agricultural productivity as key to the reduction of rural poverty (DFID and Oxford Policy Management 2004, 3). Amongst the developing countries, the impacts of the policies are not homogenous. Some policies have been identified as successful, while some have not. The level of success or failure of these interventions is determined by several factors at different times, as highlighted in the following section.

2.6.1 Approach to Rural Poverty Alleviation in the 1960s to 1970s

The first paradigm shifts in rural development occurred in the early to mid-1960s period when small-farm agriculture began to be considered the engine of growth and development (Ellis and Biggs 2001, 440). This represented a shift away from the dual economic theory of development that dominated the 1950s (Lewis, 1954, Fei and Ranis 1964). Early intervention in combating rural poverty was embarked on by the intervention programs of the Rockefeller and Ford foundations in the late 1960s, through its program tagged “Green Revolution”; a term coined in 1968 by the Administrator of the United States Agency for International Development

(USAID) William S. Gaud, to describe the phenomenal growth in agriculture during this period (IFPRI 2002).

The Green Revolution program was developed in response to the US President's Science Advisory Committee report of 1967, which concluded that the scale of world food problems during that period required a massive, long-range, and innovative effort (IFPRI 2002). The initial focus of this initiative was to invest in research on agriculture, with specific attention paid to research on rice and wheat, which were considered the key staple food crops in the developing regions. However, attention was later directed towards high-yielding varieties (HYVs) of other major important crops for developing countries. The HYVs were supported by irrigation or controlled water supply, and improved moisture utilization as well as fertilizers, pesticides, and the application of associated management skills (FAO 1996).

This initiative brought about some degree of success in some areas in developing regions, particularly in Asia and some parts of Latin America, where there was a record of increased yield and income amongst farmers. Statistical indicators during this period showed that the yield of rice and wheat doubled between the 1960s and 1990s in Asia. Cereal and the calories available per person increased by 30 percent in this region within that period. This was instrumental to the cushioning of the impact of the expected widespread famine in the region during that period. The initiative also stimulated the rural non-farm economy that provided alternative employment to the rural poor and increased their income further. Real per capita income almost doubled in Asia between 1970 and 1995, and poverty declined amongst nearly three out of every five Asians in 1975 to less than one in three in 1995. This was despite a 60 percent increase in the population (IFPRI 2002).

However, the huge success of the Green Revolution, particularly in Asia, was not recorded in SSA. The initiative, however, was not a general failure in SSA as shown by the High Yield Varieties (HYVs) of wheat in the Republic of South Africa, Zimbabwe, and Kenya (FAO 1996, 7). Critics, however, noted that the failure was "attributed to poor infrastructure, high transport costs, limited investment in irrigation, and pricing and marketing policies that penalized farmers, which made the initiative too expensive or inappropriate for much of Africa" (IFPRI 2002).

They noted that the owners of large farms were the main beneficiaries of the Green Revolution rather than the smallholder farmers, who were either unaffected or harmed because the "Green Revolution resulted in lower product prices, higher input prices, and efforts by landlords to increase rents or force tenants off the land" (IFPRI 2002 and Carney 1999). Further critique focused on the negative impact of the initiative on the environment and increases in income inequality as well as inequitable asset distribution, and worsened absolute poverty. (IFPRI

2002). The same critics, however, opined that, generally, the initiative was not successful in alleviating rural poverty (Harwood 2013).

2.6.2 Approach to Rural Poverty Alleviation in the 1970s to 1980s

The notion of rural development became more popular in the 1970s in most developing countries, and particularly those in SSA (Harris 1982, 15). This was partly due to a shift in thinking that poverty alleviation was key to the development agenda. It was posited that to alleviate poverty, rural development is crucial because of the high percentage of poor people living in rural areas during this period (Takeuchi 2000). This notion was strongly influenced by increased spending by the World Bank on rural development, and a strong focus on programs that target the rural poor. From the end of the 1960s, the World Bank's lending for agriculture and rural development increased, and "the ratio of lending for rural development, namely "poverty-oriented project" was enlarged" (Takeuchi 2000).

This was seen as a "trickle-down" approach to development (Baas 1997, 3), with the understanding that if economic growth continues within a country, the results will trickle down to the poor. Efforts to mitigate rural poverty in developing countries during this period until the early 1980s were focused on making state enterprises more efficient (Carney 1998).

This approach was criticized for its homogeneous nature, which assumed a global blueprint or a universal recipe for poverty alleviation and rural development without contextualizing it. It had little impact on the development of the target group (rural poor), and its implementation resulted in "urban-biased development expenditures and growth of favoured elites in the rural areas" (Baas 1997, 3).

Baas (1997) pointed out some of the key reasons for this failure as follows:

- I. The lack of beneficiary (the rural population) participation and the weakness of their negotiating power.
- II. Little attention was paid to capacity building in local institutions. A focus on the design of the intervention programs leaned towards central-local governments, and little attention was paid to local governments or institutions that were close to local people. Also, practitioners and programme coordinators of most of the programs were dominated by expatriates who had little knowledge and appreciation of the social and cultural factors that affected the lives of the rural poor.
- III. Assumptions were also made about the superiority of large farms in economic terms, and smallholder farmers were assumed to be backward in their use of technology. They were also seen as inefficient producers. This assumption misguided land policies and distribution in many developing countries. It also impacted on the participation of

local communities in regulating access to land and the management of the use of natural resources. The focus on agricultural support programs was also mainly directed at large farmers.

- IV. There was an excessive emphasis on sectoral approaches, and this neglected the important linkage between the on-farm and off-farm sectors.
- V. There was also a high gender disparity with this approach, as women farmers and workers were overlooked despite their key roles in rural development.
- VI. In addition to the local reasons, external impacts through uneven trade and protectionism in the developed world were also identified as barriers to smallholder agricultural producers and net sellers.

2.6.3 Approach to Rural Poverty Alleviation in the 1980s to 1990s

Ellis and Biggs (2001, 443) noted that, while advocates of a grassroots approach to development may like to disassociate themselves from the World Bank liberalizers, nevertheless, the spaces in which grassroots actions flourished from the mid-1980s onwards were created in some measure by big government backing off from heavy-handed involvement in the rural economy. This action by the state did not occur voluntarily; it was based on the external influence of the financial institutions under the structural adjustment programs.

From the late 1980s until the mid-1990s, there was a shift towards a neo-liberal approach and its accompanying structural adjustment programs in developing countries. Key amongst the critics of past rural development interventions and propagators of the neoliberal approach were the World Bank and the International Monetary Fund (IMF). To assert the new approach, they pointed out the inefficiency of the project management system in past rural development programs. They argued that most of the management efforts of rural development projects did not involve local rural dwellers in planning and management. They also noted “that project implementation was supply driven by funds and project slots and the need to meet arbitrary target criteria rather than demand-driven by sound strategies and realistic well-prepared proposals” (World Bank 1988b, xviii).

The World Bank assessment reports noted two core issues with the rural development strategy during this period: (i) the economic rate of return on project implementation. A project was considered successful if its economic rate of return was over 10 percent at project completion and (ii) they faulted the development strategy in the developing region. They posited that there was a degree of non-coherence between rural development projects and the macroeconomic policies of most developing countries (World Bank 1988b, 18). Improving on these factors influenced the implementation of Structural Adjustment Program (SAP) in the developing countries with the assumption that through the SAP, the economics of the

adopting country will grow and, with the expectation that the gain achieved through the growth would trickle down and benefit the poor, leading to a reduction in poverty (Oberdabernig 2010).

The decrease in the overall spending of countries that applied SAP in their economic policies however rather certainly reduce the wellbeing of both labour and the poorest members of society (Heler 1988 cited by Oberdabernig 2010). “Neither the IMF nor the World Bank has been able to demonstrate a convincing connection in enhancing economic growth” (Killick 1999).

Four main themes characterized the rural development agenda of the 1990s: a strong emphasis on the environment, and the protection of natural resources together with a continued focus on macro policy liberalization, the role of government, the private sector, and the importance of effective public management (Carney 1999).

2.6.4 Approach to Rural Poverty Alleviation from 2000 to 2015

From early 2000, the rural development agenda and the programs of many developing countries were built on the first of the eight United Nations Millennium Development Goals (MDGs). These eight MDGs were set at the UN General Assembly (UNGA) in 2001 and were agreed by 189 nations. “These MDGs were framed around a multidimensional conception of poverty and their focus on human development shifted policy attention well beyond economic growth objectives, which had dominated previous development agendas” (UN System Task Team on the Post-2015 UN Development Agenda 2012).

Eradicating poverty is at the core of MDGs as a whole. However, the first goal was specific to the eradication of extreme poverty and hunger by 2015. This first goal had two key targets; to half the proportion of people living on US\$1/day by 2015, and a similar target to help people who suffer from hunger.

Several scholars have studied the overall impact of the MDGs, and particularly the poverty reduction goal, yet the outcome is inconclusive. Saith (2006) noted that MDGs have arguably neglected the very poorest by focusing on percentages and non-universal cover for the most part to achieve quantified targets at the expense of quality. Sumner and Tiwari (2011) noted that, overall, across all developing countries, evidence of the acceleration of poverty reduction is very limited. Only income poverty reduction and water access were accelerated in more than half of all countries.

2.6.5 Post-2015 Position on Rural Poverty

The debate is, however, strong when it comes to post-MDGs, with a shift to new development policies and programs that now define the global framework, a replacement to the eight MDGs by the 17 Sustainable Development Goal (SDG). This new development agenda

recognizes that eradicating poverty continues to pose a major challenge and will remain key to the development agenda. It recognises that, although poverty has declined globally, this growth, as earlier noted has been uneven in different regions of the world, and a high concentration of poor people remain concentrated in rural areas.

The new development agenda also noted that rural development and rural agricultural productivity are crucial to the reduction of rural poverty. It reinforced the idea of tackling the “impact of climate change, deteriorating ecosystem, and unsustainable natural resource management as important to poverty alleviation and noted the role of pervasive inequalities in income and economic opportunities in diverse areas” in increasing poverty most particularly in the rural areas (FAO 2015). It is expected that this new SDG agenda will guide development practices in general and specifically, interventions on rural poverty.

Overall, this chapter has examined extensively critical areas of literatures on poverty in general and particularly on rural poverty. It uncovers research opportunities on the role that agriculture can play in addressing rural poverty, the structural constraints of the agriculture and several poverty alleviation interventions in history The next chapter examines

Chapter 3: Agribusiness Model for Agricultural Development in a Historical Context

This chapter explores the historical context of agricultural practices in general and seeks to understand diverse practices in the past and present at both , it also seeks to explore the factors that most impinge or support the success of the different approaches.

It further explores debates that surround the dominant agricultural practices in the developing region. In doing so, it looks into subsistence and market-led agricultural production. It examines how these have supported agricultural practices. It examines their impacts and limitations in supporting high productivity in the agricultural sector.

3.1 Production for Subsistence

Generally, the debate on agriculture and poverty alleviation has strongly favoured the positive impact that agriculture could have in reducing rural poverty and enhancing economic growth in developing economies (Igbalajobi et al. 2013). Agriculture that improves productivity on small farms has proven to be highly effective in reducing poverty, and hunger and raising rural standard (IFPRI 2007; Suttie 2019).

The expected impact of the agricultural sector on rural poverty has, however, not been felt in most developing countries. Agricultural productivity remains low in SSA. In the Alliance for a Green Revolution in Africa (AGRA) Agriculture Status Report for 2014, calculations using data since 2008 indicate that the average value added per worker for 34 SSA countries is US\$318, compared to a world average of US\$1000 for the same period. "This low productivity in agriculture translates to less than US\$1 per day, a key factor affecting rural poverty" (Rosen and Shapouri 2012). The disconnect between the agricultural sector and rural poverty reduction has largely been associated with agricultural practices in developing nations, most particularly in SSA. These practices were, for a long time, characterized by small-scale subsistence farming (Frelat et al. 2016). Most rural farmers have remained in subsistence farming in SSA because of the structural issues explained in the last chapter.

There have been several debates on the concepts of smallholder and subsistence farming, few literatures has however attempted to provide a distinct definition of each of the two. Smallholder agriculture or farming has been used generally to describe rural producers predominantly in the developing countries whose farm is mainly using family labour and for whom the farm provides the principal source of income (Cornish 1998) and they participate in off-farm employment in the rural areas (Ellis 2000).

Several scholars have approached the definition of subsistence farming from either the consumption or production perspectives. From a consumption perspective, it was viewed as farming in which production occurs for personal or family consumption (Barnett et al 1997).

This is characterized by low productivity, risk and uncertainty (Todaro 1997, 722; Bruntrup and Heidhuess 2002, 7). From the perspective of production, this is a form of farming that sees less than 50 percent of the product sold (Wharton 1970; Elwert and Wong 1980, 509; Bruntrup and Heidhuess 2002, 7).

The term subsistence is generally also identified with concepts such as traditional, small-scale, peasant, low-income, resource-poor, low input, low output, or low technology farming (Bruntrup and Heidhuess 2002,1). This generalization has, however been criticized for not considering the heterogeneity of smallholder farmers that are engaged in subsistence farming across the region. Dercon and Collins (2014, 3) in their criticism of the homogeneity of the subsistence concept noted that even though subsistence farming has been associated with small farms, there is growing acceptance that small farms do not necessarily correspond to low levels of output, especially when these are based on land inputs. Nevertheless, the extreme poverty that has permeated the rural areas in SSA for a long time with lean resources at the disposal of the majority of the farmers in most of the countries in the region has made most of them focus on investment that could only support production for their immediate needs (de Martiness et al. 2016, 25).

Because of the intertwined factors between both smallholder and subsistence farming mentioned above, this thesis adopts the understanding that smallholder farmers although not heterogenic however are generally subsistence in practice. Although occasionally engaged in marketing of some of the crops, only when there are surpluses from the sustitence production and mostly adopt the use of family labour, with the primary source of income from both on farm and off farm in the rural areas .

Subsistence agricultural practices are not new. However, it is only relatively recently that attention was given to subsistence agriculture when it became clear that without the presence of locally produced food, a high amount of already scarce government funds would be used to support the importation of food. It was felt this would directly increase demand across different countries for food importation (Bruntrup and Heidhuess 2002, 4; PWC, 2020).

The inability of the subsistence practices that dominated the agricultural terrain in the developing world, particularly SSA (Cheru and Modi 2013,19) to proffer solutions to the most compelling needs of the rural community in that region calls for novel approaches to delivering agricultural practices. These must take the form of ideas that they can appreciate, and that can be more valuable to them. In response to this, the role of the market-driven agricultural approach has re-emerged as a subject of discussion in many national and international for a. This has been catalysed by the perceived role that the approach could play in maximising

agriculture resources to reduce rural poverty and enhance economic development in developing regions (Juanah 2005, 24; Suttie, 2019).

3.2 Production for the Market

Production for the market has been widely viewed as an alternative to subsistence farming. Since the beginning of the colonial era, the argument for a shift in agricultural practices from subsistence production to production for the market has been very strong (Elwert and Wong 1980, 506). The need within the colonies for primary commodities is the primary driver for the increased focus on agricultural production for the market. This benefits the countries or the region in which the commodities are produced.

However, from the 1980s, the focus of development policies generally shifted to macro-policy under the structural adjustment program. The issue of production for market took centre stage at this time (Bruntrup and Heidhuess 2002, 7). During this period, there were arguments as to the limitations of subsistence production in supporting food security and uncertainty as to the extent to which it was possible to contribute to economic growth through export and foreign exchange earnings. It was also thought that subsistence production was underutilizing resources in agricultural production without economies of scales (OECD 2010)

Although the general conception that subsistence agriculture is only focused on production for consumption may have been generalized, smallholder farmers practising subsistence farming have sometimes engaged in mixed agriculture for their own consumption, as well as for the market (Bruntrup and Heidhuess 2002, 2). However, at a very minimal level this has usually been based on unplanned surpluses in crop production.

When subsistence farmers produce for the market, they usually obtain a lower price than what they might otherwise obtain if the product had been primarily intended for the market. They seldom search for “remunerative prices” for their products, partly because when they engage in the marketing of their crop, it is often based on immediate needs like the repayment of advanced loans, and to meet immediate domestic needs (Kumar et al. 2012, 125). They are willing to sell once the selling price of their product is higher than the cost of production other than labour. Such farmers subsidize the cost of their products by subsistence production (Elwert and Wong 1980, 509).

Critics have expressed concern about the efficiency of the market-driven approach (Kumar et al. 2012,125), particularly as it relates to smallholder farmers, who are crucial to the agricultural sector in developing countries. They question why smallholder farmers tend to drift back to subsistence farming in developing countries despite numerous interventions and

increasing opportunities to redeploy farmers towards agricultural production for the market (Bruntrup and Heidhuess 2002, 1).

3.2.1 Factors that influence the shift to Production for Market

The incentive to produce marketable surpluses is low where there is a marketing constraint. There are diverse marketing challenges that smallholder farmers encounter, including a lack of access to the market, and market information (Azam and Besley 1991). Where the agricultural market is non-functioning or market information is limited, smallholder farmers tend to sell a limited percentage of their product that is not consumed at lower prices to intermediaries. They, in turn make a huge profit out of the primary efforts of smallholder farmers. The assumption that their product is not profitable or yields very low-profit margins tends to discourage smallholder farmers from cultivating more land or increasing their productions.

Market liberalization under the globalization agenda is expected to open the door to more trade beyond the local markets. The expectation that liberalization will provide an opportunity for trade in areas of comparative advantage in different countries is, however, more complicated than earlier assumed. Nevertheless, growth in demand from the domestic and international markets for primary crops and processed food for all these markets creates a shift towards market-driven production in most countries.

A demographic change can drive profitability and access to premium markets. This also results in increased demand for quality food production. When there is a market, and the market is profitable, farmers tend to increase their production. Globally, the increase in urbanization and the growing urban middle class create high demand for food of a high quality with demonstrable nutritional content. Subsistence production makes it difficult to meet production demand in terms of quantity and quality for this niche market. This is a market that has high purchasing power and the capacity to pay a premium for quality produce (IFPRI 2017).

The utilization of modern technology and innovation has also been identified as critical to engaging in production for the market. However, currently, agricultural practices in SSA are virtually unmechanized. For example, in Nigeria, production is practically exclusively achieved through human labour which accounts for 90 percent of all farm operations (Oni 2012, 40). Current traditional agricultural practices are also rainfed and seasonal in most countries in SSA. The introduction of modern technology can, however, reduce seasonality in crop production (FAO 2017,12). This technology can motivate farmers to produce more crops at various seasons beyond rain-fed agriculture, thus increasing production and catering for the deficit in food production in SSA.

Policy is a key driver of agricultural activities. In general, where government policy is favourable, it encourages government participation and the allocation of funds in areas where the private sector may not be able to engage, such as the development of rural infrastructure. However, where government policy is not favourable towards the market, the situation changes, and smallholder farmers are less motivated to participate in, and focus on production for the market (FAO 2012).

3.3 Challenges of Production for Market

As desirable as production for the market may be, there are diverse challenges that confront such methods. There is a link between some of the structural factors that impinge on rural poverty discussed extensively in Chapter Two of this thesis and the challenges of production for the market. Bruntrup and Heidhuess (2002, 7) note that, despite several early interventions, many smallholder farmers remain engaged in subsistence or in partial subsistence production because of certain structural problems associated with agriculture. These challenges have included marketing challenges (Lee et al. 2012;12337), financial challenges (Cheru and Modi 2013, 21), and inadequate rural infrastructure. Others include inefficient extension services (Kumar et al. 2012,15; Kahn 2013,101) and inadequate access to modern technology (Kormawa 2015, 3; UNDP 2012).

Agricultural extension services are one of the key forms of institutional support expected to drive agricultural practices, particularly in developing regions. These could be the conduit for information, and training and support for smallholder farmers. Current agricultural extension services in most developing countries are, however, not able to provide the required support for the smallholder farmers to move from subsistence production to production for the market (Cheru and Modi 2013, 20).

To engage in production for markets, smallholder farmers need to know what to produce, when to produce it, who to produce it for, when and where to sell produce, and at what price (Kahn 2013, 10). Most extension services are ill-equipped to deal with the challenges of production for the market (Kumar et al., 2012 125), and are not able to support smallholder farmers beyond production for consumption.

Innovation and technology are also crucial in advancing from subsistence production to production for the market. Innovative technology is key to effecting improvements in agricultural productivity. It can play a key role in changing the face of agriculture in the SSA. In most countries in SSA, access to information communication technology is mostly limited to urban areas, and as a result of reduced access by the smallholder farmers, they have limited opportunities to access information such as the climate or weather that determines, to a

considerable extent the time of crop production and market information which could guide the profitability of farm products.

Diverse barriers such as biases and the cost of the technology often stand in the way of technology adaptation, no matter how novel it is (UNDP 2012, 73). If new technology adoption creates additional costs for smallholder farmers, they are unlikely to invest unless there are assurances, and proof that the end product will attract a premium payment above the use of the technology. The use of technology was noted as key to unleashing the potential of smallholder farmers to drive the success of the green revolution (Cheru and Modi 2013, 20).

All these challenges combined have made subsistence agriculture more attractive for most smallholder farmers who would otherwise engage in production for the market.

3.4 Agricultural Development Approaches and Support Systems in History

In the 1950s and 60s, the focus of most developing countries was on economic growth and industrialization for development. The agricultural sector was expected to support this process (FAO, 2010, 5). The assumption was that there were diverse surpluses from the agricultural sector, such as labour that provided a workforce for industrialization. Lower food prices, and foreign exchange that could be earned by agricultural exports or forced savings on agriculture that are transferable from the agriculture sector for urban industrialization also drove this growth (De'janvry 2010, 30). As part of these efforts, it became clear that smallholder farmers are critical to agriculture, and indirectly critical to the development of their regions (Dorward et al. 2009, 13). During this period, the state was central to the agricultural approach, "with a strong focus on land reform, investing in research and extension, stabilizing prices, providing access to inputs and credit, managing irrigation schemes, and coordinating rural development" (de' Janvry 2010, 31).

There was limited private sector involvement, which was partly due to perceptions about the capacity and the capability of the private sector to drive the growth agenda of the agricultural sector. The private sector was generally considered too weak to take on the task, with a lack of organizational capacity, poor access to capital and human resources, and little incentive to make large risky and unattractive investments in rural areas (Lundy 2002, 2; Dorward et al. 2009, 14).

State intervention during this period generally focused on price intervention (through input and finance subsidies and produce price stabilization and support) and organizational intervention (through parastatals, state-sponsored cooperatives, and agricultural finance organization (Dorward et al. 2009 14). The very high involvement of the state pushed by the World Bank and IMF as a policy condition for loans during this period, together with a lack of consideration

for private sector involvement along the agricultural value chain limited scalability. This approach was not sustainable, and during this period most state machinery in developing countries became weak (World Bank 1994).

Until the 1970s and early 1980s, most governments in developing countries retained import substitution and industrialization with strong anti-agricultural price policy biases (De'Janvry 2010, 17). "The main difficulties in implementing import substitution were: (i) obstacles imposed by the agricultural sector; (ii) problems with the balance of payments; (iii) lack of human capital; and (iv) little knowledge of technology" (Mendez et al. 2014).

By the 1980s, the government and public-sector dominant approach of the 1960s and '70s came under criticism because of the international oil crisis of the 1970s. This crisis arrested state-led development. Dorward et al. (2005, 80) noted that, during this period, large government expenditure in SSA did not lead to significant development. In an ODI report (ODI 2006, 7), it was noted that the limited impact of this expenditure was not limited to countries in the SSA alone, as a similar problem was identified in both Eastern Europe and Latin America. In these areas, very often "dynamics generated by large state involvement in the economy enabled politicians and bureaucrats to build a basis of political support by manipulating markets" (Bates 1981).

By 1982, the structural adjustment pushed by the World Bank and IMF was introduced to most of developing countries as part of the global economic agenda. Thus, the use of agriculture as an instrument of development was relegated in favour of other approaches to development, like open economic industrialization to accelerate growth and cash transfers, or workfare programs to reduce poverty. There was a focus on macro fundamentals to promote the role of market forces against the sectoral policies introduced under import substitution industrialization (De'Janvry 2010, 17).

The shift in the focus between the 1970s and the late 1980s relegated the agricultural sector to the distribution of resources by different governments. This resulted in a sharp decline of public investment and overseas development aid going into agriculture. Many agricultural support agencies like the agricultural development banks and parastatal marketing agencies also went moribund. During this period, most countries in SSA also started to experience food trade deficit (De'Janvry 2010,20; UNDP 2012, 37).

In the mid-1990s, many policymakers started re-evaluating the role of the State in their national development. This was based on the success recorded by several countries in Asia, particularly East Asia, through state-led approaches, from poor agrarian societies in the 1960s to producers of high technology and high value-added goods by the 1990s (ODI 2006, 8).

The 2000s saw a paradigm shift back to agriculture as a key means of accelerating development growth and reducing poverty in developing countries. De'janvry (2010, 21) stated that a combination of crises and opportunities brought about the re-emergence of agriculture in developing countries. He outlined the major crises that brought agriculture back to the limelight as:

- Rising food insecurity and hunger.
- Continued stagnation in sub-Saharan Agriculture.
- The high concentration of poverty in rural areas.
- Increasing rural-urban income disparities.
- Increasing resource scarcity globally.

This new approach recognized the role of the state, however in a greatly reduced form and as primarily on provision of the enabling environment and design of implementable policy (Lahiff et al., 2007, 1418; De'janvry 2010, 32; UNDP 2012, 12) This represented a major divorce from previous approaches whereby the role of the state was completely undermined, and private-sector participation was neither understood nor accepted as a key factor in driving the agricultural growth agenda to a hybrid that emphasized the importance of the role of the market and private-sector leadership. Nevertheless, it required the state to allow the market to perform efficiently by withdrawing from activities that could be managed by the markets (FAO 2010, 1).

3.5 Main Approaches to Agricultural Development

Over the years, diverse agricultural development practices have been adopted globally, and these approaches could be classified primarily as either state-driven or market-led. Dorward et al. (2009, 35) notes that the two policies are a reflection of different times in history. The first emphasised market failure in developing economies and encouraged state intervention to overcome them. The second highlighted state failures and encouraged the private sector to drive the market, and the withdrawal of the state from intervening in the market.

These two approaches also form the basis of many agricultural development practices in most developing countries. Although market-driven approaches are not new, recently, several agribusiness models have sought to fill that vacuum by developing new systems of support through private enterprises. Theoretical and empirical cases to understand the effectiveness of this model in enhancing structural support for rural development and poverty alleviation are, however, not yet robust. Boateng (2011, 1) noted that there is a weakness in understanding how agribusiness can support the tackling of poverty. Nevertheless, there is a growing argument that modern agriculture should be developed essentially in line with a market-based

economy supported by agribusiness. Greater understanding is needed for this, especially in the context of the developing countries (Kumar et al. 2012).

3.6 Interventions under State-led Approach

The traditional approach to agriculture globally and in developing countries, most especially after independence, is state led. This includes price interventions, either through subsidies or price setting, to stabilize prices, provide sufficient income for farmers and support infrastructural development. This helps government to engage in organizational interventions through parastatal and state-sponsored cooperative and agricultural finance organizations (Dorward et al. 2009, 36; ODI 2006, 16).

The state-led approach was adopted in both the Asian and African agricultural sectors in the second half of the twentieth century. It supported the green revolution in most Asian countries (Dorward et al. 2009, 36). Successes were notable in specific areas in Africa, such as in the development, release, and adoption of improved high-yielding varieties in the East and Southern Africa". Growth in production, cultivation, and the marketing of cotton, cocoa, groundnut and palm-oil in West Africa were also celebrated (Small and Jayne, 2003; Poulton et al., 2004). Nevertheless, the implementation of the state-led approach in post-independence Africa was only able to cater for a small number of the population in SSA and was not expansive enough for agricultural development in the SSA (Dorward et al. 2009, 28).

There was hostility towards the state-led approach during the early 1980s when SAP became the driver of development policies in many developing countries. Many critics noted that government intervention during this period was inefficient in both the local and international markets and this kind of protectionism did not allow for local competition and private sector growth (Dorward et al. 2005, 80; Veeman 2002;16). They also noted that, although there were results in some cases, the level of funding by the government during the state-led approach was not commensurate with the results that were achieved. They advocated for the state to have less involvement in the implementation of many development agendas, including agriculture.

Most existing state-led support collapsed under SAP, and the governments reduced public expenditure and support for public services. The shift in policy and practice under SAP created substantial institutional and infrastructural support gaps for agriculture, notably in developing regions (De'janvry 2010, 32). Nevertheless, some countries in SSA began to engage in some forms of state-led approach after the implementation of SAP due to the failure of the market approach under SAP.

There are diverse state-led approaches to agricultural development that have been adopted globally. Key among the approaches is price intervention, marketing boards, state-owned enterprises, and some agricultural cooperatives.

3.6.1 Price Interventions

One of the early prominent state-led approaches was price interventions, which took the form of price subsidies for producers and increased tariffs to reduce the importation of externally subsidized goods (Doward et al. 2007, 63). As far back as the 1100s, Britain has been using export taxes and licenses as a means of price intervention to protect food prices rising excessively (Anderson et al. 2010). Other countries, including those in the developed regions adopted one or more price intervention policies and practices until the late 1990s. Divergent approaches were adopted.

It is generally believed that price interventions are put in place to provide coordination in the agricultural sector, reduce risks faced by investors in the agricultural supply chain, and support farmers' income through price stabilization. Such interventions have, however been criticized for the role they play as protective measures on some countries, most particularly in developed regions (Bates and Block 2010).

It has been argued that protective measures in high-income economies have exacerbated inequality and poverty globally for a long time and have significantly affected the income of farmers in developing regions (Anderson et al. 2010, 4).

3.6.2 Agricultural Cooperatives

Cooperatives are believed to have been in existence for a little over a hundred years. They were established when the industrial revolution in the Western world became mature. They originated in Europe and spread to other industrialized countries in the early 19th century as a means of poverty alleviation through self-help (Hoyt 1989, cited in Ortmann and King 2007, 5).

Agricultural cooperatives were fostered by the idea of a social movement of farmers seeking to enhance and protect their operations. In most cases, they focused on the coordination of farmers and their activities and provided support in value-addition and created access to the market of member products. Ortmann and King (2007, 3) noted that in the cooperative arrangement, surplus income is returned to members based on the proportion of their patronage of the cooperatives rather than the proportion of investment or shares.

Agricultural cooperative societies are generally voluntary organizations which aim to cater to the needs of their members. They generally aim to increase membership, joint production and income with the expectation that they will link members to agricultural input, finance,

information, and agricultural marketing (Sifa 2014, 1). However, in some developing countries, cooperatives have strong government oversight or a presence that serves to improve the economic well-being of the farming community to alleviate poverty (FFTC Annual Report 2006, 2).

Unfortunately, and despite honest intentions government interventions can be construed as interference and can impede cooperatives. Nevertheless, diverse success stories have been recorded globally in terms of the use of cooperatives by the state to drive the agricultural development agenda. Sifa (2014, 1) notes that no African country has achieved a sustained and large-scale increase in staple crops as a result of cooperative actions, yet this assertion could be an over-generalization, countries like Ethiopia attain a high level of success in their cooperatives. He noted that farmers who are members of cooperatives perform better than those that are not, with a higher yield and premium prices of around 7–8% paid on staple crops marketed through the cooperatives (Wanyama 2008). Nevertheless, success is not widespread in Africa.

Decision-making in cooperative societies and the capacity to implement decisions in the interest of members is a complex, inherently difficult, and a problematic activity (Chibanda et al. 2009, Cornforth 2004). The problems inherent in the traditional cooperatives include free-riders, control, and influence, cost problems giving rise to doubt about the sustainability of these cooperatives. Osterberg and Nilsson (2009) found significantly higher levels of member disloyalty where members were dissatisfied with the management of cooperatives. This underscores the importance of a well-functioning democracy within cooperative governance. The more members that participate in cooperatives, the more they will be committed to it.

3.6.3 Marketing Boards

Marketing boards were common during the initial stages of the British Commonwealth in the 1920s. In the 1930s, there was a depression in the world commodity market when more countries, beyond the Commonwealth adopted marketing boards to stabilize market prices (Thomson and Terpend 1993,4). Royer (514), however noted that this is a partial argument that is generally given in the literature. He noted that, in addition to the reasons above, marketing boards were also established as a response to contractual enforcement failures arising from oligopolistic food processing and agricultural asset specificities.

Marketing boards are, in most instances, government agencies and non-statutory organizations that intervene in the marketing process to ensure the efficient and orderly marketing of agricultural products (Veeman, 2002). Royer (513) noted that, although there is no fixed typology of marketing boards in the literature, scholars provide two broad categories, namely, producer-controlled set ups, aimed at improving the bargaining power of producers,

and government-controlled set ups, motivated by government to protect the interests of consumers or to promote exports.

In SSA, the activities of the marketing board are concentrated on smallholder farmers, with a focus on price stabilization to protect farmers that are engaged in crop exports against price fluctuations in the global market (Hesp and Va der Laan 1985, 2). However, from the 1970s, most SSA governments increased the responsibilities of the marketing boards beyond price stabilization to include the production of protected crops by providing extended services, and to supply farm inputs and credits (Laan et al. 1990).

Although it was generally agreed that marketing boards were able to stabilize prices, the prices paid to farmers were substantially below world prices (Bates 2005). With the meagre income farmers received, the implication was that farmers gradually started losing interest in production. The surpluses generated by governments in most countries were not channelled back into the agricultural sector. They were, instead deployed towards industrialization and urban development (Tollen and Gibbet 2003; Bates 2005). In time, the marketing boards developed a reputation for egregious inefficiency that exploited farmers and discouraged agricultural production (Hubbard and Smith 1994; Bates 2005).

Marketing board adoption continued in a few countries in Africa until the late 1980s, when most national policies were driven by SAPs that required some reform of agricultural policies. This included the withdrawal of direct government regulations, and intervention in the market (Veeman 2002, 16). By the end of 1990, virtually all of the marketing boards in Africa had been partially or fully privatized (William 2009; Ayinde 2014).

3.6.4 State-owned Enterprises

State-Owned Enterprises (SOE) are often primarily owned by government or by Public-Private Partnerships (PPP), where a company or organization, as part of the government is run as a private entity with its own autonomous management structure and team. State-owned enterprises are generally practised globally and are an important aspect of most national economic development. SOEs could have both commercial and non-commercial value, and sometimes a combination of both.

Most developing countries adopted the practice of state-owned enterprise just after independence when they chose to convert most of the failing private sector enterprises into public enterprises to avoid an increase in unemployment (Nellis 1988). Several agricultural responsibilities were organised under diverse SOEs as nations became more nationalistic in their approaches after independence. Although traditional, most SOEs concentrated on the

local market. However, with the advent of globalization, many are now engaged in activities and business beyond their immediate environment.

As SOEs move beyond domestic markets to participate in the global market, it is sometimes granted a special privileged through “direct subsidies, concessionary financing, the state-backed guarantee, preferential regulatory treatment, and exemption from antitrust enforcement of bankruptcy rules” (OECD 2013, 6). Some of these special privileges could act as a barrier to market access for importing countries or for export competition when and where the countries implementing the SOEs require this.

From the 1980s, most SOEs in developing countries received scrutiny. Their efficiency was questioned, and most became unprofitable. They were considered to be a liability to government. Where they seemed to be profitable, they were heavily subsidized through hidden transactions, and preferential interest rates bestowed upon them by government. In general, they did not provide a return on their investment for governments in the developing countries. For example, in 1982, the Kenyan government estimated an average rate of return on its investment of US\$1.4 billion (1981) in SOEs. In 1963, a meagre 0.2 percent (Nellis 2005) of growth was recorded in Nigeria, and generally about 80% of SOEs operated at a loss (Eneh and Ndayako, 2009). The combined expertise required of both the public and private sector under the public-private approach was seldom evident. As part of the SAP policy, most governments in developing countries privatized their SOEs (World Bank 1997, 6).

During this period, these countries engaged in the privatization of SOEs with the expectation that service, and fund utilization was expected to be sourced with some success from the private sector. They also expected that governments would raise funds through privatization and utilize the proceeds from to develop other priority areas. This was, however, not the case in most countries, even in the most advanced ones, as the share of SOEs were under-priced (World Bank 1997, 3). As a result, most SOEs in the developing nations became moribund. For example, the Northern Regional Production Development Board was established in 1949 in Nigeria. Their focus was on the construction of feeder roads, the building of markets and abattoirs, and the provision of seed, fertilisers and dams. They were transformed into state ownership in 1955, with a change in management style. They moved away from a primarily government-controlled entity to become a self-governing entity. This change in corporate structure meant that the primary focus also changed to investment promotion and direct investment, particularly in agricultural development of the northern region of Nigeria.

By the 1970s, several subsidiaries including the Nigeria Agricultural Promotion Council emanated from the corporation. It supported agricultural investment and the establishment of agro-allied industries and provided agricultural consultancy services within its shareholding

states in Nigeria. However, like many SOE in developing nations, the initial high hopes of the enterprises was met with disappointment given the low returns on capital investment, and poor standards of management brought about by interference from political office holders (Evelyn 1980).

These four: price interventions, agricultural cooperatives, marketing boards, and state-owned enterprise are the key state-led approaches that were adopted globally, and that many nations of the world have adopted at different times in history.

3.7 Success and Failure of the State-led Approach

More than often not, the state-led approach was built on large bureaucracies that acted as a bottleneck to impede growth. The approach was also costly and created many financial burdens on the government because the primary focus was the welfare of people, rather than profit-making (World Bank 1993; Stiglitz and Yusuf 2001). However, it can also be argued that the available resources were well utilized because of rent-seeking amongst a group of small elites that made investments successively less productive. However, others argued that it was because the program of the state-led approach was poorly designed, and its implementation was not well thought out. It was suggested that this created many problems for the model. They also noted that most of the resources, particularly loans that were given to the smallholder farmers were not repaid because the plan that was put in place was not sufficiently robust and it was unclear how the loan would be collected (Lahiff et al. 2012, 1422).

However, some critiques noted that when these state-led approaches were abolished for market-led solutions, there were negative consequences in the developing regions. This was because there was an arbitrary increase in the price of commodities, and social services were reduced to sources of profitability that were beyond the reach of the poor (ODI 2006, 3). Most of the rural infrastructure that was available for agricultural development in SSA was built during the roll out of the state-led approach. It was believed that the limited funds available were channelled to support and subsidise the agricultural sectors haphazardly, and these created a half-breed rural infrastructure that did not meet the majority of the needs of rural areas (FAO 2015, 275).

3.8 Market-led Agricultural Development

Slater and Narver (1995, 67) provide a comprehensive definition of a market-driven approach. They suggest it is a culture that places emphasis on successful creation and customer value, while considering the interests of other key stakeholders. It provides norms for behaviour regarding organizational development, and responsiveness to market information. The approach works for profitable ventures in agriculture that bring the market and private sector

participation to the fore, in comparison to a state-led approach where the public sector was the key driver.

The market-led approach gained prominence in the early 1990s as a major alternative to the state-led approach that was the primary driver of agriculture for most of the 20th century. Many scholars have posited that the primary driver of the market-led approach was the adoption of SAP in the early 1980s (Lahiff et al. 2007, 1418). As one of the key recommendations, and as part of the implementation of SAP, many countries experimented with a market-led approach to agriculture, with reduced state function and advocacy for a private sector-driven approach. As part of the implementation plan, privatisation, liberalization, and deregulation of the market were promoted. The elimination of both input and output markets through subsidies, and the dismantling of agricultural marketing parastatals were discouraged (Dorward et al. 2009, 37).

The market-led approach under SAP implementation has received mixed reactions. For example, some countries benefitted positively from the implementation of SAP through the stimulation of growth in developing countries that are densely populated, with good infrastructure and diversified agriculture. One key example of such a nation is Bangladesh (Dorward et al. 2009, 37). This argument, however, did not consider the foundational role played by the state in institutional and infrastructural development before the implementation of SAP.

Most of the institutional sources of support for smallholder farmers were abandoned with the expectation that the market would assume the function of states and would drive the participation of the private sector (De'janvry 2010, 32). The shift in policy and practice to SAP in most countries, and mainly in SSA created a substantial institutional and infrastructural support gap for agriculture; especially for subsistence smallholder farmers that constituted the bulk of farming in developing regions.

It was also argued in a World Bank report (World Bank 2003) that private sector involvement was limited in terms of SAP implementation due to the long legacy of state-controlled and parastatal-managed markets. These led institutions and policy frameworks for liberalized and private sector market-led entities to be underdeveloped. Scholars have, however, noted that this argument presents an excuse that does not explain the failure of SAP, because the situation in most developing countries under SAP implementation worsened before its implementation (Oluwa 2012, 29).

Nevertheless, Lahiff et al. (2012, 1428) noted that, under a market-driven approach, the shortage of working capital was key to both the private sector and smallholder farmers.

The Liberalization of Imports and Exports

The common starting point for authors as to the issue of the liberalization of import and exports infers that the consequences of trade liberalization is positive across players or actors. This positive outcome may be true of the inherent nature of the idea of trade liberalization. However, a closer look at the specific results of this agenda reveals gaps and opportunities for improvement, most particularly in relation to negotiations on trade agreements, market reforms, and policy direction. This is especially the case in the agricultural sector of developing countries.

One of the key drivers of the market-driven approach is liberalization, driven by SAP in the 1980s as earlier outlined. During its implementation, many governments in developing regions assumed that smallholder farmers, through the market-driven approach, and under liberalization would be able to produce beyond subsistence and increase production for export. The opposite was true though, as many countries in SSA did not benefit much from liberalization. Most countries imported more food during this period, and most developing nations started to produce what they did not consume with the hope of exporting produce and earning foreign exchange. Again, in most cases, these countries imported and consumed what they did not produce.

Tariffs are not the only a barrier to trade. Non-tariff barriers are often more important in distorting the level playing field against developing countries in terms of international trade. It has been observed that, despite the preferential market access granted to most SSA countries by the European Union (EU) and US markets, the main obstacles that eroded the benefits of agricultural trade agreements in the Least Developed Countries (LDCs) were in the non-tariff areas (sanitary and technical issues) (Jean-Christophe et al. 2005, 5).

Meeting the various stringent international regulations and standards for trading in the international market became almost impossible. These stringent standards continued to act as a non-tariff barrier to trade, and as a protectionist tool or a means to bar agricultural importation from protecting a domestic agricultural market in developed regions (Maertens and Swinnen 2007). This approach did not create a balance of trade on imports and exports during liberalization in most developing countries, particularly in SSA.

Empirical evidence drawn from Kassim (2014, 2) also affirms the assertion that the removal or barriers to trade such as import tariffs, export duties, and quantitative restrictions, while stimulating growth, also pose a risk to the problem of the balance of payment, and place constraints on the output economy.

3.9 Agribusiness Model as a Market-led Approach

Agribusiness can be understood as a subset of a wider market-led agricultural development strategy. Its primary focus is said to favour sustainable delivery (from farm to fork) and strategy management (Davis and Golberg 1957; Desmond and Siebert, 2009). Much of the early work on agribusiness as a driver of agricultural value-chain development is attributed to Davis and Golberg (1957, cited in Tersoo 2013,19). They argued for the dynamics of private enterprise as the emerging source of basic price stability for farmers.

It was not until the early 1960s that the agribusiness concept became a popular strategy because of its perceived impact on raising the income of smallholder farmers. It expanded their operations from subsistence farming and allowed them to generate and increase both on- and off-farm rural employment from their abundant sources of rural labour. The impact on poverty reduction was also clear (Tersoo 2013, 17).

Davis and Golberg (1957) provided an early definition of agribusiness suggesting it is the sum of all operations involved in the manufacture and distribution of farm supplies, production operations on the farm, and strong processing and distribution of commodities and items. Others, however, noted that this definition is too narrow and restrictive. Agribusiness was further defined as the creation of a new organization that introduces a new product, serves or creates a new market, or utilizes new technology in a rural environment (Khan et al. 2012).

3.9.1 Historical Context of Agribusiness

Earlier agribusiness investment in developing countries was export-oriented and primarily focused on the sugar trade in the sixteenth century (Goldsmith 1995,1129). Early forms of agribusiness were followed by another era of export-oriented agribusiness with a key focus on more cash crops like cocoa, cashew, palm oil, cotton, and peanuts from the developing regions in the 1940s (Veeman 2002,18).

Recently, the agribusiness model gained popularity; this time as a market-led solution to agriculture. Although exports still play a crucial role in this new development, their re-emergence is primarily due to stronger demand for food crops locally, rather than just the exporting of cash crops that were the traditional export commodities (NEPAD 2013, 23). Nevertheless, global concern about food security also plays a major role.

The new agribusiness model is different from the previous version. Its focus is on an agribusiness approach at both the upstream and downstream of agriculture, rather than on the upstream alone. Early approaches focused on the involvement of the private sectors in the marketing of goods produced primarily for export, rather than the participation of the private sector in the production and processing of agricultural commodities (NEPAD 2013, 29)

The current approach focuses on all of the value chains along the demand and supply sides of agriculture. This complex and challenging situation, however, requires significant advances in agricultural practices that will be based on the strengthening of smallholder farmers; increasing their capacity to engage in the agricultural value chains and markets. This focuses the mind on how to reduce the risks associated with smallholding farming systems.

3.9.2 Description of Agribusiness in the Context of Development

The complexities and limitations of state-led development in agriculture necessitates a change in the methods that should be adopted in tackling modern challenges in the agricultural sector to come up with more novel approaches. To this end, farmers, agricultural business experts, researchers, and government have recognized the need for a culture that focuses on market-driven farming as a business and as one of the fundamental approaches required to tackling these challenges (McElwee 2005; Green et al. 2016,4).

Several scholars noted that agribusiness enterprise is acknowledged as an essential component of agribusiness that contributes to national development (McElwee 2005; Ahmad et al. 2011). This could enhance the integration of the poor into the global value chain; an essential prerequisite for poverty reduction (African Economic Outlook: 2014).

Philip et al. (2009) noted that the lack of private-sector involvement in agriculture over several years impinged on the growth expected through high productivity and income in the agricultural sector. Boateng (2011, 1) made a similar point; that the search for solutions to the scaling up of agricultural enterprise in Africa that are primarily rural and agriculturally based should be the central focus of policymakers, donors, and development practitioners in developing nations.

Both national governments and international donors have shifted their attention back to agribusiness as the driver of agriculture in the developing regions. This became necessary because of the assumption that agribusiness enterprise will provide the necessary support to strengthen entrepreneurship agriculture, and scale it up (Cheru and Modi 2013, 6).

3.9.3 Varieties of Agribusiness Schemes

Several varieties of agribusiness schemes have been practised in different parts of the world. Key among them is the out-grower scheme, which is sometimes referred to as contract farming. Felgenhauer and Wolter (2009) noted that out-grower schemes are an agribusiness approach accepted by many policymakers as a new development paradigm, linking smallholder farmers to markets. Prowse (2012), however, posited that the out-grower's scheme is not a new practice. He noted that some form of contract farming has been in

existence for close to 100 years, and it has re-emerged and expanded recently due to the recent drive towards market-led agricultural development.

The out-grower scheme is an agribusiness model that links diverse groups of unorganized smallholder farmers into a community comprising both domestic and international markets. It has been widely engaged in both the developed and developing countries to improve the coordination and performance of the agricultural market, and to address different kinds of market failures in general (Olomola 2010, 3). Some practitioners view contract farming as a means of policy measure by the state for crop diversification, and to improve farm income and employment (Singh 2000). Such a gesture could also facilitate better coordination of local production activities and reduced transaction costs associated with the market-led approach in agriculture (Key and Runsten 1999; IFPRI 2005).

Olomola (2010, 24) highlighted the key reasons why both farmers and companies engage in contract farming as (1) a lack of barriers to exit, (2) the positive impact on per capita income, (3) high demand for the product, (4) the prevalence of remunerative prices, and (5) favourable exchange rate policies. According to Jane and Samantha (2014, 1), out-grower schemes use several common approaches, or best practices, to address the challenges of contracting smallholders; in particular, employing organizational models that allow for high levels of farmer-company interaction to build trust and efficiently transfer knowledge and skills through:

- Securing buy-in and support from local authorities and community leaders.
- Providing training on good agricultural practices, directly or via third parties, typically leveraging lead farmer models.
- Utilizing formal contracts.
- Leveraging NGOs or other third-party support in program design and implementation, either at inception or when adding new program components.

Issues like weak legal system that complicate the enforcement of contracts in some of the developing countries where the operation takes place, and side selling by smallholder farmers have been identified as critical problems in contract-farming. It has also been noted that, in most cases, the poorest, and women are excluded from contract farming because of the focus on medium or large-scale farmers. This may be because of the access they have to resources such as finance, transportation, and land (World Bank/UNCTAD 2014). This was the case, for example for rice contract farming in Cambodia, where the poorest farmers were excluded and there was some public sector support to reduce transactional costs (Junning Cai et al. 2008).

The unequal power relationship between company and farmer has also been identified as one of the critical challenges with contract farming. Most companies that engage in contract

farming are foreign companies that focus on specific commodities for cash crops, in most cases with the aim of exporting to developed countries rather than producing for both cash and food crops (Abramovich and Krause 2014).

3.9.4 Drivers of the Agribusiness Model

The recent paradigm shift to the agribusiness model in most developing countries is believed to be driven primarily by four factors: the increasing population growth in the region, growing urbanization, swelling growth of the middle-class in many countries in SSA, and renewed interest in economic diversification across many countries in SSA (FAO 2016, 39).

“Those changes in demand will drive the need for significant increases in production of all major food and feed crops. FAO projections suggest that by 2050 agricultural production must increase by 70 percent globally—and by almost 100 percent in developing countries—to meet food demand alone, excluding additional demand for agricultural products used as feedstock in biofuel production. That is equivalent to an extra billion tonnes of cereals and 200 million tonnes of meat to be produced annually by 2050, compared with output between 2005 and 2007” (Bruinsma 2009, 25).

First, population growth is a major driver of agribusiness. There are over 1.3 billion people expected to be added to the population of Africa by 2050 (UNPD 2011; Population Reference Bureau, 2020). Since 1990, the population has expanded by 96 percent; more than double the world average increase of 38 % (FAO 2016). It is expected to grow by 91% between 2020 and 2050 (Population Reference Bureau, 2020) . There is a unique demographic structure to this growth, with more than 41 percent of the population under the age of 15 years (Population Reference Bureau, 2020).

As a consequence of its vast and fertile arable land, diverse primary crops are produced in SSA. Its production has, however, not met with the growing domestic demand from the region. Currently, most of the food in SSA is supported by food importation. The average growth rate of food importation is 5 percent, and the average growth rate in food production and food export stands at 2 and 1 percent, respectively (UNDP 2011, 32).

As the population increases, demand for food also increases, and this requires a novel approach to maximize the resources available in the region. Average per capita food consumption in SSA ranges between 0.7 and 0.8 tonnes of food per year (UNDP 2011, 32). Inadequate food production was and will be a major problem in developing regions. This challenge is driving many governments in SSA to start focusing more on a market-driven approach to agriculture that could be supported by the agribusiness model (IFPRI 2016, 60).

Secondly, along with population growth, growing urbanization is expected to put pressure on the already fragile global food system, as agricultural production comes under stress from diverse environmental and resource factors (IFPRI 2016,13). Urbanization is growing globally, but much more in the developing countries. Nearly 90 percent of projected urban global population growth will be concentrated in Africa and Asia, with China, India, and Nigeria alone expected to add 900 million urban residents by 2050 (FAOSTAT 2016).

SSA has grown from a continent with three cities with a population of more than half a million in the 1950s to a continent where in 1980, the cities of the same size had grown to 29 (Jelili 2012, 4). The urban population of the overall global population in Africa that was 43 percent in 1990, grew to 54 percent in 2014, is and projected to grow to 56 percent in 2050 (Brookings 2016).

This growth in most of the countries in SSA has created expanded markets for processed or convenience foods that require a lot of value-addition that could mainly be achieved through an agribusiness approach (Maertens et al. 2014, 10). In a NEPAD report (NEPAD 2013, 21) it was noted that there is market dynamism in Africa, and many urban dwellers, and even some rural dwellers are purchasing some processed foods from markets. This is, nevertheless, very new, with a strong need for improvement in the quality of processed foods, and the need to better organize the market to meet growing demand. There is also a need to keep up with changes in consumption patterns that can only be matched with well-structured agricultural practices found mainly in agribusiness models.

Thirdly, the rise of the middle classes is also contributing significantly to agribusiness growth. As the population, and urbanization increases, so too does the growth of the middle class in SSA. The most recent data shows that the segment of the population classified as middle-class in SSA comprises some 313 million. This is triple what it was 30 years ago. The growth rate of this class was 3.1 percent between 1980 and 2010, compared to an overall population growth that stands at 2.6 percent growth in the continent at the same time (AfDB 2011). The middle classes now make up 35 percent of the total population in Africa, with an increased income level of between US\$4 and US\$20 a day (NEPAD 2013, 15). The link between urbanization and income is best illustrated by recent statistics that show that only one-third of the African population lives in the city, and that segment accounts for 80 percent of its GDP (Deloitte 2012, 5). In a recent Harvard Business Review (2018, 26), it was pointed out that consumer spending in Africa rose from US\$470 billion in 2000 to more than US\$1.1 trillion in 2016. This is primarily associated with growth in the middle classes in the region.

Along with the higher income level comes a change in dietary composition. This class tends to seek food with of a high quality and with unique attributes. Such foods are, in most cases,

manufactured outside of SSA (IFPRI 2016, 62). For example, 41 percent of the food budget in SSA in 2010 was spent on processed foods primarily produced and imported from developed countries, and this has been associated with growing dietary changes by the middle classes (UNDP 2012, 40; FAO 2016, 65).

The population's diet is a great determinant to the kind of food that is produced in any society. This demand actively changes trends in production to include diversification and increases in the production of some crops. The current change in consumer tastes and needs means farmers face different challenges and opportunities than those faced by previous generations of agriculturists (Micheal and Gow 2013, 21).

Growing demands in urban areas with populations that have disposable incomes could create a market for smallholder rural farmers and vice-versa (IFPRI 2016, 15). This market entails the production of food that could require value-addition, branding, packaging, and diverse marketing channels. This kind of approach requires the kind of knowledge and skills that are only currently being displayed through agribusiness, which focuses not just on increasing quantity but also on understanding quality products that include the nutritional compositions required in a modern market.

Lastly, globalization has also opened the doors of sovereign countries to a more global community. To respond to global demand, most countries in SSA also want to engage in international agricultural trade. The region has, however not traded equitably in international markets despite a growing global demand for food, because its major participation in global markets relates to the export of unprocessed crops. These provide less revenue than processed and value addition commodities. For example, less than 6 percent of African cotton and 25% of cocoa is processed before export (NEPAD 2013, 29).

These factors have affected trading volumes consistently between SSA and the rest of the world. While the volume of food trade between SSA and the world was 14 percent between 1983 and 1993, it saw a decline to 8 percent between 1993 and 2003 and was worse off between 2003 and 2008 when it grew by just 2 percent (UNDP 2012, 4). Global competitiveness requires investment in bottlenecks to make progress in agriculture. Meeting all these daunting challenges becomes a key issue that the governments of developing nations, particularly in SSA, have focused on. Many must rethink their approach to agricultural practices to consider a model that is more market driven.

Meeting this stringent global standard requires specific expertise in the production of quality and increased quantity of crop production. It will also require strong agribusiness and management knowledge and skills along the value chain (Maertens et al. 2014, 6).

3.9.5 Success and Failure of the Market-led Approach

Micheels and Gows (2013, 25) argued that several studies have shown that a market-led approach can lead to higher performance for the actors across the value chains. The market-led approach creates timely and efficient market information that can guide both efficient production and effective market linkages of production. It also brings about new marketing system structures, such as modern cold room facilities to improve perishability (IFPRI 2016, 43). The ability to quickly respond to this market information, and the new system can enhance the competitive advantage and profitability of agricultural producers.

As the demand for food production is increasing globally, the size of arable land is also shrinking due to factors which include environmental degradation and unsustainable agricultural practices. There is thus the need to intensify cultivation in the form of yield increases and higher cropping intensities rather than just increasing the use of land. Diverse technologies and approaches will be required to achieve this objective, as they have only been accessed under the market-led approach.

Although there is disagreement as to the costs of getting involved in market-led production (Harris and Piercy 1997), there are benefits that have been noted in the wake of the successful implementation of such an approach. The market-led approach has helped farmers to realize high returns on their produce, minimizing production costs and improving product value and marketability (Kumar et al. 2012, 128).

The market-led approach is also improving the growth of the market for quality productions across all value chains in developing countries. In a recent IFPRI (2016, 43) study on how cities are reshaping food systems, it was noted that there is a quiet revolution affecting staple food value chains in developing regions. Branded and packaged foods are expanding, urban residents are increasingly eating away from home, and the focus is more on high-value crops rather than just staple foods. This is driven by the re-emergence of market-driven agriculture.

Some of the failures associated with the market-led approach include the high costs of agriculture because, in most cases, the operation is not subsidised, and where finance is not available, the farmer's ability to operate is limited. As such, they do not achieve maximum results in production due to a lack of access to the quantity or quality of input required. Infrastructure decay is another issue associated with market-driven approaches as experienced during the implementation of SAP.

This chapter reviewed the diverse approaches to agricultural practices, the subsistence nature of agricultural practices with its associated implications for production for market and the development of the agribusiness model in agricultural practices . The next chapter will

examine the contextual details of rural poverty. It also examines emerging discourse in agricultural practices and considers the contextual development of an agribusiness model to support agricultural practices in Nigeria.

Chapter 4: Background to the study – Rural Poverty and Agricultural Development in Nigeria

4.1 Causes and Trends in Rural Poverty in Nigeria

One of the targets of reducing poverty in Africa and Nigeria is to reduce the proportion of people living in absolute poverty (World Bank 2013) and eradicate poverty in all its forms by 2030 as part of its commitment to the Sustainable Development Goals (UNDP 2018). The poverty trends in Nigeria, however, are not so different from those experienced in SSA where the rate of US\$1.90 a day incidence of poverty has not shown a sustained decline (World Bank 2018). Although Nigeria has experienced considerable economic growth for several decades, it remains the country with the highest number of extreme poverty in the world (Brooking 2018).

Poverty in Nigeria is primarily rural-based and closely linked to agriculture. Evidence from the literature has shown that most poor households in Nigeria in the agricultural sector (Ewuim 2010; Etim and Udoh 2013, 142; Apata 2014, 14). When poverty is disaggregated between the rural and the urban, rural areas in Nigeria have a more significant share of poverty (Omonona, 2010, 1 NBS,2019).

There have been attempts in recent decades to alleviate poverty through policies, especially in rural areas (Ugoh and Ukpere, 2009, 847; Chukwuemeka, 2009, 406). Despite these interventions, poverty in general, particularly rural poverty, is still very high. Many attempts to develop rural areas have not been successful (Adeoti, 2014). Currently, close to 50 million Nigerians in rural areas remain classified as poor (World Bank, 2015; IFAD, 2015).

There are diverse factors that have been identified as key constraints in alleviating rural poverty in Nigeria. Some of these factors are closely linked, and similar to the constraints experienced at the global or regional levels, while some are unique to the country context.

4.1.1 Political Context

Nigeria's population in 2020 stands at 210 million (World Bank, 2020), making it the most populous country in Africa, and the seventh largest in the world. Its rural population was 95 million in 2017 when the last data on rural populations was available. This accounted for 50.5% of the total population of Nigeria in the same year (World Bank 2020). Based on current trends, the average growth of 2.6% in the population means it is projected to reach 300 million by 2050.

Although Nigeria claims to practice a federalist structure, a political concept in which the power to govern is shared between national, state, and local governments, the long years of military rule have distorted the original plan of federalism. In theory, Nigeria practices democracy as a means of governance. It has three separate arms of government: (a) the Executive, with an elected president and a federal executive council appointed by the President but screened

and ratified by legislators, (b) the Legislative arm, which comprises legislators at the upper chamber (Senate) and the lower chambers (the house of representatives). This body jointly administers laws and policy; and (c) the Judiciary that interprets domestic legislation. This structure has been in place since 1963.

As a federal republic, Nigeria has 36 states and a Federal Capital Territory. It also has 774 local governments across all the 36 states. Nigeria is divided into six geopolitical regions, namely South-South, South-East, South-West, Northeast, Northwest, and North-Central. Each geopolitical region has six states except for the Southeast and the Northwest with five states and seven states respectively.

There are three major ethnic groups in Nigeria: the Yoruba predominantly in the Southwest, Igbo in the Southeast, and Hausa in the North. Although these groups are in the majority, there are several other minority ethnic groups across Nigeria.

4.1.2 Economic Growth and Poverty in Nigeria

Historically, GDP growth in Nigeria has been favourable. Between 1961 and 1970, the average growth rate of the real GDP was 5.1%. It dropped to 1% between 1981 and 1990 but rose again to 5% between 1991 and 2000 (CBN 2001). Besides economic growth, Nigeria is also well endowed with high natural resources, fertile land, and human resources.

In 2014, Nigeria became the largest economy in Africa with a Growth Domestic Product (GDP) of 6.3 % in 2014. Nigeria is the 6th most productive oil producer, and 7th biggest exporter in the World. Nigeria's GDP was rebased between 1990 and 2000 (UNDP 2014, 8; African Economy Outlook 2014, 2). The economic growth of 2014, and overall performance in GDP have been largely attributed to growth in the non-oil sector.

The Nigerian economy accounts for 55 percent of the economy in the West African subregion (Kanayo 2014, 201), with real GDP growth of 5.4% in 2011, 8.3% in 2012, and 7.8% in 2013. This growth most notably took place in the agricultural sector through crop production. From the first quarter of 2015, the Nigerian economy has been experiencing a downturn. Its GDP growth declined to 2.7% in 2015 (World Bank 2015). By the second quarter of 2016, Nigeria's GDP in real terms decreased by 2.06%. Despite the misfortune of its overall economic growth, in real terms, in 2016, the non-oil sector contributed 91.74%, to the nation's GDP and the agricultural sector contributed 20.48% to this. This contrasts with the oil industry, which contributed 10.29% (NBS 2016, 5).

The economy eventually went into recession later in 2016, (NBS 2016, 2). The decline in economic growth in Nigeria has partly been blamed on the mismanagement of financial resources over an extended period. As a result of its limited economic diversification, the

insurgency in the oil-producing regions led to lower outputs in oil production. In addition, ineffective fiscal and monetary policies impacted negatively on the exchange rate, and increased inflation.

The economy recovered and recovered from recession with slow growth of 2.9% in the second quarter of 2018 (CBN 2018). This growth was based on improved oil prices and production and particularly stronger agricultural sectoral performance contributing 36.6% to growth across all sectors (AfDB 2018). The Nigerian economy recorded the slowest first -quarter growth since 2016 (post-recession) with just 1.87% growth in real GDP. This slow growth has been attributed to the COVID-19 outbreak that impacted on the global economy and the oil price war between Saudi Arabia and Russia (PWC 2020). The economy however declined back into recession in the later part of the 2020.

Regardless of this slow growth, agriculture's contribution to GDP continues to be important to Nigeria , although it contracted in 2018 and 2019 due to the impact of the herdsmen-farmer crisis across the country (World Bank 2018). This contraction was also attributed to a global oil crisis. It does, however, continue to contribute about 22% to GDP (Q1 2020), and accounts for 57% of domestic consumption expenditure (PWC 2020).

Despite all the economic growth harnessed through its abundant resources at different times, the poverty rate in Nigeria is still very high, and most notably in rural areas (Etim and Udoh 2013, 142). The poverty and economic growth paradox in Nigeria is not new (Apata et al. 2010, 85; Iwala 2014, 13). Although poverty has continued to persist since the colonial era in Nigeria, things did not get better, even after independence (Abass 2012, 101). The post-independence era and the subsequent increase in revenue due to the oil boom in Nigeria between 1973 and 1980 did not particularly translate to a major development in Nigeria. Rather, its mismanagement exacerbated the problem of poverty in Nigeria.

4.1.3 Understanding and Measuring of Poverty in Nigeria

Both unidimensional and multidimensional approaches have been adopted to measure poverty in Nigeria. Using both measures reveal diverse poverty in different contexts. Measurements such as relative, absolute dollars per day, and multi-dimensional approaches have been adopted at different times in the past in Nigeria. Although there is no single, perfect poverty indicator, US\$1 and recently US\$1.25 a day as arbitrary poverty lines are thought to provide an adequate approximation to the other dimensions of poverty at national and regional levels of aggregation.

Nevertheless, in the most recent Harmonized Nigeria Living Standard Survey 2009/2010 (HNLSS) assessment of poverty in Nigeria, a follow-up to the Nigeria Living Standard Survey

conducted in 2004, four significant approaches were adopted to provide a detailed evaluation of poverty in Nigeria (NBS 2010, 5 and 9).

These include relative poverty measurement approaches which refer to household expenditure which covers all goods and services for use in the household. It also consists of all monetary transactions, e.g., donations and savings and so on. This definition considers expenses above or below N66,802.20. The absolute (objective) poverty measurement approach that refers to the used measurement of per capita expenditure approach considers food and non-food expenditures below or above N54,401.16. The dollar per day measurement approach considers all individuals whose expenditure per day is less than a dollar per day using the exchange rate of Naira to Dollars (NBS 2010, 10). Finally, the Multidimensional Poverty Index and the United Nations Development Program (UNDP) Human Development Index (HDI) are also adopted as critical measures of poverty in Nigeria (Ajadi 2010, 351).

The rate of poverty at both national and regional levels has increased (Ogbeide and Agu 2015, 440). The National Bureau of Statistics (NBS), the government coordinating body for all the national statistics, noted that the national poverty rates that were 27% between the 1970s and early 1980s increased sharply to 46.3% in 1985 and 62.6 % in 1996. The population in poverty also increased from 17.7 million in 1980 to 68.7 million in 2004 (NBS 1990 and 2005).

The situation has not changed in recent years, and poverty reduction and economic reform are the most significant challenges facing Nigeria today (Etim et al. 2010). If we use different parameters of poverty in Nigeria, most of the current data shows that the poverty rate remains high (Igbalajobi et al. 2013, 131).

Poverty measurements currently available in Nigeria attest to the growing incidence and increase in the depth of poverty in Nigeria. The measure of relative poverty, which is defined by the standard of living of the majority in a given society for Nigeria, was 54.4% in 2004 but increased to 60.9% in 2010. The absolute poverty rate defined according to the minimal requirement necessary to afford minimum standards of food, clothing, healthcare, and shelter in Nigeria was 54.7% in 2004, but this increased to 60.9% in 2010.

Dollar per day measures show that 51.6% of Nigerian were living below US\$1 per day in 2004, but this rose to 61.2% in 2010 (Osundina et al. 2014, 2). Of those who lived on less than US\$1.25 a day (64.41% in 2003/2004) in Nigeria, the number increased by 68% in 2010, while the population living on US\$1.90 a day stood at 53.5% (UNDP 2019). The population living below the national income poverty line in 2019 stands at 46% of the total national population of 173 million people (UNDP 2019).

Multidimensional poverty in Nigeria in the most recent survey that is publicly available for Nigeria Multidimensional Poverty Index (MPI) 2019 shows that 51.4% of the Nigerian population are multidimensionally poor, while an additional 18.4% live near multidimensional poverty (UNDP Human Development Report 2019).

The United Nations Development Program (UNDP) Human Development Index (HDI) in 2014 noted that Nigeria's value was 0.514. This value placed the country in the category of low human development countries in 152nd position out of 188 countries and territories under the HDI. This compared with its position in 2002 which was 121st (UNDP Human Development Report, 2015; World Bank, 2018).

The unemployment rate in the country has also increased from 2.3% in 1980 to 18.1% in 2000. Although this dropped to 11.8% in 2004, it rose to 21.1% in 2010, and to 25% in 2012 (Ogbeide and Agu 2015,440).

In the 2018 report of the American Brooking Institution, it was revealed that Nigeria had the highest rate of extreme poverty in the world, increasing at a rate of six people every minute. These data require serious attention, and they should motivate the Nigerian government to review its approach to poverty.

Although multi-dimensional approach and international poverty line of dollar per day measures has been suggested in some literature as the most extensive means of measuring poverty as outlined above, nevertheless for this research, the national poverty line will be adopted in the poverty estimation. the national poverty line typically reflects the reality of the different country context when compare to international poverty line. Falkingham and Namazie (2002) noted that international poverty line should be seen as a supplement because it seems to be more effective in comparison of poverty across countries rather than within a country. Accessing most of the multi-dimensional resources are also partially dependent on individual or family disposable income, most especially in the developing countries like Nigeria where social safety net that could contribute to the multidimensional poverty alleviation among the poor is at the minimal.

4.2 General Causes of Poverty in Nigeria

Several complex factors contribute to incidences of poverty in Nigeria, both directly and indirectly (Chukwuemeka 2009, 407). Critical amongst the causes of poverty in Nigeria is prolonged military rule, poor management, uneven distribution of the country's abundant resources, and neglect of the agricultural sector in favour of oil (Nkwede 2014, Eminue 2005, and Igbuzor 2006). Scholars have identified inappropriate macroeconomic policy, low productivity, and low wages in the informal market as factors that further exacerbate poverty

in Nigeria (Eneh 2011, Oluwa 2012, 32). In a World Bank 2020 report, it was mentioned that subsistence approaches to agricultural practices in Nigeria are a major driver of poverty in rural areas.

4.2.1 Inappropriate Macro-Economic Policies

Economic growth should ordinarily support a reduction in poverty. Suitable examples of countries with economic growth and poverty reduction correlations are Indonesia and Thailand. These two nations reduced poverty by 20–30% during the 20-year period in which the annual economic growth rate was around 3%. However, India and Sri Lanka saw minor economic growth at just 1% and this created very little reduction to poverty levels over the same period (Olowa 2012, 7).

Similar impacts between economic growth and poverty were, however, not experienced in Nigeria. Ironically most of the essential factors leading to recurring poverty in Nigeria, such as limited economic diversification, inadequate physical infrastructure, and weak accountability systems take centre stage (UNDP 2014,8). This was particularly the case during the growth of the oil sector that became the dominant economic powerhouse following independence.

Prior to independence in Nigeria in 1960, the economy was primarily driven by agriculture, The contribution of agriculture to the Nigerian economy was, however, undermined with the discovery of oil in 1973. The oil sector took over as the primary contributor to economic growth, and Nigeria became overdependent on the oil sector. It therefore failed to engage in the diversification of its economy (Ucha 2010 52; Ejumode and Ejuvewekpokpo 2013, 70 and Oluwa 2012, 34). Ideally, the discovery of oil should have been a blessing to the country because it could complement the role of the agricultural sector. However, because of misplaced priorities, short-sightedness, and greedy policymakers during this period, attention was shifted almost wholly towards the oil sector. This occurred to the detriment of the crucial sectors, including agriculture. By 1984, the oil sector accounted for 97% of the country's export earnings (Agbaeze et al. 2015, 4).

In addition to the lack of diversification, oil exploration in Nigeria primarily focused on the export of crude oil without minimal processing and the kind of value addition that could support more revenue generation and employment creation. Over the years, oil sector revenue was not cautiously utilized, and government failed to channel the proceeds from oil exploration equitably to both urban and rural regional development. Such an approach might have stimulated a level playing field in both areas. Instead, a gross level of misappropriation of revenue occurred, and there was little infrastructural development to celebrate when it came to revenue from the oil sector.

According to Ucha (2010, 52), the oil boom of the 1980s in Nigeria led to excessive borrowing and spending on wasteful projects. It was dominated by high-level corruption. This severely affected the economy and when the price of oil crashed across the globe in 1986, Nigerian oil revenue reduced dramatically, and external debt increased considerably, the nation's citizens were further plunged into poverty. The already meagre budget allocation to rural areas reduced to the further detriment of the rural economy.

4.2.2 Impact of Population Growth

Although it has been argued that population growth could be an advantage to national economic growth, if it is not well harnessed it can become a burden to the economy. In Nigeria high population growth has also been attributed to high levels of poverty (Ugho and Ukpere 2009, 849).

The annual population growth rate in Nigeria as of 2017 stood at 2.6% (World Bank 2020). The population of Nigeria is forecasted to be amongst the six highest countries in the world by population growth, and the only country in Africa expecting a population above 300 million in 2050. This growth is attributed to diverse factors that include improvements to life expectancy from 40 to 51 years, and a decline in infant and child mortality, most notably in urban areas (UNDESA 2015). Other factors, like high fertility rates in Nigeria are also significant drivers of population growth. Nigeria has one of the largest fertility rates in the world, with an annual average of 5.3 children per woman. This compares with SSA which has a rate of 4.4 children per woman in 2020 (Population Reference Bureau, 2020). A high percentage of the rural population in Nigeria is also illiterate and has poor morbidity, as well as poor birth control systems. These factors have impinged on sporadic growth in the population.

There are demographic consequences to population growth in Nigeria. In the last official census held by the Nigeria Population Commission (NPC 2001), it was noted that youth under the age of 30 years constitutes over half of the total population. The census also showed that children below the age of 15 years accounted for about 45% of the country's total population (UNICEF 2014). Ideally, this segment of the population is supposed to be the future workforce that will drive national economic development. This is however not the case in Nigeria, with 40 percent of children between the ages of 6 and 11 not attending a primary school. Some children do not attend school at this early stage because their labour is needed to bring additional income into the family home. Occasionally the families can simply not afford to pay for other cost associated with their education (UNICEF 2014). The vast majority of these youth are also unemployed. NBS (2018) shows that the level of youth unemployment stands at 52.6%. The vast majority of this youth survive on the few resources available from their parents, and this creates a burden on the family, plunging them into further poverty.

4.2.3 Impact of Globalization and the Structural Adjustment Program

Globalization could bring about development or retrogression to any nation, depending on the nation's capability to assess the identified benefits that can be accrued (Sen 2002). It has become a significant force in creating a global market beyond the sovereign State. Ewere (2014,127) referred to this process as one that creates transcendental homogenization in the world.

Omolade et al. (2013, 6) noted that Nigeria's globalization experience is disappointing, primarily due to its impact on the nation's performance measured through its GDP and growth. This is because Nigeria entered the global market at a competitive disadvantage because of its focus on a mono-economy. Others like Ogbuaku et al. (2006) have a slightly different view of the impact of globalization on Nigeria. They pointed out that all was not gloomy in terms of globalization in Nigeria. Indeed, under globalization, Nigeria benefited from a lot of Foreign Direct Investment (FDI) and advanced technology, most notably in the area of telecommunications, which has had an enormous positive impact on the nation's economic growth.

Nevertheless, the general view amongst many scholars was that globalization has not impacted positively on poverty in Nigeria. Indeed, globalization has created negative consequences for the balance of trade in Nigeria and has reduced the capacity of local manufacturers to support the growth of domestic industries. It has, at best, restricted local traders to mere producers of raw materials, and consumers of manufactured products (Konyeaso 2016).

Access to markets through globalization has paved the way for international agricultural trade around the world, which makes it more difficult for farmers in countries like Nigeria with less poorly developed agricultural sectors to compete locally or internationally. International trade exposes local producers to fluctuations in global prices for the crops they cultivate and consume (Taylor et al. 2009, 4).

The participation of smallholder farmers in the global market through market liberalization is also not equitable. Some of the trade rules relating to agricultural commodities have been criticised as biased towards the development of the agricultural sector in the developed regions. This occurs to the detriment of smallholder farmers in developing regions primarily because of unfair subsidies (compared to SSA) that are paid to agricultural producers in the developed regions (FAO 2012, 22). Compliance with these international trade rules that often require financial, informational, and network resources that most smallholders' farmers do not have (Lee et al., 2012, 12327) has limited the capabilities of smallholder farmers in Nigeria to participate in the global market.

In addition to this, as part of the globalization process, from the 1980s, diverse reforms, policies, and programs were introduced under the SAP in Nigeria. The critical component of SAP that was introduced was the liberalization of the financial, commodity, and labour markets. Privatization was encouraged throughout the private sector and the reduction of government interference and social safety nets expedited this process. This SAP policy forced the government to reduce its allocations to, and attention towards rural areas which hosted a high percentage of the country's population. As a result, of the reduced allocation of budgets and resources to the rural areas, this neglect further affected the rural infrastructure, and the interests of smallholder farmers in agriculture continued to dwindle (Osundina et al. 2014, 2). Consequently, the agricultural sector's contribution to GDP dropped from 60% in 1960 to 31% in early 1980 during the period that SAP was implemented in Nigeria (Oduwole and Fadeyi 2013, 110).

Overall, the increase in the poverty rate from the 1980s (see the general poverty data in this thesis, page 35), has been strongly attributed to the impact of SAP implementation around that time. This implementation created biases towards urban development to the detriment of the rural areas, amongst many others. To a greater degree, SAP increased its woes and plunged the nation further into poverty.

All these multifaceted issues have made the eradication of poverty a daunting task in Nigeria (Adejuwon and Tijani 2012).

4.3 Disaggregation of Poverty in Nigeria

There is so many disaggregation that could be achieved when poverty is analysed. However, when poverty is contextualized to the Nigerian context, the geographical distribution of poverty, and urban and rural division become very crucial to understanding poverty.

4.3.1 Geographic Distribution of Poverty in Nigeria

In Nigeria, poverty has a geographical dimension (Ugho and Ukpere 2009, 850). When poverty is disaggregated by regions, three geopolitical areas of the Northern regions of Nigeria (Northwest, North-Central, and Northeast) stand out more than the other three areas in the Southern regions of Nigeria (Southwest, South-South, and Southeast). Between 1996 and 2004, all the geopolitical regions in Nigeria witnessed a reduction in the incidence of poverty, except for Northwest region which saw growth from 72.7% to 76.4% (Omonona 2010, 2).



Figure 4.1: Nigerian map with geographical disaggregation.

Source: Akinyemi et al 2015

Most recent poverty measures also show a similar trend. As shown in Table 2.1, the Southwest region of Nigeria has the lowest poverty rate at 14.20%, after a significant reduction in its poverty rate from 34.4 % in 2004. However, the Northwest of the country recorded the highest poverty rate at 59%, which is a marginal decrease from the 2004 figure of 61.4% (World Bank 2016, 101–122).

Table 4.1: Poverty rate by different geopolitical regions in Nigeria between 2004 and 2013

| Zones | Poverty rate: 2004(%) | Poverty rate: 2013(%) | % Change |
|---------------|-----------------------|-----------------------|----------|
| North Central | 56.1 | 38.8 | 30.8 |
| Northeast | 45.5 | 47.6 | 4.6 |
| Northwest | 61.4 | 59 | 3.9 |
| Southeast | 36.9 | 29 | 21.4 |
| South-South | 38.3 | 24.7 | 35.5 |
| Southwest | 34.1 | 14.2 | 58.4 |

Source: World Bank Report. 2016. Poverty in Nigeria in the last Decade.

Diverse factors have been attributed to the high regional poverty levels in these regions such as low levels of education and literacy, a growing population, civil unrest, and high levels of inequality and unemployment, among others.

Nigeria is prone to conflict due to its ethnic and religious heterogeneity. There has, however, been more conflict in the northern region of Nigeria, most especially in the Northeast from 2000. There was an average of 102 conflicts per year in the North East, compared with 47 in

the Northwest. There were 81 in North Central, 69 in the Southwest, 91 in the South-South, and 28 in the Southeast between 2000 and 2015 (World Bank 2016, 95). Iwala (2014, 14) rightly pointed out that the terrorist activities of the Boko Haram in the Northeast region of Nigeria that largely contribute to the destruction of already dilapidated infrastructures paralyzed the economic operations of the region. The agricultural community suffered notably, and these actions exacerbated poverty levels in the region.

The unrest in most of the states in the oil-producing areas of the South-South region of Nigeria that were exacerbated in 2015 continues to hurt the Nigerian economy. It has plunged the South-South region into further poverty as pipeline vandalism has impacted on the socio-economic activities in this region. This has impacted on the livelihoods of the rural community which depends on agriculture and fishing as a source of income (World Bank 2016).

The issue of literacy has also impeded the high rates of poverty in some regions in Nigeria. There is a correlation between poverty levels and education at various levels and this seems to be the case with poverty disaggregation in the geopolitical regions in Nigeria. The northern geopolitical regions in Nigeria with high poverty indicators also have low education and literacy levels in all cases. The most educated workforce employed in Nigeria comes from the southern region, and particularly the Southwest (World Bank 2020).

In a UNESCO (2012, 3) report, it was shown that, of the 37 states in Nigeria, 17 have a literacy rate of 49.3%. The majority of these 17 states are in the three northern regions in Nigeria with the highest poverty rates. The combined three northern regions have a grey 34% literacy level compared to the three southern regions, with 67% literacy rates (UNICEF 2015). The problem of low literacy rates in the northern part of the country does not seem to have anything to do with an equitable allocation of resources for education. Instead, it can be traced to a political will to prioritize education in the regions by the political class. For example, the three geopolitical regions in the North have a total of 41,913 public primary schools, more than twice the number of public primary schools in all other regions in the South (The Cable 2017).

The population living in the Southwest region of Nigeria is also more likely to have completed primary school than its counterparts in the whole of the northern Nigeria. Nevertheless, of all the three regions in the northern area, the Northeast states have the lowest net primary school completion ratios. Less than 10% of the populations in Adamawa, Taraba, Yobe, and Bauchi, and all in the Northeast regions have completed primary school (World Bank 2016).

If the trend continues, education levels in the Southern region, and particularly in the Southwest are likely to spur even faster economic growth, greater development, and increased poverty reduction in the future as trends in emerging markets globally would suggest.

Population growth also plays a major role in the disparity levels of poverty in the different regions of Nigeria. Although the population is generally growing in Nigeria, the contribution to growth is, however higher in some regions of Nigeria compared to others.

The persistence of population growth in these regions has been associated with some of the predominant cultural practices and beliefs in the area, most notably early child marriage and disposition towards birth control. For example, 69.1% to 90% of women aged 20–24 in seven of the 15 states in both the Northeast and West regions of Nigeria were married before the age of 18 years. Some 48% to 64.9 % of women in the other 8 states in both regions are married during the same period, while just around 5.9% to 30% in all states in the Southeast and West were married at the same time (UNFPA 2013).

The average birth per woman in Nigeria is 5.7. The Northeast alone has an average of 7.2, with 3.2% of the population aged between 14 and 49 years in the Northeast. Only 4.3% births per woman occur in the Northwest and 15.6% in the North Central use any form of family planning, compared to 38% in the Southwest. This compares with 29.3% in the Southeast, and 28.1% in the South-South (NDSH 2013 29).

The region with highest population growth in Nigeria has the highest levels of poverty. Most particularly the Northeast and Northwest regions are implicated (see the geopolitical distribution of poverty above in pg 41). Unsustainable population growth in these regions in the North is creating dependence issues that are plunging the region into further poverty. The dependency ratio in the northern region rose consistently during the last decade, reaching an average ratio of 114.73% in the Northwest, and 98% in the Northeast. The figure was 91.5% in the north-central, and 75.5% in the Southwest and East. It was 69.3% in the South-South region in 2013 (World Bank 2016,11).

Agriculture, which is by far the largest employer of labour in Nigeria employs close to 70% of the Nigerian labour force with the vast majority in the northern regions of Nigeria. In the Northeast and Northwest regions of Nigeria, almost two-thirds of the population remain in farming (World Bank 2016, 73). Agriculture has also been identified as a key sector that will support economic diversification and growth in Nigeria. The kind of agriculture that is currently being practised is however not fit for purpose (Igbalajobi et al. 2013, 132; World Bank 2014, 1; FMARD 2016, 1).

Farming practices in most of the regions in Nigeria are, however, still rudimentary. For example, the non-complementary relationship between crop and animal production (cattle rearing) in most of the regions in the North of Nigeria is a major problem for agricultural productivity. Although agriculture is also critical to labour and employment in the southern

region, the southern region, and particularly the southwest, has started to diversify its regional economy beyond farming. It is moving beyond subsistence to market-driven approaches. It is combining resources to link both the downstream (production) to value addition and the upstream (processing and value addition) of agriculture to create industries for employment with higher wages across the value chain. This creates an opportunity for skilled workers and higher productivity (Micheels, 2014)

Despite the potential of the agricultural sector, over the decades, non-agricultural income has grown much quicker in Nigeria compared to the agricultural sector, most notably in the southern region. This is particularly the case in the south-south and southwest. For example, non-agricultural income activity in this area accounted for 63% and 68%, respectively of household income in 2013. This increased somewhat in the Northwest to 42% but it was as low as 13% in the Northeast in the same year (World Bank 2016, 86).

All of these multifaceted factors have been attributed to increasing levels of poverty, and mainly rural poverty in these regions of Nigeria.

4.3.3 Rural vs Urban Poverty in Nigeria

Poverty is both a rural and urban phenomenon in Nigeria. It is, however, generally accepted that the rate of urban poverty is lower than that seen in rural areas. Nevertheless, urban poverty has also been on the increase in Nigeria (Ugho and Npekere 2009, 850). For example, in 1980, the prevalence of poverty in the rural areas of Nigeria rose from 28.3% to 51.4 %/. It declined to 46.0% in 1985, and then rose to 65.3% in 2004 (Tomori 2006). A total of 52.2% of Nigerians currently live in urban areas (World Bank 2015).

If the poverty rate is disaggregated over the rural and the urban areas of Nigeria, the share of those in rural areas is constantly higher and continues to grow. In 1980, the rural poverty level was 28.3% of the total population compared to the urban poverty rate of 17.2%. However, this rose to 51.4% in 1985, while urban poverty was 37.8%. A similar trend was observed in 2010 when urban poverty was 61.8%, and rural poverty increased to 73.2% (NBS 2010).

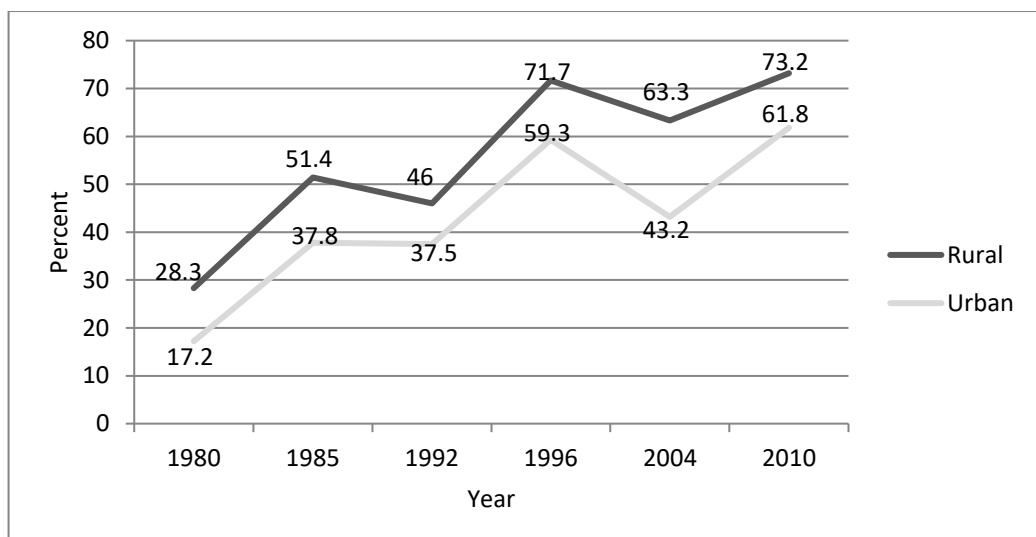


Figure 4.2: Trend in rural versus urban poverty incidence in Nigeria, 1980–2010. (%)

Source: Author's calculations, using the Federal Office of Statistics (FOS) and National Bureau of Statistics (NBS) data.

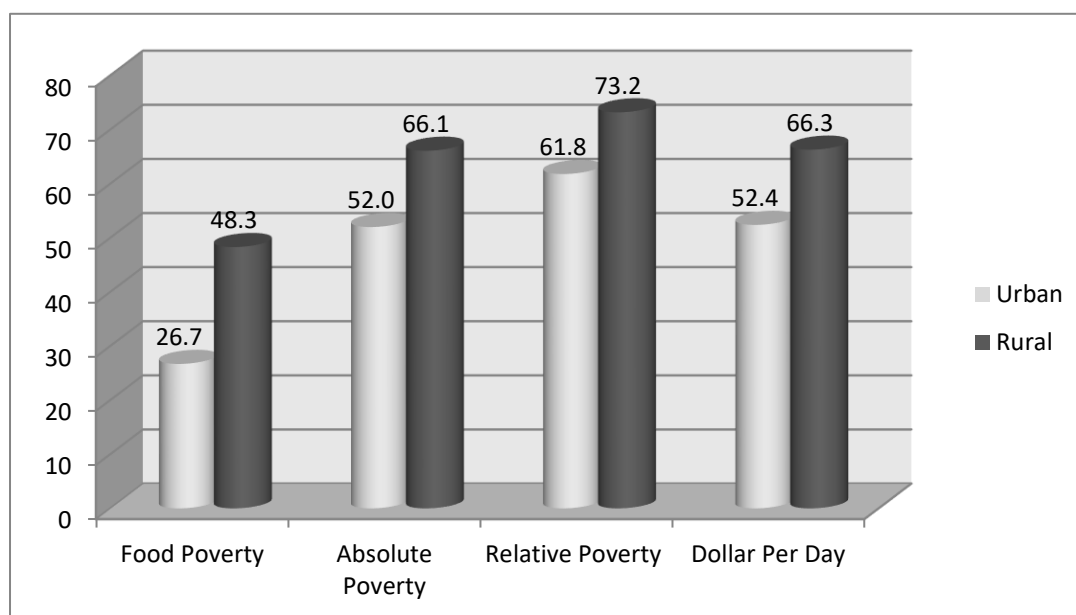


Figure 4.3: 2010 poverty incidences in Nigeria: urban vs rural.

Source: Author's calculations, using the National Bureau of Statistics (NBS) data.

Measuring rural poverty using different poverty measures such as food poverty, absolute poverty, relative poverty, and dollar per day poverty in Nigeria reveals consistent poverty growth across all parameters compared to urban poverty.

These disparities between rural and urban areas can be attributed to several factors, including the urban bias that prioritized urban expenditure and infrastructural development to the

disadvantage of rural areas. As a result, the former (urban expenditure) has attracted both local and foreign investors, has strengthened the diversification of the local economy, and has created several employment opportunities for diverse sectors (Nkwede 2014.153).

4.4 Understanding Rural Poverty in Nigeria

As with the general problem of poverty in Nigeria, the crisis of poverty in the rural areas in Nigeria dates back to the colonial era, when the colonialists exploited resources in rural areas for their own gain. Colonial expeditions changed the entire structure of the rural economy in Nigeria and transformed the nature of landholdings (Abass 2012, 99). Olukunle (2013, 37) while in agreement with Abass notes that support for agriculture in the colonial era was nevertheless high. He stated that because of the colonial focus on agriculture in the 1940s and 1950s, agriculture constituted the main export trade in central Nigeria. It made a great contribution to the country's foreign exchange earnings that were used for capital development projects.

Adejuwon and Tijani (2012) noted that the issue of poverty and how to alleviate it, particularly in the rural areas, has become one of the major daunting tasks for successive governments in Nigeria following independence. In spite of its potential, and rich natural resources, conditions have continued to worsen, and poverty is growing in rural areas in Nigeria (Adeoti 2014, 221). Currently, poverty in the rural areas of Nigeria is still very high, and of the 90 million Nigerians living in rural areas, some 50 million are classified as poor (World Bank 2015; IFAD 2015).

4.4.1 Structural Problem of Rural Poverty in Nigeria

The drivers of rural poverty in Nigeria are complicated, and this is due in part to multifaceted and interwoven causes. Some have identified that this problem could be attributed to inadequate basic services and a lack of assets such as land, tools, and credit support networks (Chukwuemeka 2009, 405). Some scholars note that the inability of smallholder farmers to have access to input and other infrastructural facilities is a major constraint. Further constraints include high marketing costs, labour shortages due to urban-rural migration, infertile soils, ineffective agricultural practices, and a failure to maximize produce. All of this has led to lower productivity rates and lower income (Abass 2012, 99).

Others have noted that land labour, inputs, agricultural advice, and diversification within the agriculture sector are the most important drivers' productivity (World Bank 2014, vi), but these have not been well harnessed by rural dwellers who depend mainly on agriculture.

4.4.2 Irregular Employment and Low Returns on Labour

Past studies (see Bourguignon 2003, Adams 2004) have shown that the extent of poverty partly depends on income levels and the degree of income inequality. Ogbeide and Agu (2015, 443) in their study on the causality effect between inequality and poverty in Nigeria assert that a similar relationship prevails in Nigeria. Low and irregular income, and unequal distribution has exacerbated poverty levels in rural areas in Nigeria.

Olukunle (2013, 40) indicated that labour accounts for 90% of all farm operations in low mechanized agricultural settings in Nigeria. Seasonal labour shortages and the general supply of labour are affected by the constant migration of labour, most notably youth who move from rural to urban areas. The seasonal labour shortage, in turn, adversely affects the cost of hiring labour as well as the cost of production, and profitability for the average smallholder farmer (Olukunle 2013, 40).

4.4.3 Urban Bias in Development Policies

Government's focus on urban areas has become detrimental to rural areas. Inadequate infrastructures such as transportation, electricity, and quality water and information systems in rural areas have exacerbated rural poverty. Government at all levels has continued to pay little or no attention to infrastructure development in the rural areas to enhance the capability of rural dwellers to engage in agricultural activities (Myrdal 1950; Lipton 1977; Ajadi 2012, 352).

The oil boom of the 1970s that brought about positive changes to the economic indicators has created a negative downturn in Nigeria. Jamal and Weeks (1993, 118) noted that, before the discovery and production of petroleum, Nigeria was a state characterized by a relatively narrow rural-urban gap. However, with the emergence of oil as the primary economy, urban-oriented economy at the detriment of the rural development swiftly described the political economy and the public policy focus in Nigeria. This urban bias worsened the terms of domestic trade for poor farmers, food processors, informal traders, and micro-entrepreneurs (World Bank, 1995). The rapid migration of efficient male and female people to the urban areas contributed to declining productivity in agriculture. It accelerated the pace of increased food imports and drove unemployment, widening the gap in social welfare between the rural and urban areas (Ajadi 2010, 351).

Through the economic growth resulting from the oil boom and its spin-offs, the level of income inequalities also rose between urban and the rural dwellers in Nigeria (Anusionwu and Diejomoah, 1981).

4.4.4 Access to Inputs

Many scholars accept that low income and low consumption are critical factors of conceptualizing poverty (Oluwa 2012, 26). Despite this widely accepted notion, the revenue of the majority of the smallholder farmers in the rural areas in Africa and Nigeria remains very low (Etim and Udoh 2013, 142). This low income is partly due to the inability of the smallholder farmers to increase their productivity through the inadequate use of modern agricultural innovation and practices that could stimulate economic growth and raise their income levels.

According to Kormawa (2015, 3), African agriculture remains substantially undercapitalized, with deficient levels of mechanization contributing to agricultural productivity far below the level achieved in other parts of the developing world. He pointed out that over 60 percent of agricultural work is still provided by human power, with only 20% of mechanization and 20% using animals. A World Bank report estimated that the average tractors to arable land in Africa were 13 tractors/100 km², which is far below the global average of 200 tractors/100 km² globally (World Bank 2015).

Kormawa (2015, 2) noted that experience from other developing countries has shown that investment in agricultural mechanization enables farmers to intensify production and improve their quality of life. It also contributes to national and local prosperity.

Liverpool-Tessie et al. (2010), in their general view on agricultural practices in SSA, noted that one of the fundamental problems in agricultural production is the low rate and quality of inputs. A similar experience is documented in Nigeria, where the limited access of smallholder farmers to yield-enhancing inputs and sporadic linkages to downstream markets has limited their productivity and income (Chikaire et al. 2014, 115). Average fertilizer use in Nigeria is 13 kg/ha compared to the world average of 100 kg/hectare. Again, only 5% of farmers could access the improved variety of seeds (FMARD 2011).

Abass (2012, 99) argues that the inability of smallholder farmers to access these inputs and other infrastructural facilities is one of the key reasons for their continued poverty.

4.4.4.1 Access, Distribution, and Efficient Use of Land

Land is a vital, productive asset in rural economies (De Janvry et al. 2001; Ahmed et al. 2007, 15). In most rural areas in SSA and Nigeria, land is not only the primary means for generating livelihood but is often also the main vehicle to invest, accumulate wealth, and diversify the rural economic base (Ajadi 2010, 352). Access to land is still a major challenge for rural poverty. "Land and the institutions that govern its ownership and use significantly affect

economic growth and poverty reduction; it reduces the cost of accessing credit for entrepreneurs” (Chikaire et al. 2014, 118).

Landlessness, and, in particular, rural landlessness is one of the fundamental problems in Nigeria that is increasing levels of rural poverty. Where landlessness is not a major issue, legal title to land may not be available (Chubado 2014, 111); Chikaire et al. 2014, 118).

From pre-colonial times, there was a customary system of land tenure in Nigeria under the Native Lands Acquisition Ordinance of 1900. This ordinance restricted the transfer of rights of the land to aliens. However, by 1917, public land acquisition law empowered the colonial governor to obtain land for public use (Chubado 2014, 113). During this period, two systems of land tenure were in place. The first was a system in the northern part of Nigeria, where the colonial administration put all lands under the control of the Colonial Governor, nationalizing all lands and all titles of occupancy. The use of land required the permission of the Governor. The southern part of Nigeria recognized “that the lineages or extended families owned land, individuals only had the right of use of such family land and were required to seek consent from the government when rights were being conveyed to aliens”. The Governor could, however, acquire land for public purposes referred to as Crown land laws (Mabogunje 2007, 3).

The Land Act 1978 was the first act that attempted to unify the land tenure system all over Nigeria. It created a legal title to land that was known as statutory leasehold in the urban areas, and customary right of occupancy in the rural areas. This statutory title was to be granted by the governor of the state or the local government. It recognized the right of landowners in rural areas to hold customary rights of occupancy (Chubado 2014, 112-114).

The Land Act of 1978 and the subsequent Land Act Cap L5 2004, including a review of the Land Use Act, 1978 were meant to improve land tenure in Nigeria. However, it became an impediment to development instead. As a result of the restrictive nature of rights to land title ownership, especially in rural areas, it has become difficult for landowners to use their primary assets to access the capital that is needed for their economic activities (Chubado 2014, 114; Mabogunje 2007, 1).

This land tenure with user rights, rather than permanent ownership makes the securing of loans or finance problematic. Most financial institutions in Nigeria require titles of land as collateral for eligibility for credit. The land tenure also limits the capacity of smallholder farmers to invest in the development of their farmland with a long-term vision (Anslem and Taofeek 2010, 10).

In addition to the impact of landlessness on poverty in Nigeria, the inefficient use of land is another major problem. Land is not efficiently used by smallholder farmers; hence smallholder farmers fail to maximise their potential for land use that could support high productivity for better income. In a recent world bank report (World Bank 2014, 1), it was opined that growth in the agriculture sector in Nigeria by about 6.8 percent annually from 2005–2009 was not due to increased efficiency in the industry or efficient use of land, but due to population growth and the farming of vast expanses of land by commercial farmers.

The efficient use of land rather than just the cultivation of vast expanses of land is, however, known to have the capacity to help increase farmer productivity that can translate to higher income and reduced poverty (World Bank 2014, 1).

4.4.4.2 Market Access Constraints

Access to markets is crucial for agricultural development and is critical when it comes to linking the farm, rural, and urban economy (Anslem and Taoofeek 2010, 11). It supports productivity, and growth, and reduces postharvest loss.

Inadequate and inefficient rural infrastructures are significant constraints to smallholder farmer agricultural investments, as well as to production, trade, and access to the market (Olukunle 2013, 39). The lack of infrastructure in the rural areas in Nigeria is a reflection of urban biases by the Nigeria government as postulated by Lipton (1977). In some cases, when the infrastructure is available, neglect over the years and a lack of maintenance make the infrastructure inefficient for use.

Such inadequate and inefficient rural infrastructure has added to the postharvest loss of smallholder farmer production. It has reduced their income and plunged them further into poverty. Olukunle (2013, 39) noted that postharvest losses in Nigeria are approximately 40% for perishable commodities, while the rate for cereals, grains, and pulses stands at 15%.

4.4.4.3 Access to Finance

Access to finance is an important determinant to the success of any business and livelihood in the rural and agrarian sector. Improving household access to financial services helps to reduce poverty and improve income inequality (Butler and Cornagia 2008 in Ibrahim 2014, 2).

Without access to credit, smallholder farmers have limited access to quality inputs and the various resources required for agricultural production. Olukunle (2013, 40) noted that the constant increase in the cost of inputs and mechanization has put these resources beyond the reach of many smallholder farmers. They therefore have limited access to the necessary resources to increase their productivity. Also, access to finance provides an opportunity for farmers to aggregate, retain, and store their products until the price of the product becomes

favourable. When finance is not available, farmers tend to sell their products at harvest at suboptimal prices.

As a result of climate change, the agricultural sector has become more prone to risk. Where farmers do not have access to finance, credit, or insurance, they are highly susceptible to several risk factors such as drought and significantly low price differentiation in their farm products. The inability of the rural poor to borrow even a small amount has impacted negatively on them and has reduced their ranks to micro-entrepreneurs (Egwuatu 2008).

Despite the contribution of the agriculture sector to economic growth and national development, the benefits of financial credit in Nigeria are not enjoyed by many (ODI 2013, 28). As of 2011, the agricultural sector accounted for only 2% of Nigerian bank total lending while microcredit stood at just 0.59% (CBN, 2011). Although the agriculture sector in Nigeria contributes 23% to GDP and 70% to the labour force, it only benefits 3.4% of the total financial credit in the country, compared to industry and trade that contributes 19% and 17%, respectively (CBN, 2015). With the problem of collateral, a substantial part of the loan probably went to large farmers (Olomola and Nwafor 2017, 35).

Where access to credit or finance is limited, farmers are locked into the web of subsistence farming, and are unable to participate in production for the market.

4.4.5 Inefficient Government Policies and Programs

Osundina et al. (2014, 1) identified government expenditure as an essential fiscal instrument for growth and development in any nation. Government spending on rural poverty and particularly on agriculture in Nigeria has been inadequate. Between 2001 and 2005, the budgetary allocation to the agricultural sector in Nigeria was slightly less than 1.8% (Mogues et al. 2008). In fact, federal expenditure on agriculture decreases from 106 billion Naira in 2010 to 77 billion in 2016, while total federal expenditure increased from 4.2 trillion in 2010 to 5.2 trillion in 2016. This was a reduction of the total annual expenditure on agriculture from 3% of the total annual budget in 2010 to 1% in 2016. A similar trend was observed at the state level, where agriculture expenditure decreased from 133 billion in 2010 to 92 billion in 2015 (Olomola and Nwafor 2017, 35).

Combined budgetary allocation at state and federal level to the agricultural sector at 2% of the total annual budget in 2016 falls short of the African Union Comprehensive Africa Agricultural Development Program (CAADP) Malabo recommendation. This document set out that all African countries agreed to allocate 10% of their total annual national budget to agriculture (World Bank 2014, 3). Iwala (2014, 14) noted that the uneven distribution of revenue among

the population, and higher government expenditure in urban areas compared to rural areas has further deepened poverty in the rural areas of Nigeria.

4.5 Past Interventions to Mitigate Rural Poverty in Nigeria

Efforts to eradicate poverty predate the independence era in Nigeria (Ugoh and Ukpere 2009, 850). According to Kanayo (2014, 201), “right from 1960 when Nigeria gained independence, the goal of the national program has been the reduction of poverty, bridging inequality gaps, and achieving a sustained growth”. Obikeze et al. (2015, 190) agree, and suggest that since independence in 1960, most governments in Nigeria have been preoccupied with one poverty alleviation strategy or another.

Since poverty is largely a rural phenomenon in Nigeria, most poverty reduction strategies have primarily focused on rural development and poverty alleviation (Ajadi 2010, 351). However, many of these policies and programs have not achieved their objective, and in most cases, they have not translated into a substantial reduction in rural poverty (Ugoh and Ukpere 2009, 847; Tersoo 2013; Nkwede 2014, 2). Ajadi (2010, 351) corroborated this assertion when he noted that the current poor state of rural areas in Nigeria reflects cumulative policy neglect, poor planning, and inadequate resource planning by the Nigerian government to support rural areas.

The experience up until 2000 showed that the program implemented under SAP was ineffective in addressing rural poverty alleviation in Nigeria. The lesson learned from the policy and program implementation under SAP, and the introduction of the United Nations Millennium Development Goals (MDG) from 2000 onward, shifted the paradigm in thinking and practice onwards. The focus of Nigerian poverty alleviation policy and programmes, and mainly rural poverty reduction, turned out to be quite inclusive and bottom-down in addressing poverty eradication and human development. These policies reached beyond the economic growth target that permeated the SAP period.

By 2001, the National Poverty Eradication Program (NAPEP) and the Nigerian Government’s National Economic Empowerment and Development Strategies (NEEDS) were established, (Anyanwu 2012; Tersoo 2013).

Yakubu and Abbas (2012, 97) noted that all these poverty alleviation programs put together since independence were meant to provide a catalytic impetus for take-off and subsequent advancement of the rural areas in order to:

- Link them to national and international economic systems.
- Increase rural household income.
- Provide the necessary socio-economic and physical infrastructure.

- Create efficient resource allocation to shift the attention and interest of the private sector towards investment in rural areas to enhance rural development.
- Enhance rural welfare.

Nigeria built its approach to poverty alleviation post-2015 on the United Nations Sustainable Development Goals (SDGs), which are expected to play a significant role in reducing poverty for MDGs. “The first core goal in the SDGs is to eradicate extreme poverty for all people everywhere with the expectation that by 2030, the extreme poverty will have been eradicated by half” (Liu et al. 2015, 70).

With all the information available from the analysis above, it is evident that Nigeria is not isolated from the issue of poverty in general, and specifically rural poverty. Despite consistent growth in the economic indices in the country and all human and natural resources, most indicators available show that the numbers of rural poor in Nigeria are still significantly high.

Surmounting the challenges of poverty generally and particularly those of rural poverty has been a great concern for the Nigerian government. The government has been engaged in many rural poverty alleviation policies and programs since independence in 1960. Most of the measures that have been adopted have, however, not yielded the expected results. Agriculture that has been identified as the bedrock to rural poverty alleviation has not received the required support, and this has limited the ability of the rural poor, who are usually smallholder farmers, to harness their potential.

4.6 Agricultural Developments in Nigeria

Nigeria freshwater resources cover around 12 million ha, with 960 kilometres of coastline (FGN 2008). As at 2014, about 38.4 percent of the country’s 923,768 sq.km land was arable land. With only 60 percent under cultivation, there is no shortage of land suitable for cultivation overall (FAO 2012; World Bank 2015, 131). Agricultural practices in Nigeria are characterized by small-scale farming, which relies heavily on rural poor smallholder farmers with primitive production systems (Igbalajobi et al. 2013, 132). These agricultural practices remain firmly designed around subsistence, with low productivity levels, and they are climate-sensitive (UNDP 2014 8). The agriculture practices has an inadequate response to innovation and technology; and poor return on investment (Olukunle 2013, 38), I the practices is also mostly not market-driven, because of its poor knowledge of target markets and lack of the business approach that could positively turn around the terrain of agricultural practices in Nigeria (World Bank 2014, 1; FMARD 2016, 1).

Agricultural policy is a statement of action and a fundamental tool employed in achieving agricultural development (FBN 1997). There is, however, a need to avoid a random and

directionless policy, and plans must drive forward meaningful rural development (Chubado 2014, 114). For several decades, the Nigerian government has embarked on several agriculture and rural poverty alleviation or reduction programs involving different interventions, from the colonial times through to the present day.

Ejumudo and Ejuvwekpoko (2013, 70) in their critical appraisal of the strategies and programs in Nigeria since the country's independence, noted that most of implementations have been fraught with deliberately curated poor and cosmetic plans, with a lack of political will and genuine commitment. These interventions are outlined below.

4.6.1 Pre-Independence to Independence (Colonial Era to the 1960s)

Agriculture, which became key to poverty eradication, has been important to Nigeria as a means of national development since the colonial era. Most of the policies during the colonial period were focused on issues that were of paramount importance to colonialists, rather than for the country. These were developed with the encouragement of output growth to satisfy the demand for raw materials in Britain (Ayoola 2001; Iwuchukwu and Igbokwe 2012,11). Primary emphasis was placed on a policy that strengthened forest matters, that was of paramount importance to the needs of Colonialists. Less emphasis was placed on food and animal production that was so crucial to the local community. Iwuchukwu and Igbokwe (2012,11) noted that the impact of the policy was reflected in the fact that, during this period, until the end of the colonial era in the early 1960s, there is only one documented agricultural scheme termed the "Farm Settlement Scheme" that evolved in Nigeria.

Historically, the Sahelian droughts of the 1970s, however, have been identified as the key issue that was brought to the attention of the Nigeria government. The government recognised the need for a special focus on rural development (Mortimore 1989). From this period onward, many policies have been put in place to address national poverty through diverse agricultural and rural development programs.

4.6.2 Independence to the 1980s

From Independence, the focus of Nigerian government policies shifted from the resource extraction policy of the colonial era, to export-led growth from the 1960s to 1970s, and import-substitution policy during industrialization from the 1970s through to the 1980s. The policy was put in place to replace the importation of domestic goods and increase local citizen participation through employment in diverse areas across the value-chains in the production of goods and services for domestic needs. This change in policy came about with the expectation that the rural community would play a key role, and the rural community would be of immense benefit to poverty alleviation.

The approaches before the 1980s were conducted through several interventions for rural poverty alleviation in Nigeria. Some of these interventions include the National Accelerated Food Production Program (NAFPP) in 1972, and Operation Feed the Nation (OPFN) in 1976. The latter intervention was launched to bring about food sufficiency in the country through the involvement of all citizens. The provision of input by the government was useful to make use of all available lands in the rural and urban areas for agricultural purposes. Other interventions include the River Basin Development Authorities (RBDAs) established in 1976 to boost economic growth through the development of irrigation and rural infrastructures. Another one was the Green Revolution Program (GRP) created in 1979 to support an increase in production of raw materials for food self-sufficiency and export (Ayoola 2001; Iwuchukwu and Igbokwe 2012,13).

Olukunle (2013, 40) noted that, as laudable as the policy and these programs were, because of their impact on the seasonal increases in agricultural outputs during this period, the value-chain in agriculture was treated in isolation from other systems, and little attention was paid to the comprehensive and holistic management of rural agriculture along its value-chains. He noted further that this resulted in inefficient and ineffective postharvest management, and low levels of industrial utilization. This approach created more problems without achieving the anticipated overall goal of rural poverty reduction (Olukunle 2013, 40).

4.6.3 Policies between 1980 and 2000

Nigeria was not immune to the spread of SAP, and one of the policies recommended to the Nigerian government was to reduce oil dependency. Recommendations through the SAP became a precursor to rural poverty interventions during this period, with key SAP policies on privatisation, fiscal austerity, free trade, and deregulation. As part of this process, the government developed several rural development programs aligned with SAP. These were designed to promote the growth of resource-based industrialization, in place of the import substitution strategy, which had become unsustainable because of the paucity of foreign exchange that affected the country's ability to support industrialisation (Akpobasah 2004, 2).

Some of the programs embarked on during these periods included the establishment of the Directorate of Foods, Roads and Rural Infrastructure (DFRFI) in 1986. Its remit was to overlook deficit in the rural areas and to give direction to rural development. By 1990, the People's Bank of Nigeria was established to provide loans for prospective entrepreneurs in both the rural and urban areas. The government created the program to reduce the problem of access to finance by the rural and urban poor that would not ordinarily have access to finance for their enterprises (Oladeji and Abiola 1998).

The government also established the Better Life Program (BLP) for rural women in 1993. The program was specifically designed to focus on poverty alleviation amongst rural women (Lucas 2000, 87) as part of the SAP policy of the government. Lucas (2000, 92) noted that BLP did not achieve its set objectives in alleviating rural poverty in any form. Many women under the program did not feel that there was any improvement in their lives. In Lucas words, “the failure of BLP was an indication of failure through the government structure that was primarily driven by SAP during this period”.

Ucha (2010, 53) noted that poverty and social indicators worsened as more revenue generated during that time was used to service Nigeria’s external debts as recommended under SAP. Oluwa (2012, 29) attributed the severity of poverty in Nigeria between 1985 and 1992 to the implementation of SAP during this period. The agricultural sector was one of the areas that was severely affected by the introduction of SAP. Agriculture export shares of Nigeria’s total exports declined to 5% during the SAP implementation years (Olukunle 2013, 40,).

4.6.4 Policies Post the 2000s

From 2011 to 2015, the Agricultural Transformation Agenda (ATA) was formulated in Nigeria to address neglect in the rural areas. The plan was to focus on the reduction of food importation in Nigeria through the development of a market-oriented and private sector-driven agricultural policy and program in Nigeria. This was designed to create self-sustenance in food production and consumption, and to drive exports of processed crops. As part of the program, it was also expected that “the smallholder subsistence farmers would be moved from their high poverty level into a commercial system that will facilitate trade and competitiveness” (Chikaire et al. 2014, 117).

The key strategy of ATA was to increase the access of smallholder farmers to subsidized inputs (seeds and fertilizer), finance, and the market for the smallholder farmers through the establishment of the Growth Enhancement Scheme. This scheme introduced a register of smallholder farmers in Nigeria, possibly for the first time. It also addressed the need to restructure the federal fertilizer procurement system using electronic systems to target smallholder farmers. It re-established a number of select commodity marketing companies (FMARD 2016, 4)

The government recorded some success through aspects of this program (mainly the ATA) such as increased access to subsidized inputs, particularly fertilizer and access to markets for the smallholder farmers (FMARD 2016, 6). There are, however, several shortcomings to ATA that limited one of the expected significant outcomes of the program, i.e., input support for smallholder farmers to increase yield and productivity to enhance their income for poverty

reduction. There were abuses of the system in the area of seed distribution, for example, and many vendors supplied grains rather than quality seed to smallholder farmers. As such, smallholder farmers were not able to access the majority of the funds that could support a move from subsistence farming to agribusiness (FMARD 2016, 6).

Since 2015, the Nigeria government has developed a national policy of economic diversification in which agriculture takes centre stage. Recently, the roadmap for agriculture and diversification of the Nigerian economy in Nigeria tagged “The Green Alternative” was launched by the Nigerian government. The government built the roadmap on the first ATA agricultural policy of the Federal Government of Nigeria. The approach by this current government of building on a predecessor agricultural policy is a divorce from traditional policy formulation in Nigeria.

The policy objective of the green alternative document has a four-year implementation period (2016–2020) that is intended to make agriculture the biggest alternative to the oil and gas sector. The aim is to diversify the Nigerian economy (FMARD 2016). The main priority of the policy is to reintroduce the Nigeria economy to sustainable business-driven agriculture, with the private sector taking centre stage in using agribusiness to support the alleviation of poverty, particularly in rural areas.

4.7 Experience of State-led and Market-led Agricultural Developments in Nigeria

Nigeria has also experimented with both the state-led and market-led agricultural development as part of its agricultural policies and programme approaches. Both approaches had their impacts and challenges for agricultural practices and development in Nigeria.

4.7.1 State-led Agricultural Approach in Nigeria

There are three major state-led agricultural approaches that the Nigerian government has experimented with over recent years: marketing boards from the colonial era, agricultural cooperatives, and state-owned enterprises.

One of the state-led approaches that was embarked on early, during the Nigerian colonial era was the marketing board. The British government established marketing boards in Nigeria around the 1940s to focus on different cash crop commodities within the country for major agricultural exports. The cocoa marketing board was established in 1947; while those for groundnuts, cotton, and palm produce were established in 1949.

These marketing boards were established with the primary aim of supporting the seasonal price fluctuations of export produce, revenue generation for the regional governments, economic development of the production areas, and scientific research in agriculture (Iweze 2014, 1). Beyond the primary focus on revenue generation, it also served to protect the United

Kingdom from the scarcity of the raw materials. In theory, the marketing board played three crucial roles during the period it was implemented in Nigeria. These were:

- 1 As a change agent in the agricultural terrain, where it established marketing practices and procedures for raw and or processed products.
- 2 Regulatory roles over agreed marketing practices and procedure, e.g., credit agreements, quality control, etc.
- 3 Providing all or some of the facilitating services, e.g., credit, market intelligence, and risk management (FAO 2010; 7).

As a result of the work of the marketing boards, as early as 1961, Nigeria ranked as the leading exporter of groundnuts in the world, and was a major exporter of palm oil, cocoa, and cotton. It contributed 42%, 27%, 18% and 1.4%, respectively, to the world export of these products during that period (FMARD, 2011). In comparison with the other two major sources of government revenue during the period (primarily from the import and export duties in Nigeria), revenue from agricultural products under the marketing boards was far higher.

Between 1947 and 1954, the four marketing boards in Nigeria mobilized nearly 120 million pounds sterling, over 100 million (net) of which had been realized as trading profits in the four commodities. The import duties accounted for only 93.5 million pounds sterling, and export duties totalled only 56.7 million pounds sterling in revenue (Helleiner 1964, 584) in the same period.

The accumulated funds during this period until the mid-1950s were used for agricultural development projects, the small-scale processing of agricultural products both for local consumption and exports, and the construction of roads for market access. The funds were also used in research and the development of key crops for improved production, and better distribution of improved varieties of seeds, stores, and cooperative marketing schemes (Helleiner 1964, 594).

There was, however, a shift in the approach from commodity-specific to regional-specific operations from 1954 onwards (Helleiner 1964, 595). The marketing boards were separated based on the different regions where the crops were produced in Nigeria. This separation was influenced by the Nigerian constitutional review of 1954, and the 1957 Constitution that followed, where the British government gradually devolved sovereignty in Nigeria to regional governments. Extra power was vested in regional government and, as a result of these changes, each regional marketing board took over the responsibilities of handling the export of all products within its region.

The regionalization of the marketing boards brought about a decline in barter regarding trade and a reduction in exporting costs. Between 1954 and 1961, the total accumulated revenue of the marketing board was less than one-quarter the size of the aggregated trading profits of the previous seven years (Helleiner 1964, 585).

This decline came about because the primary objective of the marketing board shifted under regionalization. There was a shift in emphasis from ensuring the stability of price and the subsidizing of agriculture to support for infrastructural building in some regions in preparation for industrialization (Nkanga 2014). Infrastructural development during this period was urban-biased. This became worse as the nation eventually focused on, and channelled all its energy into oil exploration, to the neglect of the agricultural sector.

The first known modern agricultural cooperative society in Nigeria was established in 1935, when the Nigerian ordinance of cooperative societies came into operation (Nnadozie et al. 2015, 3). Nigerian membership of cooperatives has increased and expanded across the states and local governments of the Federation built up a strong capital base.

A possible motivation for the creation of agricultural cooperatives is related to the ability of farmers to pool production and or resources to achieve common production goals (Toluwase and Apata 2012, 66). Odigbo (2011, 215) identified four main characteristics of agricultural cooperatives, that distinguish them from other types of economic enterprises as follows:

- i. Collective and democratic management of the organization—voting rights in the members' general assembly was allocated by 'one man one vote'.
- ii. Double conditions of members as owners and patrons of the cooperative.
- iii. Provision of agricultural activities and directly connected services to benefit members mainly.
- iv. Distribution of dividends among members allocated according to each member's use of the cooperative's services.

Agricultural cooperatives form an integral part of agricultural development in rural areas. According to Ayoola (2006, 2), three main factors determine the success of agricultural cooperatives: their position in the food supply chain, their internal governance, and the institutional environment. The position of agricultural cooperatives in the food supply chain, therefore, refers to the competitiveness of cooperatives vis-à-vis its partners, such as processors, wholesalers, and retailers. It also refers to the strategy that the cooperative follows in choosing a particular position in the food chain (Okeke 2010, 32).

The majority of the agricultural cooperatives in Nigeria have multipurpose functions, from financing and credits to input suppliers, marketing, and purchasing (Abdulquadri and

Mohammed 2012, 538). They alleviate some of the constraints experienced by smallholder farmers such as collateral, high-interest rates, and excessive bureaucracy. Cooperatives are associations of large numbers of small farmers. They act as a large business entity in the market, reaping the significant advantages of economies of scale that are not available to members individually. Cooperatives have also increased the bargaining power of farmers since they all “speak with one voice” (Okeke 2010, 40). Due to economies of scale (or other factors that limit competition), a cooperative has market power, which can be an incentive for farmers to become part of the organization, and thereby avoid price exploitation.

Nigeria saw the emergence of state-owned enterprises as early as 1950, when the nationalist government established the Nigerian Colliery Department as a public corporation (Omoleke 2010, 110). SOEs, however, grew stronger in Nigeria in early 1970 after independence, when the country was seeking national economic growth through self-reliance. During the time, SOEs were used as one of the main intervention tools by the government for national development (Imhonopi and Urim 2010, 238). They operated under the conditions of capital scarcity and structural defects, they comprised of private businesses (Omoleke 2010, 113 Citing Nigerian Development Plan 2, 75).

Although the SOE was established as a quasi-commercial organization and were expected to run as free enterprises, they were also expected to become the engine of growth for the expanding needs of the country. Yet, they were marred with a lot of inefficiencies. As non-profitable ventures, they became dependent on government funds, and did not deliver the developmental outcomes expected of them (Obadan 2000). This has been attributed to the fact that most SOEs became a tool for political patronage, with incompetent people imposed at the helms of the affairs of these operations (Imhonopi and Urim 2010, 239).

4.7.2 Experience of Market-led Approach in Nigeria

Nigeria is has an economy that is increasingly market-oriented and private sector-led (Olomola 2010,3). The quartet of the global driving factors (population growth, urbanization, growth of the middle class, and globalization) highlighted earlier is also a key reason why the Nigerian government is renewing its interest in a market-led approach to agriculture.

The Nigeria population has already surged from 95m in 1990 to 201m in 2019. Nigeria’s population projected double to more than 400m by 2050, when it may become world’s third most inhabited country. This is a large share (20%) of the overall projected population increase in SSA. Similar growth is being experienced in urbanization, along with the growing middle classes. The fast-growing population and urbanization have created a food deficit of 56 million tonnes. This has presented a market-led approach opportunity for Nigeria (Nigeria Zero Hunger 2016, 4).

These four factors, in addition to the specific domestic economic issues through dwindling national revenue, are driving the attention of Nigeria policymakers towards diversifying the economy and letting agriculture take centre stage again.

Recently, the federal government, of Nigeria revisited the need to diversify the economy from a mono-economy that depends mainly on oil to a more broad-based economy that sees agriculture as one of the crucial drivers of the economy. This need for diversification has reawakened the debates, policies, and programs on agriculture, rural development, and rural poverty alleviation in Nigeria (FMARD 2016).

This is part of a wider paradigm shifts in policy and programs to ensure that the focus of the nation's agricultural practices progress from subsistence practices to more market-driven agriculture that can improve productivity and income for smallholder farmers.

Unlike the past, where growth in agriculture in Nigeria was focused on the production and exporting of unprocessed crops, the focus has shifted to the inclusion of value-addition and processing. It also requires a focus on both the sustainable uses of land, and the use of modern technology to increase productivity (FAO 2016,76) for both food and cash crops.

These new approaches have also shifted the focus of the country to advanced production that recognizes agribusiness and private-sector involvement at both downstream and upstream as the key to being able to produce and process food locally. Such foods would otherwise be imported and the government would otherwise focus on providing an enabling environment for the private sector to thrive and support major infrastructural deficits (Federal Government of Nigeria, 2017).

The investment environment in the agricultural sector is rapidly evolving, with opportunities for private sector engagement across all value-chains in Nigeria (Michael 2017). Private sector engagement is not a new phenomenon in the Nigeria agricultural sector. Its involvement in the agricultural sector, however, has been narrowed to participation at the upstream through the supply of inputs, in the processing and export stages, with less focus on support for crop production at the downstream, and for production for domestic consumption. The low level of involvement of the private sector in the downstream, among many other factors, can be attributed to the perceived high risk and volatility at the crop production level, and especially because of the nature of smallholding and the crop production line.

The recent diversification of the Nigerian economy from a mono-economy dominated by the oil industry to an agriculture-led economy has, however, necessitated the intervention of the private sector at both the downstream and upstream sectors. A recent report on zero hunger in Nigeria highlighted the importance of private sector involvement in both sectors across the

value chain in Nigeria when it pointed out that “private sector involvement in the downstream is now a must, it is required for the nation as it's moving towards an agriculture market-driven economy that will have agribusiness at its core. It noted that to produce low-cost, fortified, blended food using locally grown, the private sector now needs to engage from the downstream up to the upstream” (Nigeria Zero Hunger Report 2016, 3).

Unlike what has been recorded in most countries where the primary drivers of the out-grower scheme are foreign and not indigenous multinationals, and are primarily focused on production for export, there is a growing development amongst larger, indigenous companies. These companies are focused on food processing and packaging and they engage in contract farming. The value added here is to strive towards production for the growing domestic and urbanized middle-class population. In addition, the regional market seems to be opening up through diverse inter-regional, bilateral agreements, and that traditional international market (FAO 2016, 72). Although these companies generally view the issue of crop production as a very intensive and high-risk prone venture with low profit, they nevertheless produce these crops because of the need to constantly use crops as key raw materials for continued processing.

One of these large companies are the Dangote Rice Out-grower Scheme in Sokoto State that planned to produce 225,000 MT of parboiled rice through the scheme by the end of 2017. (African Farming 2017). Another is Natnudo Foods which works in conjunction with Amo Farms Sieberer Hatchery Broiler's out-grower scheme. It currently supports about 5,000 farmers under its scheme (Olalekan 2017). The Olam Out-grower Scheme in Rukubi rice farming communities in Nasarawa State is another example. It works with about 650 farmers under the scheme. (Onyekwena 2016). Niji group out-grower scheme works with out-growers on 10,000 ha who pay for its farm services including farm practices, processing, and marketing networks in the production of vegetables, cassava, and some of its derivatives. (UNDP 2013).

The unequal power relationship between large and multinational companies and farmers is acritical issue that has been identified as a challenge for contract-farming globally. This also troubles contract farmers in Nigeria.

In conclusion, there are diverse agricultural practices that have been adopted globally in the past; and these are either state- or market-driven. These approaches have been influenced at different times based on global economic direction and policies, and sometimes specific macroeconomic, national issues.

The Nigerian government, at different times has also adopted similar approaches to enhance the general development of the country, such as through marketing boards, agricultural

cooperatives and state-owned enterprises existing under state-led approaches. Of late, the Nigerian government has embraced agribusiness as part of the re-emergence of the market-driven approach to agriculture. This became necessary because of the key challenges facing Nigeria, ranging from an increase in population growth, increased urbanization, the growth of the middle class, globalization, and dwindling revenue from the oil sector.

Agribusiness requires strong involvement from the private sector. Agribusiness and private sector involvement in agriculture are not new. There is, however, a divergence in the new approach, whereby the interventions of the private sector occur at both the downstream (supply) and the upstream (demand). They are also involved in the production and processing of commodities, not just for the international market, but also for regional and domestic markets to cater to growing demands within SSA.

This chapter examine poverty in the context of Nigeria and the implication of the constraints on the dominant subsistence practices of agriculture in the country, in doing so it explains the different parameters that could be used in measuring poverty in Nigeria and concluded on the appropriate method that will be adopted to measure poverty in this research as the national poverty income line due to its relevancy to the research context and demography. It further reviewed approaches that has been adopted on the state-led and market-led agricultural developments in Nigeria.

Chapter 5: The Agresults Model: Operation and Implementation Methods in Nigeria

This chapter examines the AgResults initiative as an agribusiness model. It provides a critical analysis of the approach adopted under the pilot initiative in Nigeria. It also identifies the challenges encountered, the outcome of the project after five years of implementation, and how it contributes to reducing the structural constraints on agriculture that impact on rural poverty through a private sector, led market-driven approach.

A lack of private-sector involvement in the agricultural sector for a long time has impinged on the structural support that could enhance the growth that was expected to occur through high productivity and income in the agricultural industry (Philip et al. 2009). Lucci (2012, 7) opined that the involvement of the private sector in agricultural development could be classified into two categories; “those that mainly leverage business supply chains and the production process, and those that harness business innovation capacity (to target the needs of low-income consumers, tackle complex development challenges or fill funding gaps)”.

The engagement of the private sector in the agricultural industry became significant in the 1990s through Corporate Social Responsibility (CSR) initiatives that saw pressure by the civil societies and media that put corporate practices under scrutiny. Some corporate organizations started to view CSR as an opportunity to get a “license to operate” in a foreign setting (Callan 2012). The efficiency of the CSR on agriculture development has, however, been questioned, because of the difficulties faced in monitoring related activities (UNDP 2004; CAFOD 2009). In the past, most engagement with private companies in the agricultural sector was primarily driven by multinational companies that sourced primary commodities directly from developing countries for their parent companies overseas, or through their subsidiaries in developing countries (FAO 2003).

The clamour for the involvement of the private sector in agricultural development which is expected to engage core business activities beyond philanthropy and focus on the downstream is becoming very robust. Strong arguments have been raised in support of private sector interventions that can also channel market forces to poor smallholder farmers working in the upstream segment of the agricultural sector (Ashley 2009). The paradigm shift in private sector involvement is growing because of diverse factors. Key amongst these is an emerging understanding that the participation of the private sector in development is becoming critical to reaching the bottom of the social pyramid with new, innovative strategies and markets (Porter and Kramer 2006; Philip et al 2009, Bateng 2011). In addition, there is a growing need for greater collaboration beyond the traditional partners of international, bilateral, multilateral donors and government to fund complex developmental issues in the face of fiscal constraints in developed countries (Lucci 2012,1).

Different schemes and initiatives are emerging, showing early signs of the possible integration of the private sector in the agricultural development domain. Contract farming as part of the out-grower scheme, is showing early signs of possible partnerships between the private sector and smallholder farmers in agricultural settings (Huh et al. 2012, 188). The out-grower scheme is creating a platform for private sector engagement at both the upstream and downstream of the agricultural sector. The scheme is primarily focused on building a partnership between smallholder farmers and the private sector to create produce for specific companies geared towards production for export purposes, with some funding and input support for smallholder producers.

The scheme was initially, and primarily built with international company participation. The recent trend, however, is being driven by both international, and some domestic private companies (Abramovich and Krause, 2014; FAO 2016,72). Although the out-grower scheme is breaking new ground in private sector engagement in the agricultural sector, concerns with its ability to enhance market development has however been raised. There are questions as to the viability and equitability of the partnerships that exist between smallholder farmers and private companies, and their combined impact on poverty reduction (Wang et al. 2014; Bellemare and Novak 2017). Others have raised concerns as to the inability of the scheme to support the critical structural constraints of the agricultural sector (Oya 2012; Wang et al. 2014).

Other recent schemes, such as the AgResults Global Initiative are emerging in developing countries. With a focus on support at both the upstream and downstream levels, these are expected to address many of the structural agricultural problems and bridge the uneven relationships that exist between private companies and smallholder farmers under the out-growers' schemes. The scheme was developed to drive private sector involvement in the agricultural sector in areas where gaps are evident. The aim of the scheme is to support innovation to address the needs of poor smallholder farmers, whilst creating potential gains for businesses. Unlike many previous initiatives that required push mechanisms, a donor-funded approach and pre-defined goals and strategies (Lucci 2012, 8), the AgResults initiative is driven by a pull mechanism. The focus is on a results-based incentive approach with a pre-defined goal, but not a pre-defined strategy (AgResults Initiative 2018).

AgResults was established in 2012 by the G20 countries and was first piloted in Nigeria in 2013 with initial support from four nations (the United States of America, United Kingdom, Canada, Australia). It also received support from the Bill and Melinda Gates Foundation. The scheme is now being implemented across six countries in Africa and Asia (AgResults Initiative, 2018).

The initiative is guided globally by a governing structure, which includes a steering committee composed of donors, a trustee that leads on fiduciary responsibilities, a secretariat that provides guidance on overall implementation, and an external evaluation team that engages in impact assessments of the project. It also has an in-country structure that includes the Advisory Council Board, the Project Management Unit, external verifiers, implementers (domestic private companies), and smallholder farmers.

AgResults data collected by both the project implementation unit and the external evaluators reveals much about the success of the model over the years. The results show signs that the private sector can engage at both the downstream and upstream levels of the agricultural value chain, and can significantly contribute to overcoming some of the structural constraints to the agricultural sector. Nevertheless, it also encounters diverse challenges in its implementation.

5.1 The AgResults Global Initiative

Traditionally, agricultural and rural development interventions in developing countries have been driven primarily through a push mechanism approach that focuses on the provision of a grant to a specific or group of organizations or government. This push mechanism has a pre-defined goal and strategy for development (Lucci 2012). However, recently, the international development community has been exploring different options, most notably because of the dwindling development fund from donor countries as a result of the global economic downturn (Lucci 2012; The Punch Newspaper 2018). Progress has been stalled also because of concerns about the lack of continuity and the sustainability of the majority of the development projects implemented in developing countries. These are primarily driven by non-government organizations which are limited to the project timeframe.

One of the new options being adopted is the global AgResults Initiative. AgResults is working towards a paradigm shift towards a pull mechanism approach to agricultural development that reaches beyond the conventional and unsustainable donor-driven push mechanism approach. The central idea of the 'pull mechanism' is to incentivize the involvement of the private sector in agriculture along the agricultural value chain, and to achieve predefined goals rather than predefined strategies (AgResults Initiative, 2018). The pull mechanism, in its broadest sense, is not a new approach; it has been in existence for centuries as a means of financial incentives (William and Benoit 2008). The tone for the implementation of the pull mechanism in agricultural development was only recently agreed at the Toronto Declaration of the G20 countries meeting in June 2010. During this meeting, members of the G20, along with other participants in the meeting called for the development of "innovative", results-based mechanisms to harness the creativity and resources of the private sector in achieving

breakthrough innovations and investment in food security and agriculture development in poor countries” (G20 2010). The concept of pull mechanisms for agriculture, however, received its first explicit reference in the November 2011 Report of the G20 Development Working Group (G20 Report 2011). It came into the limelight recently through pilot pull mechanisms, such as health and agriculture programs (IFAD 2014). It was formally launched in June 2012, at the G20 Summit in Los Cabos, Mexico. AgResults is an international multilateral-initiative established jointly by the governments of Australia, Canada, the United Kingdom, and the United States, and the Bill and Melinda Gates Foundation in 2012.

Through the AgResults pull mechanism, ex-post economic incentives are established for businesses or organizations in areas where private sector investment is virtually absent due to market uncertainties (AgResults 2015). In doing so, AgResults is considered to go beyond the traditional aid push mechanism that uses the grant model to determine a specific path towards development goals.

Scherer and Yago (2011) noted that one of the critical factors that distinguishes the pull mechanism from the more traditional push mechanism is that it does not require the donor to pick a winning strategy in advance. This in turn reduces the usual level of subjectivity associated with development practices. AgResults-financed pull mechanisms do not incentivize input and processes, but define development problems and they find only those development outcomes that can be achieved (AgResults Initiative 2018). In contrast to traditional international development grant financing models, a pull mechanism rewards the achievement of pre-defined development results without specifying the strategies and technologies to be used to achieve those results. In this way, pull mechanisms can directly incentivize the private sector to develop new, profitable enterprises better serving the needs of the poor. There is a lack of clarity as to the extent to which a pull mechanism can be adopted independently of some elements of the push mechanism. Scientific studies around the impact of the pull mechanism are still very limited and embryonic.

The overall goal of AgResults is to enhance food security and safety, increase smallholder incomes, and promote better health and nutrition in developing countries by stimulating private-sector agricultural innovation to bridge barriers that have been identified as critical structural problems (World Bank 2012).

5.1.1 The AgResults Global Initiative Governance Structure

The global AgResults initiative governance model and operational structure comprises four critical entities as follows:

1. The Steering Committee (SC) that includes a representative of the donor countries which currently comprises five contributing donors. They are the permanent decision-making body of the global initiative, and they serve as the sole decision-making body for the overall AgResults Initiative.
2. The World Bank is the Trustee and Administrator of the AgResults fund. The World Bank is a permanent, non-decision-making trustee of the AgResults Initiative. As part of its role, it negotiates and amends contributions to overall agreements with contributing donors and receives and invests funds from committing donors. It disburses funds to the Secretariat (for its costs), the pilot managers, the verifiers, and the implementers at the request of the Secretariat. It does so after obtaining the approval of the Steering Committee. It also provides regular financial reports to all concerned.
3. The Secretariat is Deloitte LLP. This unit drives the pool project design globally and acts as the program manager overseeing the global AgResults project. They provide project management and implementation guidance to all project managers, ensuring that the projects meet the overall objective of AgResults
4. The External Impact Evaluator: the ABT Associate, is responsible for the overall independent monitoring and evaluation of the project. It is also saddled with the responsibility of conducting impact evaluations of pilot projects that will test the effectiveness and efficiency of pull mechanisms in the agricultural sector (AgResults 2016, 3).

5.2 The AgResults Initiative's Nigeria Pilot Project

The AgResults Initiative Nigeria pilot project commenced in 2013 under the stewardship of the World Bank. In April 2013, Deloitte Consulting USA took over from the World Bank as the pilot secretariat.

The primary aim of the AgResults initiative is to evaluate;

- The impact of the AgResults initiative on private sector involvement in the development of the agricultural sector
- The impact of the AgResults initiative on the uptake of Aflasafe innovation amongst smallholders
- The impact of the AgResults initiative on smallholder incomes
- The impact of the AgResults initiative on demand for derivative food products amongst poor consumers

These four primary aims highlighted above are implicitly linked to the overall research of this study (see chapter two for more details). The first, second and the third aim above are, however closely associated with two areas of the overall research focus, which are to understand the extent to which AgResults implementers, generally known as agricultural enterprises, contribute to an increase in the agricultural income of smallholder farmers through support for agricultural production. The second area relates to the mechanisms that could enhance and sustain the contribution of the AgResults implementers to support a long-term change in the incomes of smallholder farmers to address poverty.

The project started with four private-sector agribusiness enterprises, also referred to as “implementers”, and, in its fifth year, it worked with 20 implementers that partnered with around 26,000 smallholder farmers. It is expected to work with 30 implementers that are anticipated to engage with 35,000 smallholder maize farmers in the final year of the initiative. The project ended in 2019.

Prior to the inception of the project, there were a few instances when the private sector worked with smallholder farmers in Nigeria (ABT Associates 2014). To date, some 46 agribusiness enterprises have been recruited to be part of the AgResults implementation. Within this period, some 13 of those recruited dropped out before annual implementation was fulfilled. Six of the recruited businesses dropped out after one or two years of implementation. Three re-joined the project in subsequent years and are still implementing to date. Nine dropped out within five years of implementation. The dropout rate of the majority of the recruited businesses was attributed to the inability of the implementer to access funds for operational purposes at the beginning of the implementation period. In the end, a few of the organizations that were involved in the donor-funded push mechanism project were not able to continue as part of the private sector. Others, especially in the North Central of Nigeria, dropped out due to incessant attacks on their farms by herdsmen.

The AgResults model in Nigeria focuses on creating sustainable market demand for quality agricultural produce. It develops and implements interventions that address structural problems in relation to rural farming through private sector involvement that boosts socio-economic benefits at every stage, from when the crop is planted, through to harvest time, and all the way through to the market.

The implementation started in the first year three states in one region: the Northwest. It later spread to 13 states in four (North Central, Northwest, Southwest, and Southeast) of the six regions in Nigeria in its fifth year. The project was not able to extend to the North-East and South-South regions due to community clashes and instability.

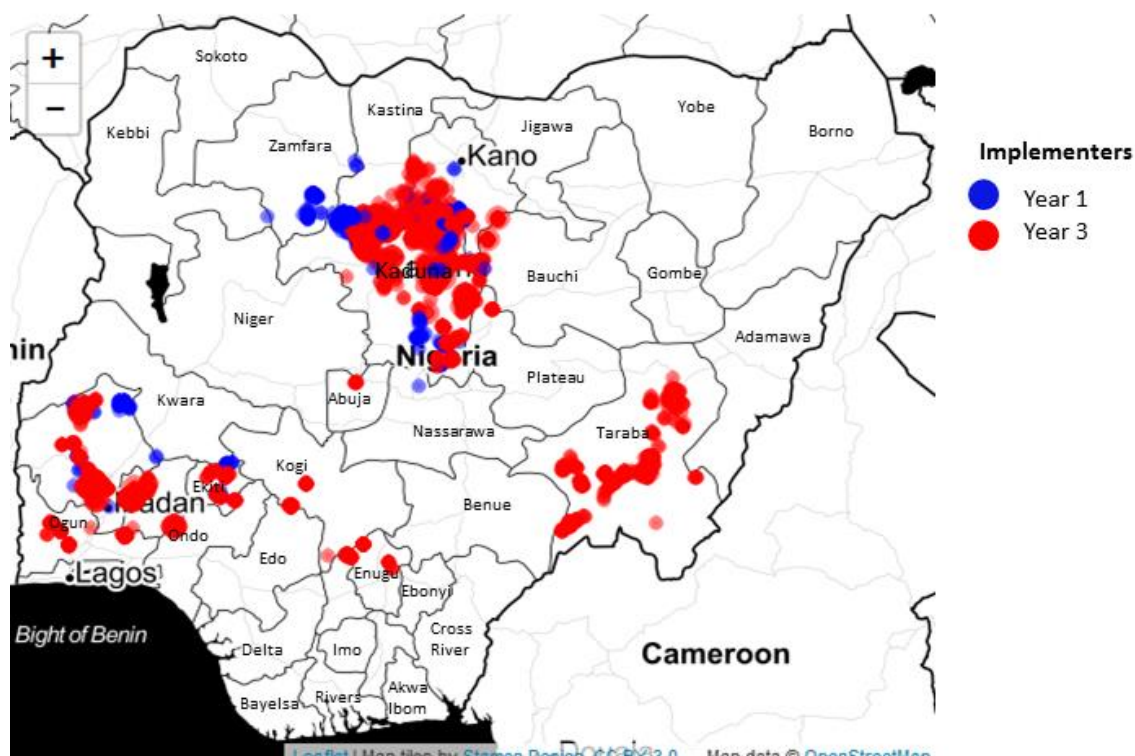


Figure 5.1: Map showing spread of implementer in Nigeria between 2013 and 2016

Source: AgResults Pilot Initiative Annual Report 2017

5.2.1 The AgResults Nigeria Pilot Conceptual framework

The overall AgResults pilot concept in Nigeria seems to have a close similarity to some other emerging business models, such as creating Shared Valued (SV) and the Inclusive Business Models (IBMs). Both models add to the broader discourse on business models with the understanding that the private sector is key to the development of profitable business models while enhancing developmental impact (William and Hayes 2013,10).

The origin of the concept of Creating SV can be found in Porter and Kramer (2006, 5). They observed that company efforts to improve their social and environmental impacts have not been as productive as they could have been. They stated that the mutual dependence of companies and society implies that both business decisions and social policies must follow the principles of SV, with the understanding that economic benefits and social goals could be integrally connected (Porter and Kramer 2006, 5).

The SV framework has, however, not progressed considerably. The tools and strategy for integrating and measuring it have only recently been developed (Bockstette and Stamp 2011). However, Porter and Kramer (2011) provided a slight development to the concept by

broadening it out to have a greater focus on the nature of capitalism and markets, they argued that “firm-level social constraints do not necessarily raise internal costs for the firm. Instead, through innovation in new technologies, operating methods, and management approaches, a firm can improve society while increasing their productivity and profitability”.

Other models, such as IBM have sought to directly involve the poor in their value chains as a complementary strategy to enhance the overall environment for such models to flourish (William and Hayes 2013, 10). It is a commercially viable model that benefits the poor by including them in both the demand and supply sides of the value chain. The IBM concept was first formalized in a UNDP (2008) report, where it was noted that IBM builds bridges between business and the poor for mutual benefit. It creates value by providing products and services to (or sourcing from) the poor, including the earned income strategies of nongovernmental organizations. The IBM approach is not a philanthropic gesture and it is limited in scope and budget. However, it is a business model that is entrenched in the core business activities of a private company within a society or community. There is, however, no single framework for both SV and IBM (Ashley 2009a; Davis 2012).

Although IBM is complementary to the SV, and it can catalyse profit-making with development impact (William and Hayes 2013, 27), nevertheless, there is a definite difference between the implementers of the different models. While the SV seems to lean towards the initiatives of international or multinational organizations, the focus of IBM in developing countries, on the other hand, is on a range of different company types which include domestic, and small and medium scale enterprises (William and Hayes 2013).

Both models could be applicable in theory to the AgResults initiative. However, in practice, the AgResults initiative shares a closer similarity to the IBM model. This is because of the type of implementing agency, that is, domestic private companies that are driving the implementation of business profits and the development impact approach. In addition to the similarity in the drivers, some challenges that have been identified in the implementation of the AgResults initiative that are also very similar to those encountered with IBM. For example, in one of the surveys conducted on companies wishing to incorporate IBM in their value chains, around 90% of the 167 respondents noted that access to finance, poor infrastructure, and a lack of qualified labour are some vital issues worthy of consideration (IFC 2012, 12). Most of these challenges are similar to the critical challenges encountered in the AgResults initiative.

5.2.2 The Nigeria AgResults Pilot Structure

The Nigeria pilot structure has four in-country entities: The Advisory Council (AC) board, the Project Management Unit (PMU), the implementers, and the smallholder farmers. These four entities can be further categorized into two interwoven layers; (i), the Country Governance and

Project Implementation Unit which is composed of the advisory council and staff of the PMU in Nigeria and (ii) the Field Implementation Unit, which includes the implementers and smallholder farmers. However, the PMU and the external verifier also provide support for field implementation work through monitoring and verification.

The Advisory Council Board (AC): Stakeholder involvement was set up from the outset of the project after conducting a stakeholder analysis across the maize value chain in Nigeria. The outcome of this stakeholder analysis led to the development of the advisory council (AC) board. The AC board is an independent in-country multi-stakeholders' partnership that comprises vital existing stakeholders locally. They are selected from the Federal Ministry of Agriculture and Rural Development, the Manufacturer Association of Nigeria, the Nigeria Export Promotion Council, and the National Agency for Food and Drug Administration and Control. They are representative of the open market, the private sector, and the Poultry Association of Nigeria.

The AC provides input on pilot implementation through periodic meetings. It acts as a forum for sharing knowledge about the pilot outcome, and it periodically reviews the progress of the pilot. The advisory council provides support on the scaling-up and sustainability plan of the project through institutions and mechanisms that enable regulatory frameworks, policy advocacy, and institutional capacity developments.

The Project Management Unit (PMU): This unit leads to the implementation of the project in the country. It conducts marketing and the promotion of the pilot, and publicizes the pilot (goals, requirements, and incentives) to attract a pool of participants in order to coordinate with relevant government ministries and international organizations.

It delivers essential extensions, and technical assistance to participating organizations on production, and maintains close communications with verifier entities to ensure efficient and independent testing and the verification of outcomes that trigger incentive payments. It calculates and certifies the participant awards reported by the verifier, and requests financial disbursements when pilot outcome triggers are met. The PMU facilitates the disbursement of incentive payments to participants meeting the required outcomes and maintains records of incentive payments subject to verification and audit.

The PMU also evaluates performance through two reporting cycles: a quarterly update and a semi-annual pilot project evaluation. It provides timely updates to the Secretariat and open access to information whenever possible to facilitate pilot modifications when necessary, and to enable reporting to stakeholders on impact and progress. It also provides a quarterly report

on the use of funds by the pilot implementation. It maintains records on the use of funds in pilot operations and includes 'lessons learned' on pilot implementation and operations.

External Verifiers: This entity is responsible for verifying if each potential recipient of an AgResults award has met the minimum thresholds of the project deliverables. In the case of the Nigeria pilot, the Cotty's Laboratory of the Agricultural Research Services of the United States Department of Agriculture (USDA), USA was contracted as the verifier.

Implementers and Smallholder Farmers: At the field operational level, the project works with two key groups: directly with agribusiness enterprises referred to as "implementers" under the project, and indirectly with smallholder farmers (AgResults 2014). The implementers are established domestic private companies or organizations with a strong focus on small hold maize farming. Most of these companies fall into the category of small and medium companies.

The implementers can be categorized into three groups. The first category consists of companies that are primarily project-based. The principal source of their funding is donors that are involved in diverse projects which are driven by a push mechanism, and by participation in the AgResults initiative. The second category of the implementers can be classified as medium-sized companies. In most cases, they have been in existence before the AgResults project commenced. They have proper organizational structures, and their sources of funding are private, and include commercial bank loans.

The last group, which is in the majority, comprises small firms with two to five core staff at the start of their participation in the AgResults pilot project. Their existence mostly pre-dates AgResults, and they are generally unstructured, with little experience in agricultural management. They have an informal working relationship with smallholder farmers that pre-dates the AgResult pilot implementation. They mostly source funds from within their organizations and have a low capacity to access commercial loans.

Smallholder farmers are defined as farmers with landholdings of not more than five hectares. They were not ordinarily able to produce a surplus before the AgResults pilot and were not engaged in market-driven agriculture. They have land, and sometimes labour while the implementer's share of the partnership includes the provision of support on best practices in agricultural management through training, technical assistance, provision or linkages to affordable quality inputs. It also includes marketing information systems, modern technology, and innovations that could contribute to their shareholdings in the agribusiness (AgResults 2012).

Smallholders are regarded as partners that work directly with implementers. The Project Implementation Unit cannot interfere in the relationship between the implementers and the smallholder farmers, which allows the implementers to engage in different business models that are not prescribed by the PMU.

The implementers are the primary medium through which access for rural poor smallholder farmers to all the resources required to overcome agricultural and structural barriers that generally impinge on their ability to produce are channelled.

All participant organizations that are classified as implementers must meet the following agribusiness minimum criteria. They must: (AgResults 2014);

- have the ability and capacity to organize and coordinate smallholder farmers through pre-planting, planting and postharvest handling of crops.
- provide support to smallholder productivity through extension and access to farm inputs; this could include having systems in place to add value to the production of maize or link farmers to a package of yield-enhancing inputs.
- have positive business references, ideally from farmers regarding the technical support they have received, and the fairness of the market prices they offer for their output.
- be able to organize a system of aggregation of their products and storage to support verification and sell to end-customers.
- have the capacity to train and monitor smallholder farmer groups on the use of innovation, postharvest management, safe transfer, and storage.
- work with, or have the capability to work with a selected group of farmers.
- have downstream market linkages to efficiently aggregate and sell quality crops at a premium.
- have a commitment to maximizing transparency, and disclosing records, and document sharing in relation to premium payments or other benefits concerning participating smallholders.
- have the capacity to produce periodic reports for the Pilot Manager. They must also agree to work with AgResults evaluators to learn lessons from the implementation and must agree to disclose business practices to AgResults evaluators.

5.2.3 The Implementation Crop

Maize is the pilot target crop for this model. Maize belongs to the cereal family in crops. Cereals are the most important source of total food consumption in developing countries. Their direct food consumption provides 53% of total calories (FAO 2012) in SSA. It is also one of the crops that could be cultivated across diverse agroecology in Nigeria (Olaniyan 2015, 156). Nigeria is the largest producer of maize in SSA, and the eighth largest producer in the world,

with a production rate of 10.5 MT in 2016, and a deficit of 4.5 MT from its targeted same production year (Zero Hunger Report 2016, 25).

Although there is technical and resource potential for a higher yield in maize production that needs to be harnessed (Smale et al. 2003), the average yield of maize in Nigeria is still meagre. The average annual yield of maize in Nigeria stands at 1.68 MT/ha compared to the USA, where the average yield is 9.3 MT/ha (FAOSTAT 2013). This low yield has been attributed to several factors which include the lack of the use of improved varieties of seeds, inappropriate fertilizer use, poor agricultural practices, and sometimes unfavourable weather conditions (Olaniyan 2015, 164).

Maize is one of the critical staple foods in Nigeria and is thus a source of food security. The high demand for a key staple food is supported by the fact that it is cheaper than other cereals like rice and wheat. Maize is also very important to crop production in Nigeria because of its economic importance to the country as a form of animal feed production (FAO 2016, 76). If the urbanization and population growth in Nigeria continues, the demand for maize use in feed production will likely grow as the population diversifies into meat consumption (IFPRI 2017, 20). This will create more demand for livestock, especially in the poultry sector which uses maize for feed production.

Between 80% and 90% of maize production in Nigeria is managed through smallholder farmers (Owoeye et al. 2017). Smallholder maize farmers, however, tend to have limited access to yield-enhancing inputs and sporadic linkages to downstream markets, both of which limit their productivity. Nonetheless, smallholder farmers have the potential to yield significant increases if connected to markets and technical assistance in the right way.

5.2.4 The Nigeria AgResults Pilot Operation Process

There are vital processes, procedures, and activities involved in the implementation of the Nigeria AgResults pilot. The approach adopted under the project to achieve these is outlined in Figure 5.2.

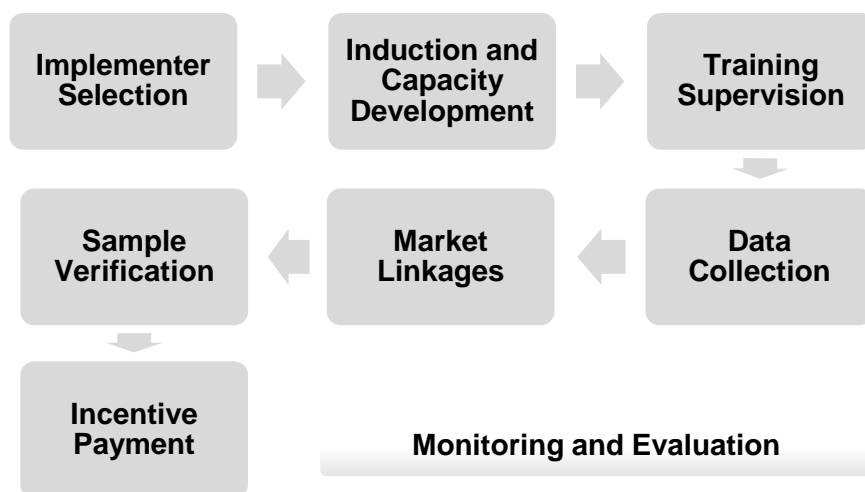


Figure 5.2: The Nigeria AgResults pilot operation framework

Implementers Selection: The annual implementation of the project commences with the design or review of the Invitation to Participate. An Invitation to Participate was designed to describe the Nigeria Aflasafe pilot challenge, with the specific target to engage private sector companies in agribusiness activities. The Invitation to Participate document was prepared by the lead of the project management unit in collaboration with the Secretariat. The document explains the terms of engagement for potential implementers in about three key areas, which included eligibility and participation requirements, verification processes, and incentive payments. Once the document is in place, publicity through print media for the dissemination of the Invitation to Participate document commences.

In Nigeria, the Aflasafe challenge is advertised in popular national newspapers. When disseminated, the Invitation to Participate is usually accompanied by an application form. Opportunities are given to prospective implementers to set out details of projects and information on how to participate in the implementation is offered. Applicants can attend information sessions organized by the Project Management Unit. All potential implementers are encouraged to attend these sessions which are held in the North and South regions. The potential implementers submit their applications directly to the secretariat between 30 and 60 days after the advertisement is made through a dedicated email that the Project Management Unit does not have access to.

In the first selection process, the donor uses a selection committee to identify the most suitable applications. The selection committee comprises the Pilot Manager, a member of the AgResults Advisory Council, an external agribusiness consultant, and a senior project

administration staff. Some pre-selection criteria are used to set a benchmark for selecting the most qualified implementers. This benchmark is used for the first reviews of each application and the scoring of each company or organization to see how closely they match the criteria. Each committee member individually scores the applications, and a central office then collates shortlists and compares and adds scores. The average for each applicant is used to finalize those that will be recommended to the Secretariat for the second stage of selection.

At the second selection stage, field visits to prospective participant organizations are conducted by the PMU. Some of the claims in the application are verified during the second stage. Some of these include the availability of a warehouse, as claimed in the application forms and official registration documents of the company or organization with the Nigeria Corporate Affairs Commission. The government body also has the statutory responsibility of registering private companies in Nigeria. They check the strength of the company or organization and the company's financial status based on their bank statements or/and audited reports.

Both levels of selection are essential to avoid the inclusion of bogus companies as implementers, and to ensure that the prospective implementers possess the capacity and capability required for a pull mechanism-driven initiative. At the final selection, applicants who meet all the criteria for the second stage are recommended to the AgResults Secretariat.

Induction and Capacity Development: The annual Implementer Induction and Capacity development workshop is a platform designed to disseminate detailed information about the AgResults Initiative, and the Nigeria Pilot Project. Its remit is to train implementers on good agronomic processes to boost maize production as well as disseminated key agribusiness principles to support the proper implementation of the project.

All selected and successful organizations are officially invited to an annual induction and capacity development workshop. During this period, they are trained in various areas ranging from Good Agronomic practices (GAP) to boost their maize production and skills in Agribusiness management.

At the Induction and Capacity Development Workshop, new implementers are formally inducted into the Nigerian Pilot Project. The Letter of Agreement (LOA) is signed by the implementer organization and the PMU during this event. The LOA stipulates each party's responsibilities. It sets out the procedures for an audit in the event of verification discrepancies, and it identifies dispute resolution mechanisms. It rubber stamps the agreement regarding the pilot implementation process.

At this three-day event, new implementers are encouraged to network with old implementers on projects, and to share experiences. Agribusiness support consultants, financial institutions, and maize product producers/off-takers are invited to participate in the workshop to share relevant information which the implementers can then leverage to ensure the successful implementation of the project in their respective locations.

Training Supervision: As part of the capacity development of the project, all the implementers are supported with a softcopy of all training materials. The implementers are permitted and encouraged to translate and print softcopies of the document, and other resources to conduct step-down training for all their farmers. They are also encouraged to use their business ventures. The PMU annually monitors and supervises training conducted by the new implementers to provide support, and technical backstopping in the areas where a capacity need has been identified. They also randomly spot check the old implementers to reduce the level of dependency on old implementers on the PMU.

Data Collection: The PMU collects several periodic ex-ante and post-ante data from all the implementers. Annually, surveys are conducted to gather data on the various socioeconomic and agricultural productivity parameters of the project. Data are collected from 10 percent of all smallholder farmers working under all the implementers. These smallholder farmers are randomly selected from all the farmers working on the project. This data supports measurements such as the type and quantity of inputs used, the yield obtained, the amount of maize aggregated for sale at formal markets, the amount sold at informal markets, and the quantity kept at home for consumption and other uses.

The PMU also collects data on the general details of all farmers participating in the project under each implementer. This data includes names, locations, contact details, and planting dates. The GPS coordinates of all farmlands under the project are recorded to measure the actual size of the farmlands cultivated by each farmer annually. The project uses this medium to verify the authenticity of the farmers, and the dimensions of their farmlands. The implementers liaise with the PMU in carrying out this activity. The details captured include the name, size, and locations of farmers' fields.

Sales data are collected from all implementers to record the quantity and price of the treated maize marketed. The price of untreated maize in the market on the day treated maize is sold is also collected along with the details of the type (feed, food, domestic, or international) of buyers of the maize.

Market Linkages: The Innovation Platform (IP) approach is used to facilitate business relationship building between several actors, along with the maize value chain that includes

food and feed processors, poultry industries, and implementers. This is usually a non-sponsored meeting held at least once every year. The event is specifically unsponsored by the PMU because it is expected that a business should engage in the marketing of their product as part of their business plan. It is therefore expected that funds will be used to support that activity.

The IP facilitates a better understanding of market challenges through discussions on market requirements (quality, quantity, and time of sales), the nature of the supply and demand of maize produced by the implementer, the creation and enhancement of the business relationship between implementers and end-users of maize, and the common business challenges encountered.

Sample Verification: Aflatoxin contamination has a wide-ranging impact on agricultural productivity, health, trade, and food security. A World Bank study revealed that the European Union regulation on aflatoxin cost Africa US\$750 million each year in exports of cereals, dried fruit, and nuts. Biocontrol of aflatoxin was evaluated as being one of the most cost-effective aflatoxin control methods, with the potential to offer a long-term solution to aflatoxin problems in Africa. In response to these challenges, IITA and partners developed a natural, safe, and cost-effective biocontrol product called aflasafe; an indigenous biological control technology to mitigate aflatoxin contamination in maize and groundnuts. Adoption of aflasafe, with other management practices will reduce aflatoxin contamination by more than 70% in maize and groundnut (Bandyopadhyay et al. 2016).

To be sure that the quality of maize produced under the project meets the standards of the premium domestic market that demands quality products, the PMU, in collaboration with the Secretariat, developed protocols for periodic sample collection and the verification of the maize aggregated. These protocols are reviewed annually to accommodate the growth of the project. This protocol was designed to verify aflatoxin levels in treated maize. The adoption and efficacy of aflasafe reduces aflatoxin in the maize crops.

These verification exercises are carried out at the project-designated aggregation points. In the store, bags are tagged with the farmer's details and arranged according to the quantity supplied by each farmer. To avoid double-counting at these aggregation points, each bag in a verification batch is marked with the farmer's details and date of delivery for traceability. These batches are isolated from new bags of maize entering the storage facility unless all the previously verified maize has been disposed of.

Representative samples collected by PMU staff from the aggregated lots are conveyed to the Pathology Laboratory of the International Institute of Tropical Agriculture in Nigeria. These are

subjected to initial tests for aflatoxin reduction and aflasafe prevalence using the Vegetative Compatible Grouping (VCG) system. The DNA of the maize is subsequently extracted in the IITA laboratory and transported to the external verifier (the Cotty's Laboratory of Agricultural Research Services of the United States Department of Agriculture, USA) for further analysis. The analysis is carried out with the use of a more sophisticated method (Pyrosequencing), which is not currently available in Nigeria. The approach allows for independent verification of the aflasafe prevalence in the maize, and also allows for a comparison with the VCG results from IITA (Bandopadhyah et al. 2016).

Incentive Distribution: Once the analysis is complete, the results are forwarded to the PMU, that checks these against the data collected initially from implementers. The data include the number of samples collected, the total expected maize production, based on overall numbers of farmers working under each implementer, the size of the farm, and the annual average yield of the implementers. These substantiate the veracity of claims made by the implementers.

Once this analysis is complete, and there is no ambiguity, the implementers whose sampled maize meet the minimum aflasafe level for premium payments (> 70% aflasafe prevalence) aggregated are paid a premium of US\$18.75 for every MT of high Aflasafe-treated maize in batches.

Table 5.1: Aflasafe prevalence requirement for an incentive payment

| Prevalence of Aflasafe™ in the sample | Premium paid out |
|---------------------------------------|------------------------|
| 70–100% prevalence | US\$18.75 for every MT |
| < 70% prevalence | Zero |

Although the implementers are expected and required to share their incentives with the smallholder farmers that they work with, the approach adopted in incentive sharing between the implementer and the smallholder farmers differs. The sharing method is determined by the business model adopted by each implementer. Recent case study analysis, however, revealed a preliminary outcome that shows that all the implementers seem to focus on is three different models. Some implementers adopt a percentage direct cash share of the incentives with the smallholder farmers, and also benefit from a profit share of the business. Others share a proportion of the incentive with the smallholder farmers in the form of a voucher that is used as a part payment of the inputs in subsequent years. They share a percentage of the profit from business sales. Others ensure that a percentage of the incentive fund is used to discount input purchases and share the benefits or premium with the smallholder farmers.

The external evaluator report shows that the implementers share incentives with farmers directly in only in a few cases. However, they make use of most of the incentive to develop their businesses. For example, the bulk purchase of inputs is distributed early at some cost to the smallholder farmers, and the provision of services indirectly benefits the farmer's productivity and income through increases on their return (Tulika et al. 2019, 49). . This clearly shows that implementers and smallholder farmers benefit from the premium of the sale of the maize at an average of 8% and 9%, respectively, between 2013 and 2017 (AgResults Annual Report 2017). This premium is in addition to the profit that the farmers make because the implementer has engaged in a marketing strategy focused on high-end users of maize (but the quality must meet the expected standard).

Monitoring and Evaluation: At different stages of the project implementation, the PMU collects several types of monitoring data. Surveys are conducted to gather data on the various socioeconomic and agricultural productivity parameters of 10% of the smallholder farmers working with each implementer in the project. Indicators of these parameters include inputs used, the yield obtained, the quantity of maize aggregated, and the use of the aggregated maize. Representative maize samples were also collected from lots aggregated by the implementers to quantify aflatoxin using a lateral flow device and the presence of Aflasafe strains (atoxicogenic fungi) using Vegetative Compatible Grouping analysis and pyrosequencing. Lastly, sales data are collected from all implementers to record the quantity and price of the treated maize marketed. Data on the price of untreated maize in the market on the day of the sale of treated maize are also collected.

An external evaluation also collects periodic data and measures the pilot's impact on private sector engagement using qualitative methods over the interval from early 2014 to early 2017. The baseline occurred in early 2014, and the end line happened in early 2017. It used a theory-based qualitative approach—the Structure-Conduct-Performance (SCP) framework—to collect its data (ABT Associates 2014).

5.2.5 The Nigeria Implementers Agribusiness Framework

As earlier mentioned, the second layer of the project is the Field Implementation Level, whereby the business relationship between the implementers and smallholder farmers take place. In general, the AgResults framework has nine pillars that support the business and development relationship between the implementers and the smallholder farmers.

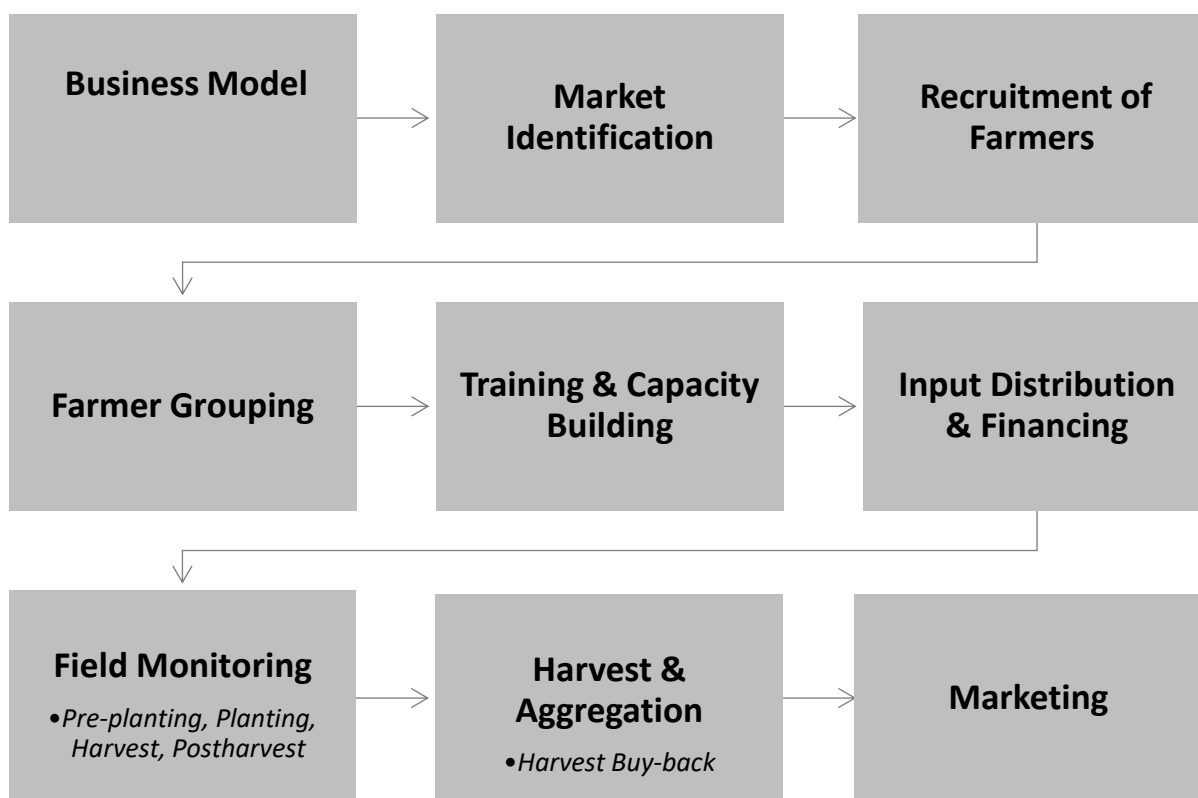


Figure 5.3: AgResults implementers agribusiness framework

Identification of Business Model: At the start of the implementation year, the implementers adopt an agribusiness management approach suitable for their business by developing an organizational strategic plan and an overall business plan. They also source sustainable business finances or credit.

Depending on the need, and level of financial resources of the implementers, they also identify their human resources needs, and adopt different approaches to staffing. While some implementers recruit full-time staff, others recruit part-time staff with a few full-time core staff. Some others approaches include the use of ad-hoc staff as the need arises along with some full-time core staff.

Regardless of the approach adopted, all the implementers provide training and capacity development for their staff. They train them in agronomic practices and basic agribusiness management, which includes agricultural data management, book-keeping, and information management. Such training is essential, because the staff act as an extension of the service, or an agribusiness advisory conduit between the implementers and smallholder farmers, notably with the cluster and trusted leaders (see below). These staff also provide agribusiness support for smallholder farmers, substituting public sector-driven extension services that are becoming ineffective.

Market identification: As part of the agribusiness training provided by the PMU to the implementers, the implementers are encouraged to adopt a demand-driven approach to their business (based on the specification and requirements of processors) rather than supply-driven (production without prior understanding of market need). The supply-driven approach is the norm, and the dominant practice in agricultural production amongst subsistence smallholder farmers (NEPAD 2013, 29), before the AgResults initiative.

As a result, most implementers engaged in early market identification to understand the specific requirements of different buyers. Many have a general idea about needs in the maize market. This understanding guides and determines the type of maize they will recommend for planting. To achieve this, they build on the network of participants in the annual IP mentioned earlier and engage in further independent market sourcing for their products beyond the IP.

Farmers Recruitment: The implementers select the smallholder farmers that they will work with on an annual basis. This selection is independent of the PMU. Smallholder farmers are selected based on different criteria set by the various implementers. Some of the criteria that are common to all the implementers include, a history of the farmers in agricultural practices, their knowledge of maize farming, and their level of interest in production for the market. Despite the different selection criteria by the implementer, they all must include key project implementation criteria for smallholder farmers of the type outlined earlier. In general, the implementers screen all the farmers, and select those that closely match their criteria for a business venture.

Farmers Grouping: Once the farmers are recruited, and depending on the type of business model adopted, the implementers could cluster the farmers, and group them before or after the training occurs. In most cases, implementers with small numbers of farmers in the first year of implementation tend to group their farmers after initial training, possibly to save costs.

Each farmer is clustered in a group, generally referred to as a Trust group. A Trust is expected to have collective responsibility, and be accountable to others within the group. The Trust group is generally composed of between 10 and 20 smallholder farmers with a farmer leader for each group. Some trust groups are further clustered together in another, larger group, composed of between 100 and 150 smallholder farmers headed by a cluster leader. Both the leaders of the trust, and the cluster group act as a bridge between the implementers and the farmers, especially where the implementers are working with large numbers of farmers in various locations. Each farmer, Trust, and Cluster group under each implementer is given an identification code specific to the farmer, Trust, and Cluster group. The codes are submitted to the PMU for documentation and are used by the PMU for data collection.

Different Trusts, Cluster groups, and their leaders that demonstrate outstanding annual business performances through an increase in production and quality crops are rewarded periodically through various means. These range from cash rewards to increases in input support and specific input subsidies. The award ceremonies take place during annual gatherings in the different communities where projects are implemented. This is a symbolic way of sustaining the interests of the smallholder farmers in group work. It enthuses them and motivates quality performance.

Farmer Training: There are different layers of training, beginning with the planting of pre-harvest crops and this training is provided by the implementers. The first stage of training focuses strongly on pre-planting and planting activities with an emphasis on good agronomic practices, basic agribusiness principles, bookkeeping, group work, and information sharing systems.

Implementers in large numbers (500 and above) of farmers generally conduct training based on cluster locations. The implementers provide training to all the cluster leads and all farmers under each cluster locations. This training is usually conducted in the village, at local government, or at state level depending on diverse factors which range from the availability of funds, and a number of farmer clusters in each location. Where the implementer has a mid-range number (between 300 and 500) of farmers, the first level training by the implementers is conducted by their staff to trusts, and cluster leads. Subsequently, the implementers engage the trust and cluster leads in second level training in each trust group. In other cases, where the numbers of farmers are small (below 300 farmers), and the locations are close in proximity to each other, the implementers provide direct training to all farmers and to the trust and cluster leads in the same location.

In all cases, there is continuous monitoring by all three strata (staff, cluster, and trust leaders) with periodic reporting at different levels to the implementers while the PMU staff carry out periodic spot-checking on both the cluster and the trust. The PMU staff attend all of the implementer training, and randomly attend training sessions for old implementers if they provide their training more than once in multiple locations. Although the PMU's role during the training is observatory, it is also essential for the PMU to use the monitoring system to gauge the consistency and the quality of the information transferred by the implementers to the farmers. This also gives the PMU the opportunity to be guided on areas that require improvement, especially with the new implementers. Random checks and monitoring are also completed on selected old implementers during their training sessions to ensure continuity in the quality of information disseminated.

Input and Input Financing: In overcoming the existing structural problem of access to input, the implementers provide farmers with different types of necessary inputs, to enhance the quality of their products and increase the quantity. They also access and engage the smallholder farmers in the use of innovation that will be essential for the production of quality maize. For example, as part of the overall input support, all the farmers under the implementers purchased an innovation (Aflasafe), a biological control product developed by IITA and its partners to control the ravaging aflatoxin problem in maize crop (Bandyopadhyay et al. 2016). Up until that period, Aflatoxin in maize limited the ability of maize producers to access diverse maize markets, particularly those that could pay a premium for quality products.

Harvest advances are also provided as a means of credit financed by most of the implementers to the farmers working with them. Smallholder farmers have constant needs, and where their agricultural product is the major source of income, often, farmers are compelled to sell some or most of their farm products to buyers that have the money. These buyers take advantage of the poor smallholder farmers who offer low prices for their products at the farm gate. The support in harvest advances reduces the constraints placed on smallholder farmers when they sell produce at the early stages of the harvest at a low price.

The ability of the group to honour the business agreement, particularly the input loan and credit, determines continuity with the implementers in subsequent years.

Field Monitoring: The cluster and trust group leaders provide periodic and timely monitoring of the group and their farm-management activities, from planting to harvest. They provide a periodic report to the implementer's staff assigned to the different clusters and trust groups. In most case, inputs are distributed to all the farmers directly by the implementers, to avoid possible rent-seeking by both the trust group leaders and the cluster leaders. However, the cluster leaders support their staff in the continuous supervision of timely and appropriate input utilization. As part of their role, they also help the implementers with information dissemination to support the smallholder farmers.

Harvest and Aggregation: As part of the planning process for harvesting, the implementers engage in second level training with a focus on harvest and postharvest management issues such as threshing, winnowing, cleaning, bagging, storage, and aggregation procedures and processes. The smallholder farmers inscribe an identification code generated at the beginning of the process on each bag of maize produced. Where the farmer is not literate in the English language, the trust leader and household member who is generally educated in the English language provides support. Labelling is very important for the verification of the individual,

trust and cluster and for the productivity, performance, and traceability of the aggregated maize.

The proportion of maize collected by the implementers from the smallholder farmers is based on the cost of the input and financial credit given to the farmers by the implementer, with interest paid. The interest rate is strongly dependent on the source of finance by the implementers amongst other factors. As earlier mentioned, on some occasions, farmers increase the proportion of maize given to the implementers beyond the agreed volume. This proportion beyond the agreed volume is, however, voluntary, and many of the smallholder farmers tend to aggregate their maize through the implementers.

All the maize is aggregated by the different trust groups. The initial aggregation is carried out in community aggregation centres where farmers pay tokens to keep their harvest. This contrasts with more dated practices of keeping the maize at home, where it is subjected to poor storage practices and postharvest loss. The cluster group and the staff of the implementing company subsequently collect all of the aggregated maize under each trust or cluster, depending on the number of farmers the implementers are working with. They inscribe the trust and cluster code before transferring produce to a dedicated implementer warehouse for quality analysis, verification, final labelling, and marketing.

Marketing: The market linkage workshop organized by the project has proven to be a useful avenue for creating linkages between the implementers and buyers. Some off-takers and implementers from the workshop engage in contractual agreements with the implementers after the workshop. However, implementers are primarily responsible for sourcing their market, and the possible premium market for the quality maize produced.

The implementers market their product using various marketing strategies. They conduct a market survey before planting to ensure that production is demand-driven, and to understand and segment the market. A premium is paid for high quality maize. They further use a high-volume aggregation system along with value addition, through sorting, labelling, sampling, and quality analysis to bargain for premium prices from the niche buyers. As mentioned, earlier, credit is given to the smallholder farmers for produce advanced from the harvest. They are also able to delay sales of high volumes of their maize until the prices of maize become favourable.

5.3 The Impact of the AgResults Pilot Initiative on the Structural Constraints Faced by Smallholder Farmers in Nigeria

As discussed in the previous chapter, several underlying factors can determine smallholder participation in agribusinesses, such as low returns on labour, a lack of access to, and

distribution of resources, a lack of infrastructure due to urban bias in development, and inconsistent micro and macro policies. Other factors include trade liberalization and climate change, inadequate working capital, and the fragmentation of smallholder farmers (Baumann 2000; De Janvry et al. 2001, Lee et al. 2009, Tersoo 2013). These factors can place restrictions on the ability of smallholders to adjust their practices to optimize returns on their investment. Private sector engagement has been identified as critical in bridging this gap so that smallholder farmers can adjust to and participate in agribusiness (Zero Hunger Report 2016, 25).

However, in the face of limited demand, private sector actors also face some constraints, ranging from high fixed costs to enter the market to awareness campaigns. The provision of lines of credit, since agriculture is resource-intensive and investment is necessary, is considered to be high risk (Chikaire et al. 2014, 115; Golden 2014, 10). Other exogenous factors, such as poor roads and transportation, weak infrastructure, weak institutions, and poor policies can also limit the participation of the private sector in agribusiness (Olukunle 2013, 39). When one or more failures are present, this can mean market opportunities are missed, and this can reduce investment in agricultural development by the private sector (Abbas 2012, 99).

Over five years, the AgResults Pilot Initiative in Nigeria has demonstrated how domestic private Agricultural enterprises can work with smallholder farmers to create effective and efficient systems that are critical to the development of value chains at both the downstream and upstream in the agricultural sector. These agricultural enterprises bridge most of the key structural gaps that are seen as critical challenges to smallholder farmers seeking to engage in market-driven agriculture.

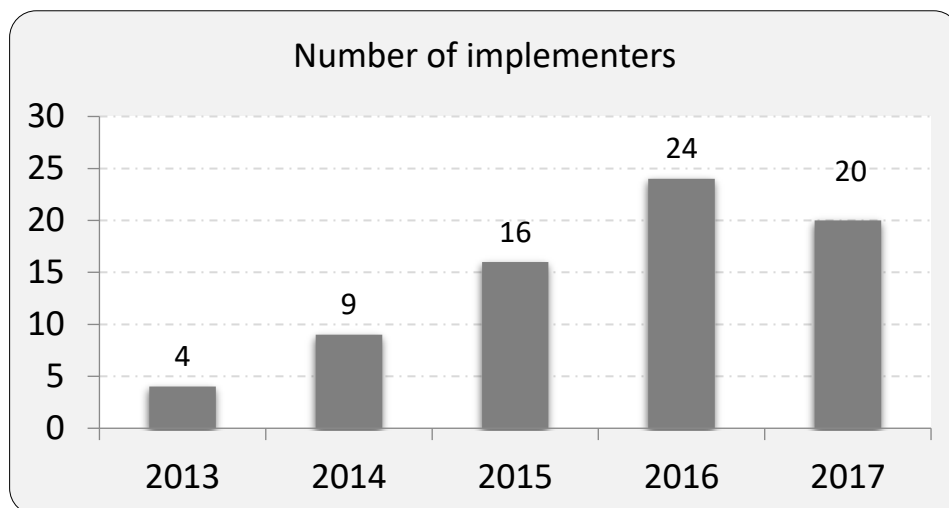


Figure 5.4: Agricultural enterprises growth under AgResults initiatives

Source: AgResults Pilot Initiative Annual Report 2017

Through the pilot intervention, the number of private businesses that “implemented” the project grew from 4 in 2013 to 20 in 2017. A similar growth pattern was experienced with smallholder farmers working with agricultural enterprises, with an average growth per implementer increasing from 254 in 2013 to 1280 smallholder farmers per implementer in the fifth year (AgResults 2017).

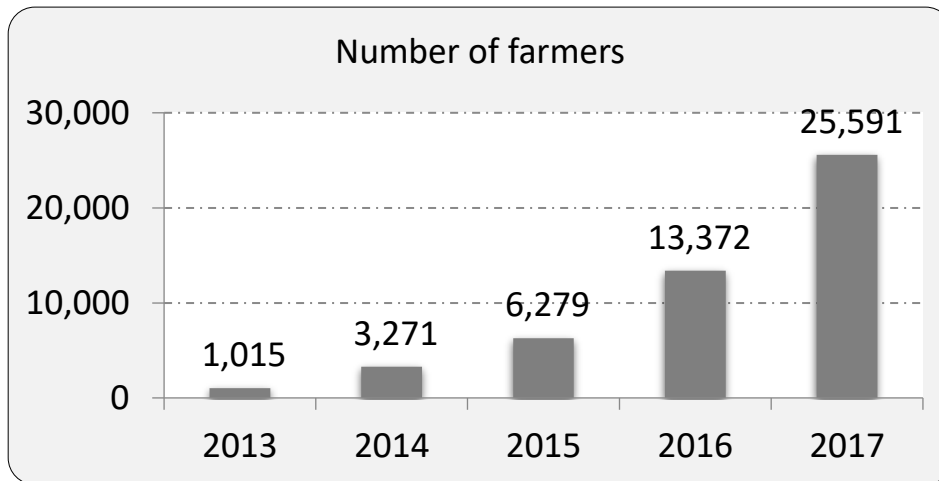


Figure 5.5: Smallholder farmers growth under the AgResults initiative

Source: AgResults Pilot Initiative Annual Report 2017

Agricultural enterprises also demonstrated that an innovative approach by the private sectors could significantly overcome some of the structural challenges that the agricultural sector is facing in Nigeria. The initiative enables poor farmers to access resources that were initially difficult to obtain so that they can provide capacity development and develop a system for knowledge transfer in developing the right skills for agribusiness.

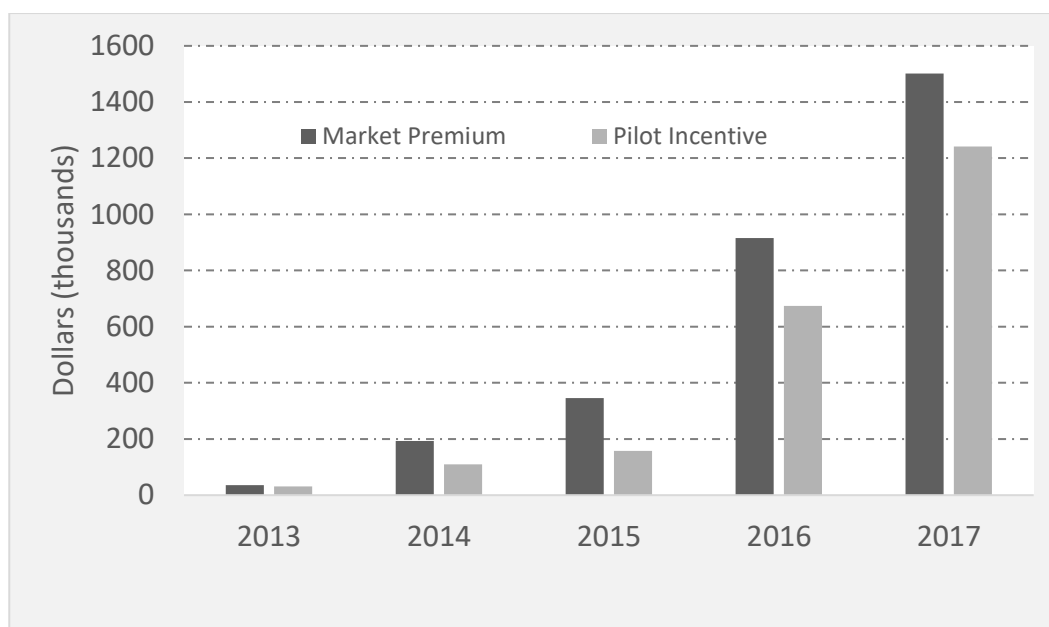


Figure 5.6: Total pilot premium and pilot incentives in the AgResults initiative

Source: AgResults Pilot Initiative Annual Report 2017

Consistently, over five years, the implementers and the farmers received premium prices for their maize due to its quality and to effective marketing strategies that target high-end companies. These companies require quality maize of the standard that is produced by the implementers and farmers. As part of the pull mechanism approach, they were also incentivized by the donor to produce quality maize. The premium received from the market was, however, consistently higher, year on year across the five years compared to the incentive, showing that sustainable business can be driven by profit and premium prices, rather than incentives.

The intervention of the implementers and key outcomes are outlined below.

5.3.1 Access to Resources : Information, Inputs and Finance

Access to resources for agricultural production is inadequate in Nigeria. Current data shows that only about 5% of Nigerian farmers use improved seeds because there are significant problems with seed quality and pricing. Where farmers manage to procure some of these inputs, because of their level of illiteracy, they are also exploited by the suppliers of the input (FMARD 2011 and 2016). The fertilizer application rate is also meagre, at approximately 13 kg/ha of arable land; a small fraction of the global average of 100 kg/ha. The percentage of farm plots that was irrigated was exceptionally low at 3% in 2011. This decreased further to 1.7% in 2016 (FMARD 2011; Olomola and Nwafor 2017, 36). In an FAO report (2017), it was estimated that, in Nigeria, the average ratio of tractors to arable land was 0.2 tractors/100 km², which is far below the average SSA of 14 tractors/100 km². Of the total annual crop production,

there is a current storage capacity for just 300,000 MT, and this represents an enormous deficit for the storage of grains in Nigeria (FAO, 2017).

The implementers engaged in many innovative and cost-cutting initiatives to support their agribusiness. They also invested in supply, demand, and value addition (Narayan et al. 2019). For example, using common group information services developed in partnership with a local mobile telecommunication company, the implementers provided real-time agricultural information from planting through to harvest. This included data on climate and market conditions affecting smallholder farmers, and the information was disseminated in local languages. In another instance, some implementers rebuilt abandoned and dilapidated on-farm and community storage facilities that were initially built by the State Government. They made these available for use by smallholder farmers within their community, on a cost per use basis. Income from the facilities was used to maintain community storage facilities, and to construct more community storage within the community as the farming base expanded.

The use of community storage facilities has reduced the level of postharvest loss that occurred through improper storage at downstream (i.e. at farm and community levels), and in part has decreased early sales of the maize produced beyond the quantity that the farmers are interested in selling because of lack of community storage.

Access to finance or credit is one of the key constraints to engagement in agriculture in general (Egwuatu 2008; CBN, 2011; Olukunle 2013). The implementers are overcoming the challenges of access to finance by sourcing and combining diverse, innovative financing approaches (Narayan et al. 2019). This approach includes accessing commercial loans and government agriculture credit facilities through schemes such as the Anchor Borrower Scheme (CBN, 2015). Direct financing can be obtained by the company's base on profit and incentives earned through best business practices. In the external evaluator's report, it was revealed that the three top reasons why smallholder farmers engage with implementers are their ability to produce healthier crops (51%), output purchase guarantees (36%), and the chance to receive input on credit (33%) (ABT Associates 2017).

Within five years, the implementers received a total of US\$1,482,124.5 on the sale of their quality maize to niche markets (AgResults 2017). This represents an average of between 13% and 17% on the sale of grain annually, while the smallholder farmers received an average of 11.5% of premium payments (Narayan et al. 2019; AgResults Annual Report 2018). All the implementers accessed a total of US\$972,387 of incentive through the AgResults Pull mechanism reward to achieve efficient business results that matched the defined development problems and outcomes that were achieved in four years. Both the incentive and premium have become a critical source of finance for the implementers, and the smallholder farmers

because these complement the commercial loans that are difficult to access, especially at the early stage of the business lifecycle.

Access to these funds would have been difficult for farmers due to their limited agribusiness knowledge, their inability to document production history, and a general lack of skills in business financial records. The financial institutions also require collateral that many farmers do not have (Khan 2008, 18). The ability of the implementers to access funds has also strengthened their capacity to provide harvests in advance to farmers. Receiving cash before and immediately after harvest helps the farmers to retain some of their maize until the price of maize becomes favourable. This also reduces the problem of side selling. Sales at formal markets therefore increased from 54% to 66% between 2013 and 2017, while sales at informal markets associated with side selling reduced from 38% to 13% between 2014 and 2017 (AgResults pilot Annual Report 2017).

Figures 5.7 and 5.8 show that access to finance (premium payment from the market and incentive by the donor) by the implementers and the smallholder farmers is proportionate to increases in production and aggregation (Narayan et al. 2019). As access to finance through both incentives and premiums received under the agribusiness increased, especially from year three, production and aggregation rates from the implementers also increased. Funds were available to cultivate more land, purchase more inputs, and provide input finance to smallholder farmers to drive cultivation. This also supports quality.

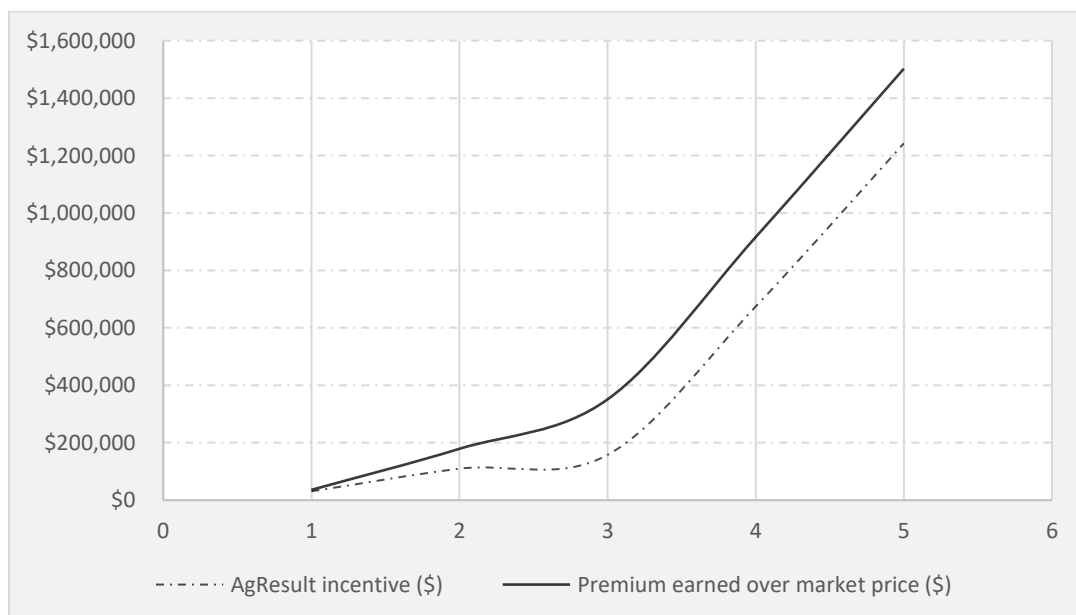


Figure 5.7: AgResults annual incentives received compare to annual premium earned
 Source: Authors computation derived from the AgResults Pilot Initiative Project Data 2017

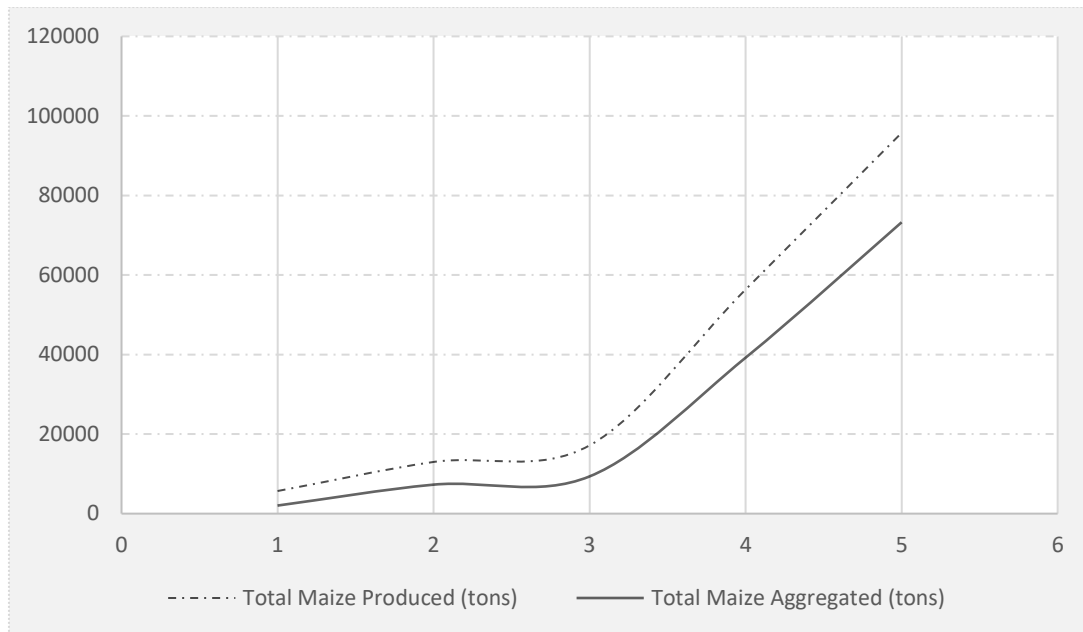


Figure 5.8: Total annual maize production compared to total annual maize aggregation.

Source: Authors computation derived from the AgResults Pilot Initiative Project Data 2017

That the premium over the market price also exceeded the incentive over the five years represented in the graphs is a pointer that the financial sustainability of the initiative will most likely depend on the output market, and profit rather than on the incentive.

5.3.2 Access to Market

Fragmentation of production by the smallholder farmers has made the costs of production high on an individual basis (Taylor et al. 2009). Transportation and electricity that are both essential for processing and the storage of crops are scarce. Smallholder farmers are not able to purchase diesel or petrol as alternatives because these are costly (Olukunle 2013, 39).

The Implementers provide both on-farm and off-farm facilities such as threshing machines, and community aggregation and storage facilities. They also ensure efficient and periodic transportation for easier and timely access to the market. Under these business arrangements, they engage in the aggregation of crops produced by the smallholder farmers to reduce fragmentation in the sales of their farm produce. This increases their bargaining power for profitability. Aggregation improves the negotiation powers of farm producers and increases access to niche markets with better pricing (Narayan et al. 2019).

The new approach focuses on a demand-driven, rather than the supply-driven approach that has permeated subsistence production for many years. It limits their ability to produce according to the specification of markets or buyers, unlike the approach that was adopted by

the implementers who strengthened the sales of their products to niche markets. Through this approach, they tailored their production towards market dynamic changes and needs.

As a result of the consistent interventions of implementers over five years, both the implementers and the smallholder farmers have been able to market most of their products in commercial markets and have benefited greatly from premium payments for the products they sell to food and feed industries (Narayan et al. 2019). Implementers received between 8% and 17% price premiums for the different pilot years between 2013 and 2017 (AgResults Pilot Annual Report, 2017).

Questions as to who benefits from the distribution of gains along the value chain in such schemes have been raised (Warning and Key 2002; Miten 2012). An independent report from the external evaluator showed that both the implementers and the smallholder farmers benefit from the premiums they received. In its report, it pointed out that a premium of about US\$130/ha, which amounts to 19% more on maize revenue per hectare was received on average by smallholder farmers each year (Narayan et al. 2019). This US\$130 premium is equivalent to three months of minimum wage payments in Nigeria. Overall, grain lots fetched, on average, a 542% return on investment from the sale to anchor buyers each year (AgResults Pilot Annual Report, July 2017).

5.3.3 Increased Agricultural Productivity through Efficient land use

In Nigeria, on average, the farm size of smallholders ranges from between 0.7 to 2.2 hectares, with a high percentage of farmers falling within the lowest range of 0.7 hectares (FAO 2015). Not much difference was seen under the implementation, with just a slight change in land use, from an average of 1.4 hectares per farmer to 1.5 hectares per farmer in the five years of the implementation (AgResults Report 2017).

There seems to be a more efficient use of land, despite the slight change in cultivated land, because of the higher yield recorded on the same land year on year. As a direct result of the implementer working with the smallholder farmers, average yield gaps in maize production increased from a national average of 1.68 MT/ha (FAOSTAT 2013) to an average of 3.5 MT/ha in five years (AgResults 2017).

One of the approaches adopted for the efficient use of land is the use of GPS by all implementers to measure the farmlands of smallholder farmers working under the project. The use of GPS was not put in place before the implementation, and since accurate figures about farm sizes were absent up to this point, it was less possible to estimate the human resources, financial, and time inputs that were required for annual production. Further, it was not possible to say how these could impact on profitability. Annual results from GPS compared to initial

estimations showing that most farmlands were not as big as farmers had assumed, they were before the intervention. Using the GPS, the farmers working with the implementers had a better understanding of their land assets, and one of the reasons why their production in the past had not chimed with that which was forecast.

The use of GPS measures has helped to produce closer to accurate costs of production. This means it is possible to enhance proper business planning, and plan towards resource provision with an understanding of the finances required for production. In addition, this has further helped to maximize the use of land for efficient production through input, technology support, and proper agribusiness planning.

5.3.4 Access to Technology, Research Extension Services

The current extension services in Nigeria are grossly inadequate. Currently, agricultural extension services are based on one extension worker for 25,000 smallholder farmers in Nigeria. When this is compared to best practice, one extension officer serves between 500 and 1000 farmers (Abduquadri and Mohameed 2012, 537). Most techniques and innovation that have been developed by several agricultural research institutes in Nigeria have remained on the shelf of the research institute for a long time, often because of the inefficiency of extension services. Where extension services are available, the officers are ill-equipped with the knowledge and skills that are required for modern approaches to agribusiness. As a result of this deficiency in extension services, there is a clarion call for a shift from public sector-led to private sector-driven extension services in Africa, and this is gaining more traction (Berthe 2015, 6).

The implementers act as the conduit between the research, farm, and town, substituting and complementing scarce extension services throughout Nigeria. They provide periodic support for smallholder farmers in the critical areas that require their support, such as through offering appropriate training in agronomical practices, and business and management support in farm and agricultural management. They also offer agricultural information services, and support for linkages to the market. The implementer has revitalized these necessary extension services.

They also adopt innovative means to overcome the barriers to adopting innovation. They demonstrate that private-sector involvement in innovation delivery significantly influences how farmers can be reached with available technologies. Most of these agricultural enterprises, along with the smallholder farmers, have benefitted from adopting such technology, with positive impacts observed on the improvement of the quality, quantity, and profitability of the maize produced.

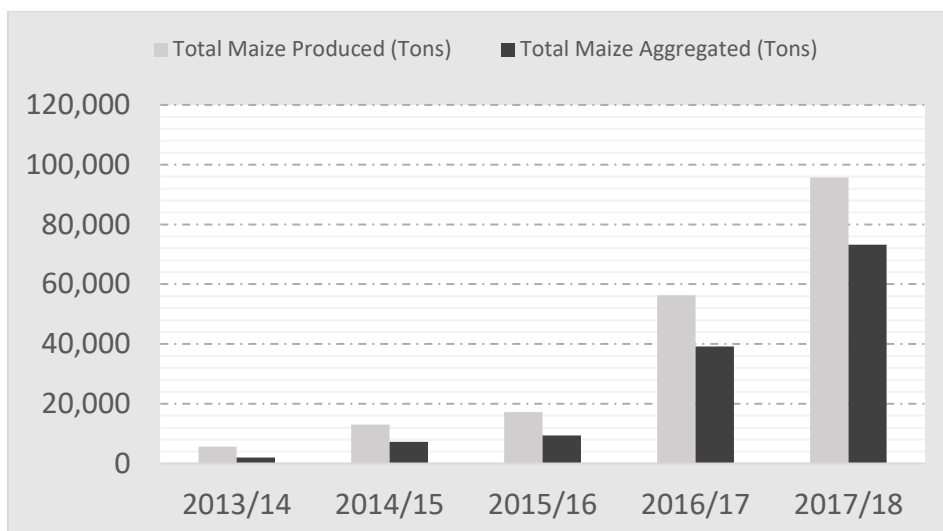


Figure 5.9a: Annual maize production compared to aggregation

Source: Author computation derived from AgResults Pilot Initiative Data 2017

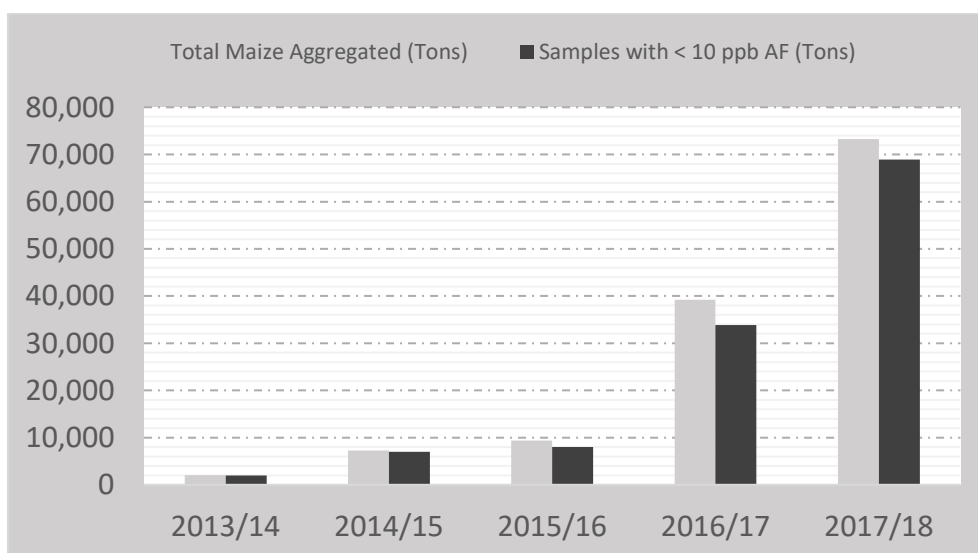


Figure 5.9b: Annual maize production compared to maize with low aflatoxin

Source: Author computation derived from AgResults Pilot Initiative Data 2017

During the last five years, 33 agricultural enterprises working with close to 50,000 farmers bought and applied 600 MT of Aflasafe. This was used to combat aflatoxin on over 63,000 hectares of maize. They demonstrated the use of this innovation at scale, and as a result, over 214,000 MT of maize grain was produced by the implementers and farmers with aflatoxin content far below the limits set by the US (20 ppb) and the European Union (4 ppb). About 56.4% of this grain was aggregated and sold in the market that made the enterprises/farmers earn nearly US\$1.5 million (net) in premium (avg. 10.7% premium) (Akande et al. 2018).

This implementer support has enhanced the growth of smallholder farmers working under the project who have moved from subsistence farming to production for the market. The harvest advance credit finance mentioned earlier has reduced the side selling that occurs immediately after harvest. Most of the maize, in addition to the agreed quantity is kept until its price is favourable. This change in approach by smallholder farmers is reflected in increases in the aggregation of sales in the formal markets, and a reduction in sales at informal markets that is generally associated with side selling. Aggregation for sales in the formal market increased from 54% in 2013 to 66% in 2017, while sales in the informal market decreased from 38% to 13% in the same period.

The annual quantity aggregated increased exponentially, from an average of 503 MT per implementer in the first year to 3666 MT per implementer in the fifth year. There was, however, a decline in the annual aggregation per implementer in the third year to 586 from 802 MT per implementer in year two (AgResults 2017). The decrease in the third year was primarily associated with a new maize plant disease called Africa Armyworm which was discovered for the first time during the implementation in 2016 (FAO 2018). This disease infested most of the maize farms in Nigeria without any scientific solution at the time. The disease impacted negatively on maize production for some time (All Africa 2017). The fourth year, however, saw an increase to 1633 MT aggregation per implementer (AgResults 2017).

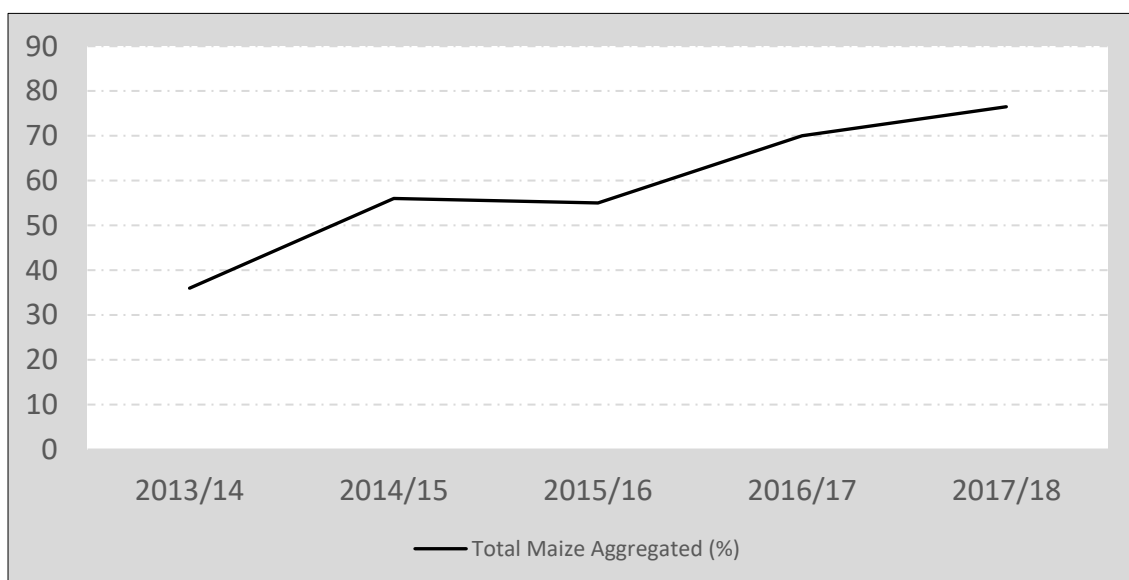


Figure 5.10: AgResults annual maize aggregation

Source: Author Computation derived from AgResults Pilot Initiative 2017 data

The percentage of annual aggregation for the formal market has also grown annually. The yearly data shows that, of the total annual production, the implementer aggregated

approximately 36% in 2014, 56% in 2015, 55% in 2016, and 72% in 2017 of their products for sales in the formal and commercial markets (AgResults 2017). From the second year, the level of aggregation for sale in the informal market was consistently higher than the 50% used as the threshold parameter for the movement of the smallholder farmers from subsistence to production for the market

5.4 The Challenges of the AgResults Pilot Initiative in Nigeria

The AgResults pilot model, however, is not without its challenges. There are several internal and external challenges that impacted on its implementation. Some of these challenges include inconsistency in government policies, inadequate working capital (especially at the early stage of the agribusiness under the project), insufficient rural infrastructures, civil unrest and communal conflicts. The high cost of mechanization and climate change were also factors.

5.4.1 Government Policies

Generally, the Nigerian government has advocated and for some level of commitment to agriculture, and most recently the focus has been on agribusiness as a key driver of agricultural development in Nigeria (Olomola and Nwafor 2017, 21). However, inconsistencies in agricultural policies have a negative impact on the participation of the private sector in the agricultural industry. For example, while the government encouraged the local production of maize, it has also included maize on the list of non-restricted imported agricultural products. The importation of maize has created a glut in the maize market and has discouraged the participation of some smallholder farmers in production in subsequent years.

5.4.2 Inefficient Rural Infrastructure

Most of the rural infrastructures in Nigeria, especially in the southern regions, are dilapidated. The capability of stakeholders to repair or build such infrastructure goes beyond the ability of the implementers because they are high-cost ventures. Key among the dilapidated rural infrastructure are rural access roads, electricity, and rural mobile connectivity. When all these are not in place, the transaction costs are higher, and take more time. More resources are deployed in such cases to achieve a good result (Olukunle 2013).

5.4.3 Inaccessibility of Agricultural Finance

Access to finance beyond subsistence was a significant issue for both the implementers and the farmers before their participation in the AgResults project. One constraint of access to finance by smallholder farmers and agribusiness is the pull mechanism approach. It is hoped this can be overcome through incentives such as performance payments, and through the growth of agribusiness for-profit. Premium payments on sales are also an incentive (Dalberg 2012).

With the exception of the first category of implementers that receive finances from donors or other related projects before AgResults, access to finance in the first year of the implementation was generally a significant constraint for almost all implementers. This was due, in part, to the deficiency in their capability to access funds because of the unstructured and unorganized nature of their business before the intervention. Those that were better organized, however, found financing from the commercial bank to be less useful due to high interest rates.

Due to a reduced level of financing and an ability to scale, the level of input support for smallholder farmers, and aggregation for the market are limited as a result of a lack of harvest buyback and funding, and where side selling is encouraged. There are clear differences in the growth of implementers between the first years when this constraint is experienced, and after they have received premium, incentives, and funding from organizations. The general observation is that, after the second year, most implementers do not have a need for the commercial loan because of the volume of production and sales. The profits from the number of sales and the premium from these sales also reduce the need for loans, as does the incentive received for performance under the push mechanism approach of the AgResults project. It has been observed that aggregation levels increased as the implementers accessed more funds from diverse sources (Tulika et al. 2018).

5.4.4 High Cost of Mechanization

Mechanization is a costly venture, where the implementer cannot access enough funds for their operation. In such cases, mechanization became less important to smallholder farmers. Mechanization, however, could help increase productivity in their business at all levels of production, particularly in the reduction of the postharvest loss.

5.4.5 Side selling by some Smallholder Farmers

Despite the support given by implementers to farmers, some of the farmers under a few implementers are still involved in side-selling their products. Side selling is more prevalent amongst implementers that have a problem with accessing finance to support various inputs. Although some quantity of maize is expected to be sold by farmers directly and informally, where the volume of side selling is high, this affects the profitability of the implementer's business.

5.4.6 Other External Factors

Other external factors include civil unrest and communal clashes, climate change impacts and pests and diseases. There has been much civil unrests in some of the communities where the implementers work. Key amongst these conflicts are herdsmen destroying cultivated farmland. This civil unrest has become a persistent issue in many states in the North Central and the

southern part of Nigeria. Although the Nigerian government has made several pronouncements in curbing these problems, there has, however, not been any major action to back their declaration (Vanguard Newspaper 2017). There have been suggestions to establish private ranching and to enact a ban on open grazing systems to avoid clashes (Daily Post Newspaper 2018).

Since most crop production in Nigeria, like other countries in SSA is low technology-based and rainfed, crops are even more susceptible to the effects of climate change, since their agricultural productivity is primarily dependent on climate variability. Climate change impacts on both crop and livestock production (Ayinde et al. 2011, 189).

Climate change through variation in rainfall patterns in Nigeria affects the annual adoption of projects by farmers in general. Sometimes, there are major issues related to late rainfall in parts of the states where the implementers operate. This is particularly the case in the Southwest and North Central regions of Nigeria, and in some parts of the Northwest region.

Finally, a new plant disease (African Armyworm) attacked most farms in the southern part of Nigeria (FAO 2018). Some of the farmlands where the implementers worked were affected. This disease was first discovered in 2016 and is still undergoing investigations to reach a solution. Although some temporary measures have been adopted in combating this disease, there is ongoing research into solutions by diverse research institutes in SSA.

Overall, this chapter has explored how the AgResults project works with two key groups at the field operational level: directly with agribusiness enterprises referred to as “implementers” under the project and indirectly with smallholder farmers (see Chapter Five for more detail). It also explains how critical structural constraints to agriculture were addressed by the initiative through the Implementers, the limitation of the initiatives and the challenges of the initiative.

The next chapter explores the methodology used in this study in more detail.

Chapter 6: Research Methodology and Design

The previous chapters extensively discussed the role of agribusiness support in market-driven agricultural initiatives to support rural poverty alleviation. However, the knowledge gap that market-driven agriculture could play in supporting smallholder farmers for optimal production, and increased income for poverty alleviation is still limited. This necessitates more significant research and comprehensive intervention.

This research is based on a case study of the AgResults program in supporting the development of agribusiness, market-driven agricultural approaches to support smallholder farmers in Nigeria. Understanding the research requires the adoption of acceptable scholarly approaches in the research findings of a related subject, which entails designing a research methodology that will guide the process of enquiry.

This chapter aims to explain the choices made, and processes followed to fulfil the objectives of the research. It provides a rationale for adopting a multimethod research approach (Webb et al. 1966; Bryman 1992). The multimethod approach identified required some consideration of whether to use qualitative or quantitative methods, and the reasoning is explained in this chapter. It also explains the justification for, and procedure used in the design, collection, and analysis of data. It further provides an understanding of how this research has been informed by various theoretical perspectives while highlighting the researcher's experience in the field.

6.1 Aims and Objectives of the Research

The overarching purpose of this research is to investigate the effectiveness of market-driven agricultural programs in alleviating rural poverty by reviewing the AgResults project in Nigeria. The study seeks to look at both the strengths and weaknesses of agribusiness concerning their impact on rural smallholder farmers. It examines the extent to which agribusiness addresses the structural problems that give rise to impoverishment in the rural areas.

6.2 Research Questions

The study seeks to contribute new knowledge to the research area by examining the role of the private sector in market-driven agriculture. It tests the extent to which new private-sector mechanisms of support for poor rural farmers (as compared to the state-support mechanisms) can alleviate some of the structural causes of poverty in Nigeria.

The three core research questions are:

- To what extent do AgResults implementers, generally known as agricultural enterprises, contribute to an increase in the agricultural income of smallholder farmers

through support in the areas of technical, management, and business in agricultural production?

- How does the change in farmers' income, resulting from agribusiness involvement, impact on the consumption patterns of rural poor smallholder farmers?
- What mechanisms could enhance the contribution of the AgResults implementers to support a change in the income of smallholder farmers to alleviate poverty?

6.3 Theoretical or Conceptual Framework

A theoretical framework illustrates which ideas from the literature review are being investigated. A theoretical framework has been defined "as the system of concepts, assumptions, expectations, beliefs, and theories that support or inform research, that is presented in a visual and written product, that explain either graphically or in narrative form the main things to be studied, the factor, concept and variable, and presumed relationship among them" (Hubberman 1994,18).

Nsamenang (2013, 44) posited that there can be four primary sources for the construction of a conceptual framework:

- The researcher's experiential knowledge: Although traditionally, what a researcher brings from his background and identities in a study could be regarded as bias, this will need to be eliminated from the research. Some scholars have, however noted that it is sometimes difficult to separate one's background and identity from the research, and that if the background and identity are managed well, they may not be construed as bias (Denzin and Lincoln 2000). Mills (1959, 195) noted that successful scholars in the past do not necessarily separate their work from their lives but take both seriously to allow for such disassociation. They seek to use each for the enrichment of the others. Reason (1988, 12), however, used the term "critical subjectivity" to posit a quality of awareness in which we neither suppress our primary experience, nor allow ourselves to be swept away and overwhelmed by it. Instead, we raise our consciousness and use it as part of the inquiry process.
- Existing theories and research: A useful theory gives a framework to make sense of what a researcher sees (Nsamenang 2013, 65). As LeCompte and Preissle (1993, 239) pointed out, theorizing is simply the cognitive process of discovering or manipulating abstract categories and the relationships between these categories. The theory could either be developed along the lines of research or based on traditional work that has been done in the past. Glaser and Strauss (1976, 30) termed "grounded theory", known in qualitative research as theory that is inductively developed during a study, or series of studies with constant interactions with data from the study. The aim

is to generate and develop theory from the data that the researcher collects. In contrast, other theories are developed conceptually, and tested against the empirical data or hypothesis. Both types of theories are valid for the development of the conceptual framework. Nsamenang (2013, 53), however, noted that crucial to a theory in a conceptual framework is the ability of the researcher to balance, and not to underuse or overuse theory, most particularly as it relates to the use of existing theories in qualitative research.

- Pilot work and exploratory research: Good knowledge of prior pilot work and exploratory research could provide a guide for the research design, the choice of methodology, and the modification of theories. Nsamenang (2013, 53) noted that “pilot studies could be designed specifically to test ideas or methods and explore their implications, or to develop grounded theory inductively”.
- A thought experiments.

Consistently, data has shown that poverty is significantly much more a rural phenomenon, and that agriculture, if well designed, can mitigate rural poverty. The general agricultural practices in developing regions that focus more on subsistence smallholder production (Lewis, 1954; Bruntrup and Heidhuess 2002) have not positioned agriculture in its rightful place in rural poverty reduction.

Most of the discussion around the causes of rural poverty are premised on two important divergent theories; the behaviourist and the culturist theories (Lewis 1970, X) or economics / structural theories (Rank 2004 50; Jordan 2004, 24; Bradshaw 2007). Several structural causes of rural poverty have been discussed in Chapter 2 of this thesis, ranging from low returns of labour to urban bias in development (Myrdal 1950; Lipton 1977; Yarun et al. 1997; Bezemer and Headey 2007); access to resources, land, and finance (IFAD 2011, De’Janvry et al. 2001; Stiglitz 1998; Adesina 2010); and constraints over access to market (Taylor et al. 2009).

Some of the earlier mentioned causes of rural poverty, along with other factors have also been identified as bottlenecks to subsistence agricultural practices that limit the ability of rural farmers to optimally participate in the agricultural sector. This limits their income potential and livelihoods. These constraints include high transaction costs (De’ Janvry and Sadoulet 1994, 141; Dorward et al. 2009, 30), a lack of access to input markets, rural access to financing (Green et al. 2016, 5; Olukunle 2013, 40; Taylor et al., 2009), inadequate rural infrastructure (Khan 2000, 23), unfavourable landholding system (FAO 2012; NEPAD 2013, 8), and globalization (Stiglitz, 2002).

There is a strong call for a paradigm shift towards market-driven agriculture as an alternative or substitution for agricultural practices in the developing nations and this is seen as crucial for rural poverty alleviation (Junah 2005, 24; Boateng 2011, 1). However, theoretical and empirical cases of understanding the role of market-driven agriculture in rural development and poverty alleviation are not yet robust. Kumar et al. (2012, 125) noted that there is a need to better understand new approaches to support a shift in paradigm thinking and practices. This is necessary to test the hypothesis of the impact of the market-driven approach on rural poverty based on current production-based approaches.

Both market-driven agriculture, and rural poverty form the key aspects of the conceptual framework for this research (and there is a more elaborate discussion on these two areas in chapters two and four of this thesis).

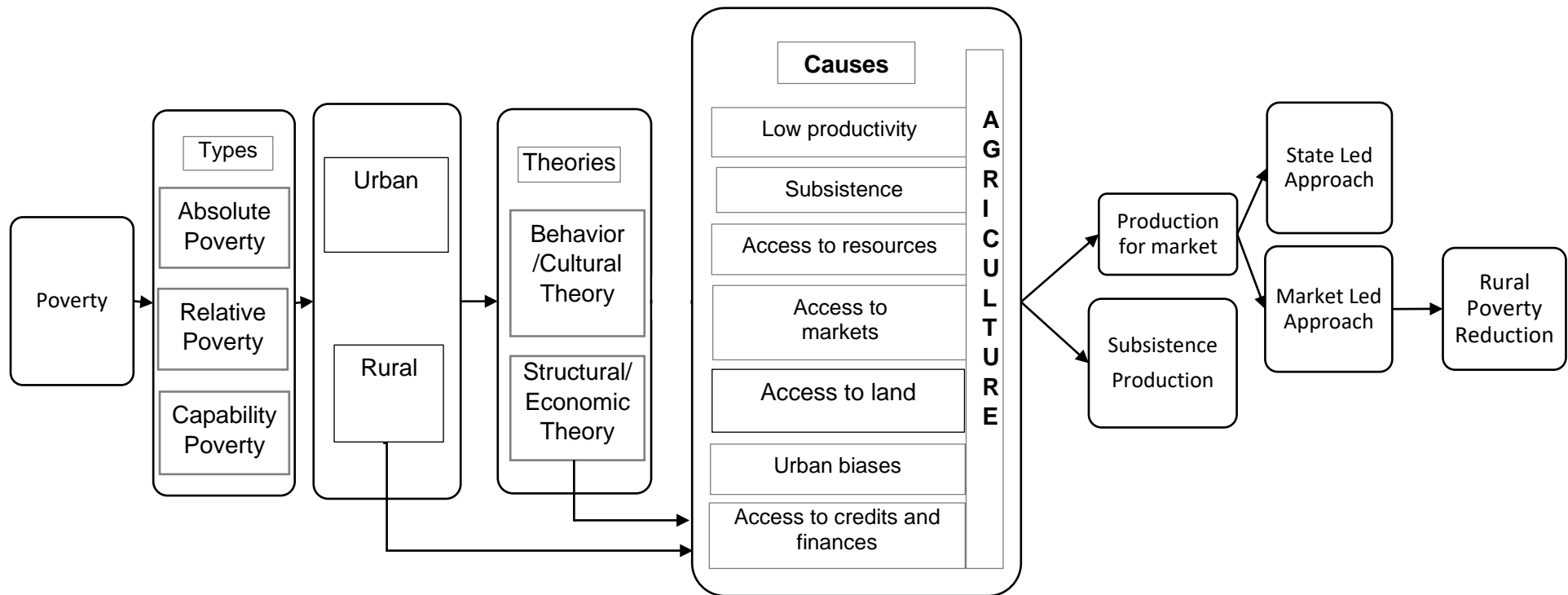


Figure 6.1: A conceptual framework for a market-driven approach to reducing rural poverty.

The relationship between the market-driven approach and rural poverty reduction is illustrated in Figure 6.1. The focus of this research is to examine the role of agribusiness support in market-driven agricultural initiatives, and support to increase productivity and the income of smallholder farmers to alleviate rural poverty. Poverty can be viewed from diverse perspectives as absolute, relative and capability based. Regardless of how poverty is viewed, it exists in both urban and rural areas and the root causes can be categorised as either behavioural/cultural or structural/economical.

The conceptual framework above points out that most rural poverty is associated with structural and economic theories of poverty, and most of structural and economic issues are primarily agrarian in nature and relate strongly to the means of livelihood of the agrarian people who practice smallholding agriculture. Key among the structural causes are low productivity, subsistence agricultural practices, a lack of access to basic resources to work with and a lack of access to markets. They also include a lack of access to farmland, poor credit and finances and urban biases. Over time, it has been postulated that market-driven approaches could be used to overcome many of the structural issues identified above. Through a market driven approach, rural poor smallholder farmers will be able to optimise their production resources, gain access to more resources and also access finances to increase their yield and productivity. In this way they can improve the quality of their products and gain access to premium markets to increase their earnings and escape poverty.

6.4 Data and Methodology (s)

The ability to provide a structured and in-depth research methodology to a considerable extent, will determine the quality of the research outcome. Diverse issues have been identified as rudimentary and cogent for research methodologies, and key among these are an understanding and selection of appropriate research methods for the subject that the researcher is engaged in.

Methodology in the research processes is an all-encompassing system of interrelated practices and thinking that defines the nature of research enquiry (TerreBlanche and Durrheim 1999; Antwi and Hamza 2015, 218).

6.4.1 Methodology

Myers (2009) defined research methods as a strategy of enquiry, which moves from the underlying assumptions of research designs and data collection. Of all the research methods, two strong paradigms of qualitative and quantitative research methods have been the traditional approaches to social scientific research in the past. The method adopted for this research was purposive sampling; a type of sample whereby the researcher selects a sample based on their knowledge about the study and population.

Purposive sampling has been used for many years (Campbell 1955, Godambe 1982). Both qualitative and quantitative sampling methods may be used when samples are chosen

purposively (Campbell 1955), such as participant-observation studies (Walker et al. 2004), ranking activities, questionnaires (Zhen et al. 2006), as well as semi-structured interviews (Anderson 2004, Li et al. 2006, Ramihantaniariyo et al. 2003; Bentley et al., 2004). Statistical analyses such as regression models (Neupane et al. 2002), frequencies, chi-square (Albertin and Nair 2004), analysis of variance (Belcher et al. 2004), univariate analysis and cross tabulation (Bah et al. 2006), among others, have also been used with purposive sampling (Ma Dolores C. Tongc, 2007).

The population sampled for this study comprises of maize farmers that are supported under the AgResults program. This population totalled 104. A further 66 Farmers that were not supported under the AgResults program were sampled for comparison.

The research methods that will be adopted for this study are a combination of survey and semi-structured interview. The fundamental objective of survey design is to describe a situation through the collection of data by asking smallholder farmers in both the treated and control groups questions, both in self-administered questionnaires and through interviews, to obtain relevant facts about the research question raised in Section 4.2 of this chapter.

The study area in the case study consists of three geopolitical regions in Nigeria (Northwest, North Central, and Southwest). There are six geopolitical regions in Nigeria; the AgResults project is being implemented in three of the six geopolitical zones and is expected to expand to all other regions in Nigeria. Although the project spans all three regions, it does not operate in all of the states within each region.

A key limitation of project implementation in these three regions is that respondents from the treated groups had to be selected from a state within the geopolitical region which the project covers, namely; the Northwest, North Central, and the Southwest regions in Nigeria (see Figure 6.2).

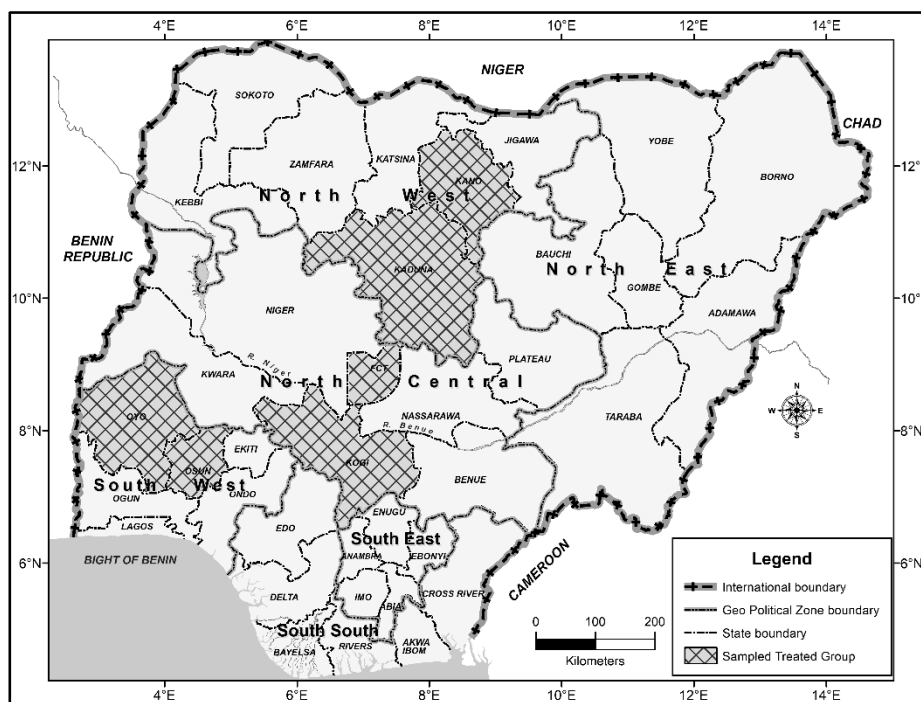


Figure 6.2: Map of Nigeria showing Trated Group sample States

The three regions where the project has been implemented, and where this treated group were chosen from represent three dichotomies of poverty incidences in Nigeria. The Northwest is one of the two regions with the highest poverty rates, while the North Central is one of two regions with mid-range poverty rates. The Southwest is one of two regions with the lowest poverty rates (view detail in the Nigeria poverty disaggregation analysis in Chapter Six).

For accurate impact estimates, the treated and comparison groups had to look similar or balanced. The comparison group was chosen from the same regions with similar geopolitical, demography, farming, cultural, socioeconomic, and agroecological characteristics (ABT Associates, 2017).

The comparison groups were selected from amongst the AgResults project external evaluation comparison groups (see Figure 6.3). The AgResults project external evaluators chose the comparison groups from areas where the project implementation map, obtained through the use of Global Positioning System (GPS) coordinates, showed that project implementation was not taking place. As part of the selection criteria, the external evaluation team also confirmed from farmers and the village heads to further ascertain that they were not included in the project (ABT Associates 2017).

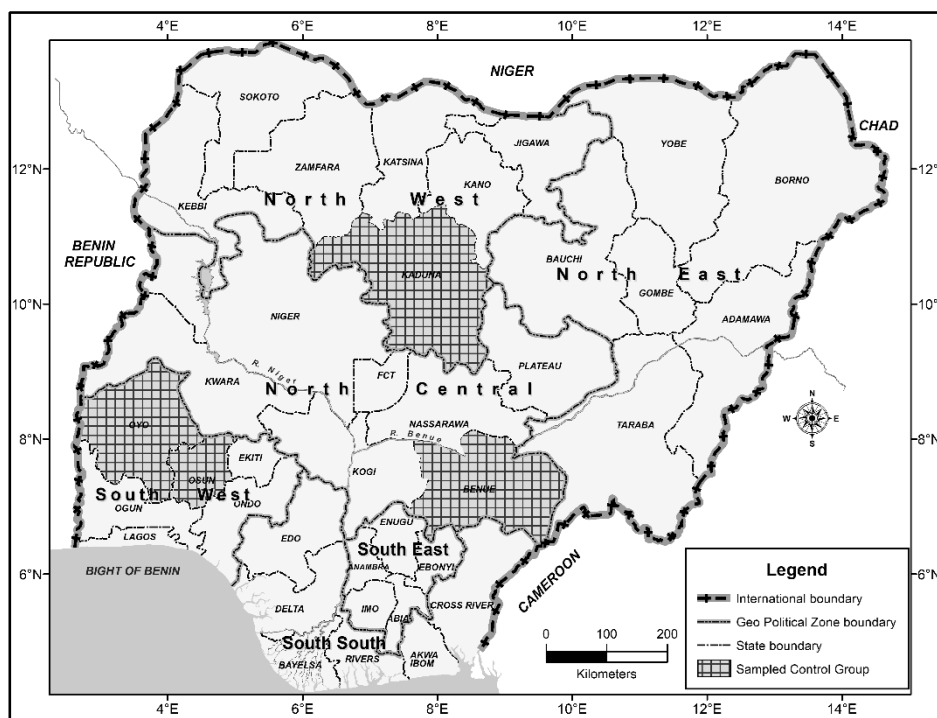


Figure 6.3: Map of Nigeria showing Control Group sample States

Nevertheless, the external evaluator selection of the comparison group villages and farmers were limited to Kastina, Kano, and Kaduna states in the North West region only. This limitation arose because the evaluation was structured on the baseline data collected at the beginning of the project. The AgResults project started out with three states (Kano, Kaduna, and Zamfara states) in the Northwest region in Nigeria. Kastina state was, however chosen in the Northwest as one of the comparison states because of its similar demography with Kano and Kaduna states.

As noted earlier in this chapter, the scope of the study covers more geographical regions beyond the Northwest region. It includes the Southwest and the North Central regions where the project expanded within the past four years of its implementation. Extending the scope of the research to all these regions provides a more robust representation of the participants in the AgResults project. Similar criteria from the external evaluator, as noted above have also been adopted in selecting the comparison group from amongst the two regions of the Southwest and North Central.

6.4.2 Data Sources

Research objectives and theory(s) determine the kind of data methods that were adopted for this research. The research questions informed the type and content of the data that were obtained from the diverse research methods that were utilized in this research. The author used both primary and secondary data sources to gather data for this study.

The primary data sources were obtained through the use of questionnaires and semi-structured interviews with smallholder farmers supported by the AgResults project. The primary data

sources also include smallholder farmers that were not supported by the project, but who had similar characteristics to those that were. This latter population was therefore considered to be a control group.

Secondary data sources comprised reviews of past literature and other findings on subjects similar to this research. Secondary data were sought from several related project reports which included the Project Management Unit (PMU) annual reports, reports from the project's external evaluator, and business reports from the agricultural enterprises also referred to as implementers working under the AgResults project.

6.4.3 Survey

The survey was the quantitative method that was used for this research, and it was based on fixed response options captured via questionnaires (Robson 1993). The assumption highlighted by Leary (1995), that the use of questionnaires in a survey is less expensive and easier to administer in comparison to interview methods may have been over-generalized and not contextualized, the cost-effectiveness of the use of surveys may be relative to the different social, physical, and economic contexts in various regions of the world.

The survey was not applicable, especially in areas or regions where the use of a mailed survey or online electronic system is not available or limited as experienced in this research. The research population in this study came from rural areas with little or no internet connectivity to engage with online or electronic surveys. The research population was also dispersed across different geopolitical regions within Nigeria, and this required a lot of travel because of the physical presence required in administering questionnaires.

Nevertheless, the use of questionnaires in this research created better representation since it focused on a wider audience. It was confidential, with fewer biases since the interpretation of the questionnaires was based on direct responses and there were no researcher inferences of the type that might arise with interviews.

The research population for this study comprised 170 smallholder farmers. Survey data were collected from 104 smallholder farmers that were randomly selected from amongst the farmers working with diverse implementers (agricultural enterprises) under the AgResults Project. Sixty-six smallholder farmers with similar characteristics were also selected for the comparison group.

Random sampling of the total farmers working under the selected implementers in the same year participating in the AgResults project was used for selection purposes. Using random sampling is thought to be a reliable way of eliminating biases in the selection of respondents. Although no single technique guarantees a representative sample, the probability of obtaining a representative sample may be higher with random sampling.

A questionnaire (see Appendix 1) was also used for the survey. The questionnaires required participants to answer questions by choosing from alternatives to reduce the possibility of obtaining vague answers (Scipione 1995).

The questionnaire was divided into sixteen sections. The first section focused on general information about all respondents. Section two focused on the demographic characteristics of the respondents. Sections three to ten focused specifically on the treated group, and the focus of these sections sought to evaluate the different types of support expected to be received by the respondents under the AgResults market-driven approach. It also sought to elicit data on the impact of the support on the respondents' income.

Sections ten to sixteen collected data from the comparison group on their agricultural practices without any project support. It also examined the practices of treated farmers before the intervention.

The survey addressed mostly the first and the second research question, and the survey investigated the types and impact of the support mechanisms provided to agribusiness enterprises under the AgResults project. The aim was to understand the impact on the productivity of poor rural farmers. It also estimated the effects of the support given by the AgResults enterprises on the incomes and consumption of poor and non-poor farmers. The data also gave an indication of the extent to which the support of the agricultural enterprise lifted poor farmers out of poverty.

6.4.4 Semi-Structured Interviews

A semi-structured interview is classified as a qualitative research method in social science. This kind of interview could be based on predetermined, or a set of pre-planned core questions for guidance. These questions could be either a combination of open and closed questions, because of its structured and unstructured features (Bryman 2008). However, the semi-structured interview in this research made use of open-ended questions to draw out in-depth information from respondents.

To support the effectiveness of semi-structured interviews as a research method, this research considered various attributes that needed to be displayed. The characteristics considered include properly structure questions, the communication skills of the interviewers, listening and the ability to probe, creating an environment with ease and convenience of communication for all parties, and strong interpersonal relationship skills. By putting these in place, the researcher can obtain reliable data for their research work (Ritchie and Lewis 2003,141; Clough and Nutbrown 2012,134).

The semi-structured interview, as part of the triangulated research methods adopted in this research, was used to test hypotheses. The researcher interviewed respondents to test the hypothesis that the involvement of smallholder farmers in market-led agricultural approaches

through agribusiness could enhance high productivity and increase income. It also tested if the income generated from agribusiness reduced poverty levels among smallholder farmers.

Different sampling approaches can be adopted, ranging from systematic sampling to random sampling, cluster sampling, quota sampling, and representative sampling (Shona McCombes, 2019; Kassu Jilcha Sileyew, 2019). A representative sample of the total research population was used for the semi-structured interviews for this study. Representative sampling was used to ensure the adequate representation of the overall research population to reflect the elements of the larger population and reduce bias. The sampling technique is also expected to reduce the degree of sampling error in the analysis, and to ensure higher confidence in making statistical inference from the larger group samples.

Twenty-four respondents were interviewed for the semi-structured interviews in this research (See Tables 6.1 and 6.2). Some 15 percent of the total respondents (both the comparison and treated groups) surveyed were selected to take part in semi-structured interviews. The distribution of the 24 respondents was spread across the three geopolitical regions where the survey was conducted. The respondents in the semi-structured interview were distributed across the regions using the same percentage distribution of the respondents from each region in the survey. This procedure helped maintain some consistency in data collection representation without having to be concerned about the data collection method adopted.

Table 6.1: Disaggregation of respondents based on different geopolitical regions in Nigeria (Treated Group).

| Geopolitical region of the respondents | Respondents for the survey: questionnaire (numbers) | Respondents for the semi-structured interview (numbers) | Respondents per region (%) |
|--|---|---|----------------------------|
| North Central | 20 | 3 | 19 |
| Northwest | 64 | 10 | 62 |
| Southwest | 20 | 2 | 19 |
| Total | 104 | 15 | 100 |

Table 6.2: Disaggregation of respondents based on different geopolitical regions in Nigeria (Comparison Group).

| Geopolitical region of the respondents | Respondents for the survey: questionnaire (numbers) | Respondents for the semi-Structured interview (numbers) | Respondents per region (%) |
|--|---|---|----------------------------|
| North Central | 20 | 3 | 30 |
| Northwest | 25 | 3 | 38 |
| South West | 21 | 3 | 32 |
| Total | 66 | 9 | 100 |

Research questions one and two were addressed using survey questionnaire data, while the semi-structured interviews addressed the third research question. These efforts also yielded data that complemented the results of the survey.

Field accounts collected using semi-structured interviews were categorized into three areas, the essential characteristics of the respondents, information on knowledge, and information on behaviour. These were considered relevant in order to elicit reliable data to fulfil the aim and objectives of the study (Newing 2011).

By using questionnaires and interviews using the survey method, it was possible to generate an explanation regarding the nature of the relationship that exists between agribusiness enterprises and rural poverty. The potential areas of investigation included the impact of the assistance given by the agribusiness enterprise under the AgResults project on the productivity of poor rural farmers. It also assessed the effects of the support provided by AgResults enterprises on the income and consumption of poor and non-poor farmers, checking the extent to which support for agricultural enterprise lifted poor farmers out of poverty.

Other areas of investigation included an evaluation of the type of support mechanisms (e.g., technical assistance, credit, inputs, and marketing) that seem to have a greater impact on improved outcomes. The research also sought to find out if other structural or technological support mechanisms potentially help poor farmers to increase their output but are not currently being provided by the AgResults project.

6.4.5 Participants

As earlier noted, the participants were selected from amongst the smallholder farmers working under the AgResult project, and some farmers that were not participating in the project. Smallholder farmers are defined as farmers with landholdings of no more than 5 hectares, that were not ordinarily able to produce surpluses before the AgResults intervention. They also had to have land and labour that could contribute to the implementation of their agribusiness (AgResults 2012).

6.5 Data Collection

Data collection was carried out to establish whether the outcome of the research was achieved. Primary data were collected from smallholder farmers using questionnaires and semi-structured interviews.

A pilot survey was carried out on 10 participants in order to evaluate the feasibility, duration, cost, and adverse events of the survey, and to improve upon the study design prior to full-scale research work. During the pilot survey, it was observed that no single question adequately captured the farmers' "Non-farm income before and after intervention". This led to the introduction of two new questions: 15c in Part A and 76c in Part D in the questionnaire.

A consent form was designed for the respondents to fill in. The majority of respondents were literate in English and could understand the content of the consent form. The few illiterate respondents that took part were helped by a family or community member, or leader that was literate in English. These assistants were able to translate the consent form. The consent form elicited permission from respondents and agreement to the use of the information they disclosed for the purposes of this research only.

A DBA administration plan (tracker) was developed in June 2016 showing the number of questionnaires to be administered per region, state, and implementer. It was updated where necessary to capture the changes that were made periodically. The questionnaire was administered over seven months between August 2016 and February 2017. A data entry template was developed using a spreadsheet. The questionnaires were first reviewed to ensure data accuracy and consistency before there were entered into the spreadsheets. An Excel spreadsheet was developed for the two categories of the comparison and treated groups. All data were reviewed again to ensure consistency across the different categories.

The coding of data was carried out before migration to IBM Statistical Package for the Social Sciences (SPSS) for analysis. The coding process involved the cleaning of data and efforts to ensure the consistency of units and the presentation of variables, as well as the accuracy of the inputted converted variables. The first analysis was carried out in April 2017, using SPSS for analysis. By May 2017, the first set of results from the SPSS data analysis were ready.

The next stage involved data presentation. Descriptive statistics including means, frequencies, and percentage distributions were employed in data presentation. Cross-tabulation was also employed. Descriptive analyses such as means were employed to cater for continuous data years in farming, household size, and some other variables in the same category. Frequency distribution, on the other hand, was employed to describe the respondents in the study. Cross-tabulation was an important tool that was used to identify the relationship between two or more variables presented in a single table.

A template was developed to collate the results that were extrapolated from the overall results of the analysis to form a set of results based on different combinations that directly responded to the research questions. Further analysis of the results from the SPSS analysis collated was carried out in January 2018. This involved developing charts and graphs, which showed trends in different regions as they related to the research questions. A further review was also carried out to streamline the results based on states within geographical regions.

As earlier mentioned, 24 semi-structured interviews were also designed to further capture information from a percentage of the respondents in the survey in an open-ended manner. A recorder was used for interviews; and the interview was conducted between November and December 2017. A transcription of all the recorded interviews lasted for approximately one and a half months, with one full transcription lasting almost 12 hours. All transcriptions were reviewed

against the responses recorded to remove ambiguity and clarify uncertainty. Both the recording of the interviews and questionnaires were archived on a hard drive.

6.6 Data Analysis

Data analysis began with the categorization and organization of data in search of patterns, critical themes, and meanings (Strauss and Corbin, 1990).

Bodgan and Bilken (2007) define qualitative data analysis as working with the data, organizing them, breaking them into manageable units, coding them, synthesizing them, and searching for patterns. Brennan (2014) noted that triangulation can be used in data analysis by using a set of results to corroborate another type of data. The survey was analyzed using quantitative data analysis, while the semi-structured interviews were analyzed using qualitative data analysis approach.

Quantitative data analysis used descriptive statistics such as means, frequencies, and percentage distributions. Cross-tabulations were also employed. Descriptive analysis such as means provided measures of continuous data years in farming, household size, and some other variables in the same category. Frequency distribution, on the other hand, was used to describe the respondents in terms of demographics and other observations. Regression analysis was adopted to estimate the relationships between dependents, and one or more critical independent variables of interest to the overall research questions. The aim was to measure the impact of interventions on smallholder farmers by the agribusiness enterprise under the AgResults initiative. Analysis also looked at how this intervention impacted on productivity and income levels, and how income impacted on the consumption patterns of the smallholder farmers.

In terms of the semi-structured interviews, a high proportion of qualitative data was unstructured and consisted of verbatim transcriptions of interview discussions. The researchers “provided some coherence and structure to the unstructured data set while retaining hold of the original accounts and the observation it was derived from” (Hubberman and Miles 2002, 310).

Thematic analysis (Evans 2018) was used to identify patterns within the data through a process of transcribing, reading, analyzing, and interpreting semi-structured interviews without losing focus on the overarching research questions. Although some of the themes such as , marketing , support , inputs and credits given to smallholder farmers frequently appeared on the dataset, this did not diminish the importance of the other themes across the datasets, and each theme was treated with importance (Braun and Clarke 2006).

6.7 Validity and Reliability

The credibility of research data is strongly dependent on its objectivity, reliability, and validity. These three aspects are measured through a scientific and experimental study which is mostly quantitative in nature. However, this is not the same as qualitative research since it is not based

on standardized instruments, and this creates complexity in the assessment of its accuracy. Merriam (1998, 199) noted that the constructs of reliability and validity are quantitative and positivist in nature, and not necessarily applicable to qualitative research.

A pilot survey tool place with 10 participants, in order to evaluate feasibility, duration, cost, and adverse events, and to improve upon the study prior to full-scale research work.

6.8 Ethical Implications

Ethical guidelines have been strictly adhered to as set out by the University of Hertfordshire's Ethics Committee. Advice and approval were sought from the Committee for this research. This study has also been reviewed and approved by the University of Hertfordshire's Ethics Committee.

Semi-structured interviews and surveys could be intrusive because they allow individuals to declare feelings which are private. To a considerable extent, successful research relies on the interpersonal skills of the interviewer (Newton 2010). Participation in the research was voluntary, and every respondent was given a participant information sheet ahead of the survey. The information sheet was part of the University of Hertfordshire's Ethics Committee requirements that relate to the study of a human being. In the context of ethical approaches, any individual below the age of 20 years was not eligible to participate.

The responses were anonymous, and all data collected were kept confidential. Information from the research was locked in a separate location with restricted access. Information that contained identifiers, e.g., names and addresses were removed from the survey instruments containing data after collecting information from the study participants. Data were kept in a secured form on a hard drive with password protection and encryption. Hard copies were kept in a secured cabinet in the researcher's private library. Data were not used or shared beyond the specific purposes of the research outlined in the participant information form. It was made clear that any further use would require permission from the participants.

As earlier discussed, this research was based on a mixed methodology combining both quantitative and qualitative methods. Since qualitative research acknowledges the researcher's subjectivity, this approach required the researcher (who is also a practitioner) to manage the AgResults project in Nigeria, and to also research the subject related to this project. The aim was to identify and make explicit the biases, motivations, interests, or perspectives of the inquirer (Lincoln and Guba 1985, 290).

Although there may be perceived possible conflicts and personal bias with objectivity in the research because of both roles (project manager and researcher), the project is, however, a pilot, and the core of the project is to learn an approach that works under the principles of a pull mechanism. Pull mechanism unlike the push mechanism is led by the learning approach, and practices that are focused on a defined goal, rather than a specific path to the goal (Scherer

and Yago 2011). The role of the project manager in the push mechanism is not to define a goal, but to identify and outline available opportunities, without any preference for strategies and techniques involved in achieving the results or goal. The project manager's relationship is also directly limited to the implementers, and the data that are collected for this study came from smallholder farmers working under the implementers. The farmers themselves are a group that the project manager does not have a relationship with and thus cannot influence their activities, practices, and decision.

Finally, the outcome of the project is determined by several stakeholders. The stakeholders include in-country advisory council members that are generally senior government officials. These are stakeholders in agriculture and trade in Nigeria. The project donor selects the advisory council team before the implementation of the project in-country, and the project manager provides scrutinized quarterly progress reports to them. There is also an independent global external evaluator for the project that collects independent data annually. The project secretariat reviews the project manager's compliance with the implementation process (AgResults 2018).

With the methodology clarified and the data now defined, the subsequent chapters focuses on the primary data collected by the researcher, the data analysis. It uses the outcome of the analysed data to specifically evaluate the implementation of the initiative and review its efficacy in supporting market-driven agricultural practices and poverty alleviation.

Chapter 7: Examining the Impacts of AgResults on Smallholder Income and Yield

7.1 Introduction

This research seeks to contribute knowledge and understanding to the core research issues by (i) examining the effectiveness of a particular market-based development program of agribusiness and (ii) examining the extent to which private sector-managed initiatives in market-driven agriculture alleviate the structural problems of agriculture thereby contributing to poverty reduction. It tests the extent to which the new private-sector mechanism of support for poor rural farmers could support an increase in agricultural productivity, income, and diversification in food consumption in Nigeria.

This chapter therefore focuses on the impact of the AgResults model on smallholder farmers. It offers an analysis of the primary data collected and it presents the findings arising from the analysis. The key features of the data collected are described using basic descriptive statistics (mean and measures of frequency). The research methodology adopted for data collection and analysis in this thesis was discussed in detail in Chapter Four.

Some outcomes of the AgResults project have been measured through the project implementation monitoring data (AgResults 2018) and external evaluators reviews (Narayan et al. 2019). The project and evaluation level results focused primarily on the implementers (the agribusiness enterprise). It is expected that combining the outcome of this study at the smallholder level with the results from the project implementation unit (discussed in detail in Chapter Five) will create a robust body of knowledge and a holistic view of the effects of the AgResults Initiative.

A few peculiar issues occurred during project implementation and data collection for this study, one of which was a new plant disease (African Armyworm) discovered in Nigeria in 2016. This was same year when the primary data for the study were collected. The disease infested maize farms in Nigeria (FAO 2016) and, currently, most countries in Africa have instances of the disease. Another was the persistent attacks of herdsmen on farmlands which impacted negatively on maize yield in Nigeria in general and this might have resulted in the lower yield experienced with the treated group during the intervention when compared with before the intervention. Nevertheless, an average maize yield of 3 MT/ha over the five years of the project implementation was also recorded by farmers under the project (Narayan et al. 2019), almost 50% higher than the national maize average of 1.68 MT/ha within the same period (FAOSTAT 2016).

This chapter examines the impacts of the AgResults project on the income and yield of smallholders, and it is structured as follows:

Section 7.1 introduces the chapter, and section 7.2 focuses on the identification of the necessary variables for econometric estimation.

Section 7.3 examines equations and data for the research to meet the main objective. The main objective was to examine the impact of the AgResults intervention on the output (yield) and income of rural smallholder farmers. Section 7.4 presents the results of the data analysis and section 7.5 presents a discussion of results from the various methods of data analytical models employed. Section 7.6 discusses the implications of the findings, and the originality of the research.

7.2 Identifying the Variables for Estimation

In this study, the researcher measured the impact of the participation of the smallholder farmers in the agribusiness project by investigating how yield from their crop production and income from the sales of their crops altered after implementers provided them with support.

The reviewing the literature on agriculture income and its determinants suggested that increasing the income of farmers is critical to reducing rural poverty in developing regions (see Chapters 2, 3 and 5). Evidence from the literature shows that growth emanating from the agricultural sector has been two to four times more effective in reducing poverty than GDP for activity originating outside of agriculture (Alston and Pardey 2014).

The income of farmers could be derived from both on-farm and off-farm activities. Income from both activities could support an increase in production or the productivity of smallholder farmers. On-farm production is a particularly important income source in SSA. At the national level, (Taylor et al. 2009), between 40 and 70 percent of rural households earn more than three-quarters of their income from on-farm sources, compared to other regions where livelihoods are more diversified. In Asia, between 10 and 50 percent earn more than three-quarters of their income from on-farm sources, while in Latin America, only 10 to 20 percent earn income from that source (IFAD 2011, 54). Wang et al. (2011) pointed out that where non-farm income has also become strong among smallholder households, it has not necessarily translated to more financing for farming activities. The effect of such income on-farm activities will mostly be positive when such income, or a significant part of it is channelled precisely towards farm activities. Byerlee (2012) posited that, generally, a rise in off-farm income might influence increases in land sizes for agricultural purposes.

The growth of the income for smallholder farmers has been linked with diverse factors, such as improvements in the quality of the farm commodity produced and increases in the yield and the quantity of the overall production of smallholding cultivation (Gollin et al. 2014, IFPRI 2015).

Achieving a high yield or productivity is, however determined by access to several primary agricultural factors such as access to credit, and the farm size (Doward et al. 2009 and Olukunle 2013). Other variables include the number of years in school, and memberships of the farm-based organization (Onogwu et al. 2017). Some additional factors that have been underscored as necessary to maize yield include the quality and type of seeds, and the timely and adequate use of fertilizer, chemicals, and labour (Kazim 2014; World Bank 2014, 1; Green et al. 2015).

Most agricultural factors mentioned earlier, especially farm size, labour input, fertilizer, and the quality of the planting materials (Obasi et al. 2013) are however interdependently required for yield increases and agricultural productivity. They need to be combined for efficient outcomes in any agricultural production.

Where these agricultural factors are available, access to them, knowledge about them, skills for their effective utilization, and resources for purchasing some of the inputs may require support that may can either come through government or private sector interventions (Porter and Kramer 2006; Philip et al. 2019; Nelson 2011). Advanced knowledge and skillsets as to the effective utilization of agricultural factors also requires linkages between the knowledge base and the smallholder farmers. These roles were played in the past traditionally by the government through extension support services. However, extension services have proved to be grossly inadequate in the developing regions in general, and in Nigeria in particular. It is estimated that there is only one extension worker for every 25,000 smallholder farmers in Nigeria, compared to the best practices of one extension officer to between 500 and 1,000 farmers (Abduquadri and Mohamed 2012, 537).

Where this extension is present, their level of knowledge in modern agribusiness is limited, with a stronger focus on the technical aspects of agriculture, and limited knowledge and attention on the agriculture business and management. Also relevant here are the technical aspects that form the core of the agribusiness. Some of these roles are now being taking over by the private sector, as shown in the AgResults Initiative (see Chapter 6 for more details). The private sector role in providing access to agricultural production and offering support in accessing skills and knowledge through training and input financing is also measured in this research based on the collective support received.

The data analysis for this research occurred in stages. During the first stage, descriptive analysis and crosstabulation were conducted. At certain points, a mixture of the two (descriptive and cross-tabulation) were performed to show the relationship between the control group, the treated group (before the intervention and after intervention), and other variables like the socio-demographic characteristics of respondents, access to production inputs (labour use pattern), access to inputs and finance, agricultural productivity and income, and consumption.

During the second stage, econometric analysis was conducted to compare and understand the impact of the intervention in the two critical areas, namely, yield and farm income. Data were classified into three groups: data for farms before the intervention, data for farms after the intervention, and data for farms that have not benefited from the project which were used as a separate control group.

The regression equation to explain the impact on farm yield (dependent variable) included the following variables: total non-farm income, cultivated land size, the quantity of fertilizer used, and maize variety planted. To test the impact of the project, several variables were used. One

was a dummy variable (D) that took the value of 1 for farms after being included in the project. The value of 0 represents being part of the project. The other is another dummy variable that took the value of 1 for farms after they were included in the project, and 0 for farms that were never part of the project (i.e., control farmers).

7.2.1 Justification of the Variables for Econometric Estimation

D1 or D2 stands for dummy variable, which takes the value of 0 and 1. Dummy variables measure the impact of AgResults intervention programs on yield after harvest, or income from farm activities. Non-farm income is income from the non-farming activities of the farmers. This has a great impact on the yield obtained after harvest, in addition to income from farming activities. Funds are essential for agriculture, and without money or credit, farmers cannot cultivate a meaningful size of land. Spending starts with land clearing, and the procurement of farm inputs and also involves hiring labourers. Therefore, income from non-farming activities has helped smallholder farmers to succeed. The relationship between yield and non-farm income is therefore positive (Adelekan and Omotayo, 2017).

Another independent variable is the area of land planted (ha). Ordinarily, the more land cultivated, the larger the farm produce, all things being equal. However, experience has shown that other factors like natural disasters, and climate change as well as plant diseases like armyworm (FAO, 2018) can destroy maize plantations. This in turn can reduce the yield obtained after harvest, even when more land is cultivated. Others have argued that it is not just the size of the land that matters, but also how optimally the land is utilized (Yu et al, 2019).

Labour input is a measure of the impact of the number of staff working on the farm, and the yield obtained after harvest is another key metric. While some use hired labour, others use family labour who work fewer hours on the farmland. This allows the farmer to obtain a decent yield from the farm, and in the long run reduces the amount of money accrued by the farmer. Other independent variables that also affect farm income include the household size. A large family size implies that more family labour will be available for farm activities (Ozor and Cynthia, 2010).

The kind of support received by smallholder farmers may determine whether practices continue to be subsistence in nature or not. Support such as extension service and training (Berthe 2015), provision of seed, herbicides inputs, and fertilizer (Green et al 2016), tractor services (Kormawa 2015), finance or input finance (Olukunle 2013) storage and transportation (AGRA 2012) has been identified in the literature as some of the important determinant of farmers remaining to be subsistence or engage in a market driven agriculture. Quantity and timely Fertilizer application plays a significant role in terms of the quantity of yield obtained after harvest (Geetha, and Srivastava, 2019). Some farmers plant ordinary seed while others plant high breed seed.

7.3 Equation and Data

The econometric analysis seeks to examine the impact of the AgResults implementer's intervention on the change in output (yield) and the income of rural smallholder farmers. Linear regression using ordinary least square (OLS) was adopted as the method of estimation for this analysis with the following equation:

$$Y_t = \alpha + \beta Z_t + \epsilon_t$$

Where Y is the dependent variable, α is the coefficient of the constant term, and Z is a matrix of a series of relevant explanatory variables. β captures the impact of the explanatory variables. ϵ is the error term.

$$\text{Impact on Yield} = \alpha + \beta_1 D_{it} + \beta_2 Fz_{it} + \beta_3 Ha_{it} + \beta_4 Mv_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it} + \epsilon$$

$$\text{Impact on Income} = \alpha + \beta_1 D_{it} + \beta_2 Y_{it} + \beta_3 Hs_{it} + \beta_4 Sfg_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it} + \epsilon$$

Three equations were adopted for the econometric estimation of this research in order to test the impact of the AgResults initiative on yield productivity as well as on the incomes of smallholder rural farmers.

Equation 1 makes use of pooled data (Baltagi 2008) with a time dimension of two years (before and after intervention), and a cross-sectional dimension of multiple variables of the type described earlier. The dummy variable in this model tests the impact of being part of the project, or receiving support via the project.

Equation 2 makes use of cross-sectional data and estimates the impact of selected independent variables on the yield obtained after harvest and taking account of total household farm income for the farms in the control group, and for farms after the intervention.

Equation 3 makes use of time series data and estimates the impact of some explanatory variables on the yield obtained after harvest, and the total household farm income for the intervention group alone. All the equations use similar explanatory variables, except Equation 3 that has scorecard in place of the dummy variable.

Table 7.1. Selected variables

| Abbreviation | Variables | Description of variable |
|------------------------|-----------------------|---|
| Y | Dependent variable | Yield obtained after harvest (MT) |
| I | Dependent variable | Total farm income (Naira) |
| α | - | Intercept |
| β_1 to β_7 | - | Estimated regression coefficients |
| | Independent variables | |
| D1 | Dummy variable 1 | Before intervention 0, After intervention 1 |

| | | |
|-----|-----------------------------|--|
| D2 | Dummy variable 2 | Control 0, After intervention 1 |
| NFI | Total non-farm income | Naira |
| Ha | Area of land planted (ha) | Hectare |
| Fz | Quantity of fertilizer used | Kg |
| Mv | Maize variety planted | Grains/Improved seed |
| Li | Labour input | Number of workers |
| Hs | Household size | Number of people |
| Sfg | Sales at the farm gate | Yes 1, No 0 |
| SC | Scorecard | Number of supports received from implementer |

Where i denotes farm 1, t is the year before and after the intervention. Y is the yield obtained after harvest, α is the coefficient of the constant term, and β is the coefficient of the independent variables. D is the dummy variable for farms before, and after the intervention. Fz is the quantity of fertilizer used (kg), Ha is the area planted, Mv is the maize variety, NFI is the total non-farm income, Li is the labour used, and I is income. α is the coefficient of the constant term. Hs pertains to household size, and Sfg is sales at the farm gate. SC (scorecard) records the numbers of support each farmer receives from the implementer.

The scorecard represents the type of support the farmer receives from the implementer. In terms of the support received, eight of the most crucial forms of support that have been identified in the literature were received from implementers by smallholder farmers under the AgResults initiative. These includes training, seeds, herbicides, insecticide, fertilizer, tractor services, finance, and a warehouse. The dummy variable within the explanatory variables tests if there is a significant positive or negative change after the intervention. These were treated as multiple responses. If a farmer received full supports this translates to a score of 8. If he receives less support this impacts commensurately on the score. This is called the scorecard and is based on continuous data.

Primary data are mainly used to execute the study. Data were obtained through the use of structured questionnaires administered to randomly selected smallholder farmers in both the control and treated groups in the Northwest, North Central, and Southwest regions of Nigeria. The data collected include: the area of land planted (ha), household size, total farm income, total non-farm income, maize variety planted, the quantity of fertilizer used, labour used, sales at the farm gate, the scorecard figure, and the yield obtained after harvest.

The area of land planted (ha) is the total size of land cultivated with maize by each farmer surveyed. This is measured in hectares. Household size is the total number of members of the household in the sample. Total farm income is the proceeds received from the sales of farm produce (i.e. maize). The total, non-farm income is the proceeds received from non-farm related activities. These are all continuous data.

The dummy variable is a variable generated to measure the impact of being included in the AgResults initiative and receiving various forms of support from the implementers. The dummy variable in equation 1 takes the value of 0 for farms before the intervention, and 1 after the intervention. In equation 2, the dummy variable takes the value of 1 for the treated farms (farms after the intervention) and 0 for untreated farms (that were never part of the project, i.e., the control group).

The maize variety planted refers to the type of maize seed planted on the farm. There are two types of maize variety, improved seed and local grain. Improved seed is a product of modern plant breeding and a crucial basic input in agriculture utilized for improved crop yield, disease, pest, and parasitic weed resistance. Its use critically addresses the dual challenges of food insecurity and climate change. Local grains comprise kernels harvested from plants after maturity and utilized predominantly as food to provide nourishment, although they could be planted as seed but are not necessarily targeted to improve crop yield, or disease, pest, and parasitic weed resistance. A seed is purely used for propagation and is targeted towards improved crop quality and quantity, whereas the grain is purely used for consumption and could be a product of the seed or a local cultivar (Ajeigbe et al. 2010; Mohammed et al. 2010).

The local grain is represented as 0, while the improved seed is represented as 1. The quantity of fertilizer used is the quantity of fertilizer used by the farmer surveyed. It is measured in kilograms (kg).

Labour input is the variable that describes the number of workers in relation to their type: either family labour or higher labour used for on-farm production activities such as land preparation, planting, weeding, fertilizer application, harvesting, threshing, winnowing, and bagging.

Sales at the farm gate are the variable that test whether or not the farmers surveyed sold part of their farm produce at the farm gate before aggregation. The variable representation of the sales at the farm gate is 1, and 0 when the farmer does not make sales at the farm gate. The yield obtained after harvest is the total quantity of maize obtained after harvest. It is measured in metric tonnes.

The scorecard is a variable that indicates the support that the farmers received from their agribusiness enterprise (implementer) such as training, seeds, herbicides, insecticide, fertilizer, tractor services, finance, and warehouse. The variable is based on continuous data.

7.4 Results and Analysis

7.4.1 Characteristics of Farmers and Farms

Figures 7.1a–d. presents the demographic characteristics of respondents, while Tables 7.2 to 7.7 represent agricultural productivity, access to production inputs (labour use pattern, access to inputs and finance), percentage changes in income, and the consumption pattern of

respondents separately. Tables 7.8 and 7.9 present the results of regression analysis for yield obtained after harvest and total household farm income.

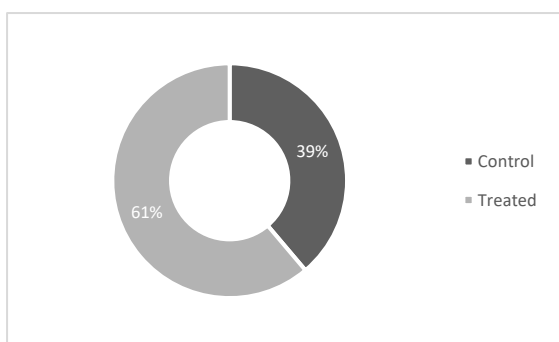


Figure 7.1a: Number of respondents (%)

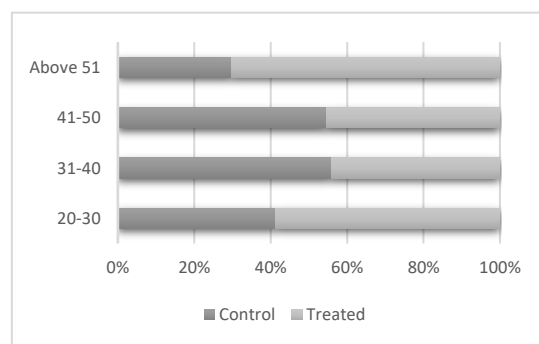


Figure 7.1b: Age distribution

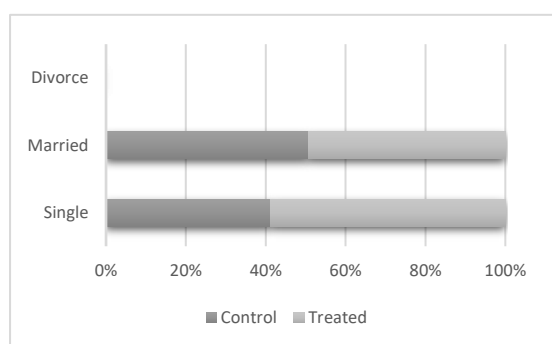


Figure 7.1c: Marital status (%)

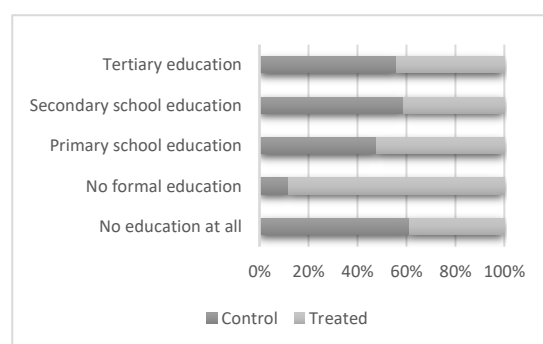


Figure 7.1d: Education level (%)

Figure 7.1b shows that farmers between the ages of 31 and 50 years dominated both the control and the treated groups. Farmers between these age ranges constituted some 81.5% of the control group and 65.2% of the treated group. Figure 7.1d shows that 89.4% of the respondents under the control group and 73.1% under the treated group had some form of education. There was a high percentage within the treated group with no formal education (22%) compared to the control group of 3%. This implies that the majority (78.0%) of the farmers in the treated group had one form of formal educational or the other. All things being equal, farmers with basic education are better equipped to make more informed decisions (Opara, 2010). In the same vein, education has been identified as one of the factors that can contribute to agricultural productivity (Adenuga et al., 2013). The majority of the farmers in both groups were married: 93.9% and 91.3% of the respondents for both the control and treated groups, respectively (see Figure 7.1c).

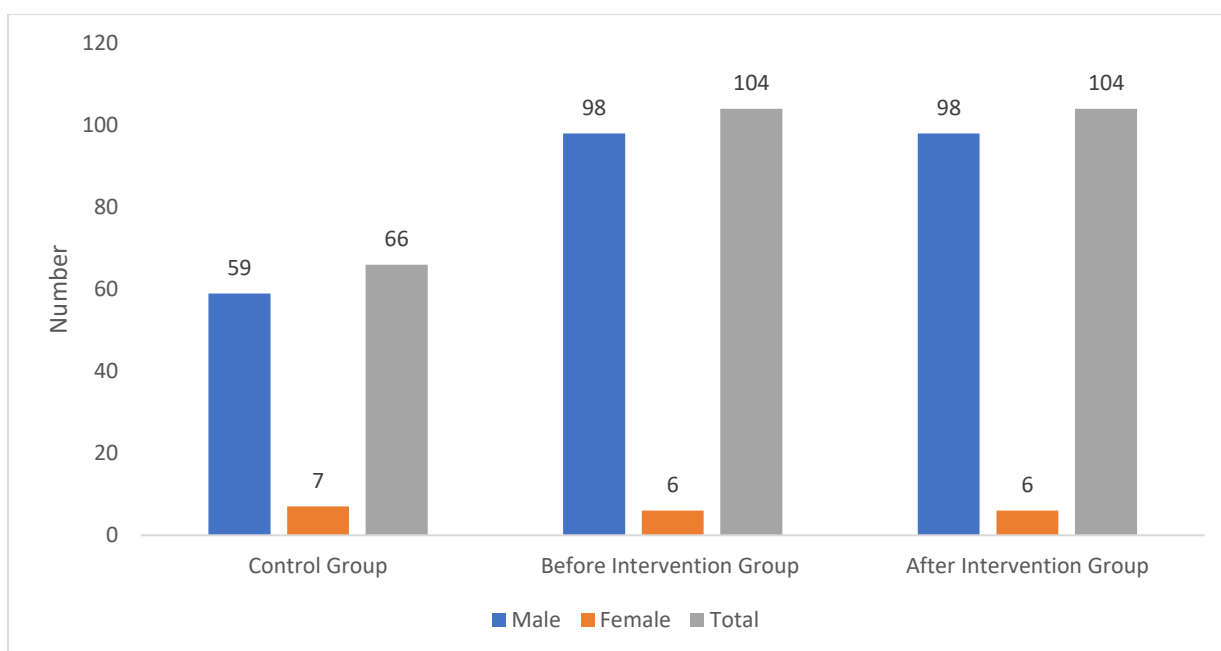


Figure 7.2: Number of respondents (male and female) sampled for the study

Figure 7.2 present number of respondents (males and females) sampled for the study across all the groups. The treated group further divided into two of equal number for easy comparison. The numbers are the same for all the tables except for econometric where samples needs to be adjusted for proper estimation.

7.4.2 Contribution of Agribusiness Enterprises in increasing Smallholder Farmers' Agricultural Income through Support in the Agricultural Production

Table 7.2a: Proportion of farmers in receipt of support from implementers (%)

| Support | Yes | No | Total |
|------------------|------|------|-------|
| Training | 85.0 | 15.0 | 100.0 |
| Improved seeds | 73.3 | 26.7 | 100.0 |
| Fertilizer | 60.1 | 39.9 | 100.0 |
| Herbicides | 59.7 | 40.3 | 100.0 |
| Insecticides | 9.7 | 90.3 | 100.0 |
| Tractor services | 30.5 | 69.5 | 100.0 |
| Financing | 8.1 | 91.9 | 100.0 |
| Warehouse | 22.8 | 77.2 | 100.0 |

Table 7.2a shows that 85% of the total respondents in the treated group received training from the implementers. Training is one of the critical components of agricultural extension which supports knowledge, and the ability of the smallholder farmers to adopt Good Agronomic Practices (GAP) that are essential to produce quality products and enhance higher yield (source). 10 out of 15 respondents mentioned that the implementer helped them with training,

while 5 did not comment. Wad Fam 3 said “issues of how we used to plant before have been addressed through the training”. Another farmer TG Fam 1 said “I received training on management, proper fertilizer application and other modern planting techniques”. These are examples of what positive impact of implementers in the life of selected smallholder farmers in the study. The majority of the respondents in the treated group accessed inputs from the implementer comprising of improved seeds (73.2%), fertilizer (60.1%), and herbicides (59.7%).

**Table 7.2b: Proportion of farmers in receipt of support from implementers
Disaggregated by Gender and Geopolitical Zone (%)**

| Support | Gender | | | Geopolitical Zone | | | |
|------------------|--------|--------|-------|-------------------|------------|------------|-------|
| | Male | Female | Total | North Central | North West | South West | Total |
| Training | 93.7 | 6.3 | 100.0 | 16.8 | 67.4 | 15.8 | 100.0 |
| Improved Seeds | 94.3 | 5.7 | 100.0 | 18.2 | 72.7 | 9.1 | 100.0 |
| Fertilizer | 94.9 | 5.1 | 100.0 | 16.7 | 78.2 | 5.1 | 100.0 |
| Herbicide | 96.0 | 4.0 | 100.0 | 17.3 | 76.0 | 6.7 | 100.0 |
| Insecticide | 83.3 | 16.7 | 100.0 | 25.0 | 75.0 | 0.0 | 100.0 |
| Tractor services | 94.7 | 5.3 | 100.0 | 13.6 | 15.3 | 71.1 | 100.0 |
| Finance | 88.9 | 11.1 | 100.0 | 11.1 | 66.7 | 22.2 | 100.0 |
| Warehouse | 87.5 | 12.5 | 100.0 | 12.5 | 62.5 | 25.0 | 100.0 |

Gender

The analysis of access to support presented in Table 7.2b both disaggregated by gender and geopolitical zone. Only respondents in treated, after intervention have access these support. According to the table, about 96.0% male respondents received herbicide while those who received fertilizer account for 94.9%, for those that received tractor support account for 94.7% of the total population. Another set of male respondents (93.7%) claimed that implementer trained them, while 94.3% received seeds. The highest support female received from implementer is insecticide (16.7%), about 12.5% and 11.1% received warehouse and finance from implementer respectively.

Geopolitical Zone

In North Central, insecticide is the highest support respondents received from implementer. Those that received improved seeds account for 18.2% of the population sampled compared with North West and South West where the highest support received is fertilizer (78.2%) and tractor (63.2%) respectively. Tractor as highest support received from implementer in South West could be due to high number of cultivated maize land in the region.

Table 7.3a: Access to production inputs (labour use pattern, access to inputs, and finance) (%)

| Labour use pattern | Control | | | | | Treated (BI) | | | | | Treated (AI) | | | | |
|------------------------|---------|------|------|-----|-------|--------------|------|------|-----|-------|--------------|------|------|-----|-------|
| | F | H | F&H | OL | Total | F | H | F&H | OL | Total | F | H | F&H | OL | Total |
| Land preparation | 7.1 | 92.9 | 0.0 | 0.0 | 100.0 | n/a | n/a | n/a | n/a | n/a | 7.8 | 92.2 | 0.0 | 0.0 | 100.0 |
| Planting | 12.1 | 63.6 | 24.3 | 0.0 | 100.0 | 25.1 | 56.7 | 18.2 | 0.0 | 100.0 | 20.6 | 61.8 | 14.7 | 2.9 | 100.0 |
| Weeding | 7.6 | 68.2 | 24.2 | 0.0 | 100.0 | 23.8 | 61.4 | 14.8 | 0.0 | 100.0 | 24.5 | 58.8 | 12.7 | 4.0 | 100.0 |
| Fertilizer application | 21.8 | 47.3 | 30.9 | 0.0 | 100.0 | 37.2 | 39.4 | 23.4 | 0.0 | 100.0 | 47.1 | 23.1 | 29.8 | 0.0 | 100.0 |
| Harvesting | 7.6 | 72.7 | 19.7 | 0.0 | 100.0 | 2.4 | 83.3 | 14.3 | 0.0 | 100.0 | 12.2 | 77.6 | 10.2 | 0.0 | 100.0 |
| Threshing | 17.6 | 51.0 | 31.4 | 0.0 | 100.0 | 29.9 | 60.8 | 9.3 | 0.0 | 100.0 | 13.5 | 74.0 | 12.5 | 0.0 | 100.0 |
| Winnowing/ bagging | 35.0 | 45.0 | 20.0 | 0.0 | 100.0 | 62.2 | 37.8 | 0.0 | 0.0 | 100.0 | 2.8 | 68.6 | 28.6 | 0.0 | 100.0 |

| Access to inputs | Control | | | | Treated (BI) | | | | Treated (AI) | | | |
|------------------|---------|-------|-----|--|--------------|-------|-----|--|--------------|-------|-------|--|
| | S | H | Fz | | S | H | Fz | | S | H | Fz | |
| Company | 24.2 | 0.0 | n/a | | 21.1 | 1.5 | n/a | | 11.5 | 0.0 | 0.0 | |
| Open market | 1.6 | 97.0 | n/a | | 5.8 | 88.0 | n/a | | 2.9 | 23.7 | 19.5 | |
| Neighbor | 0.0 | 1.5 | n/a | | 1.0 | 1.5 | n/a | | 0.0 | 0.0 | 0.0 | |
| Implementer | 0.0 | 0.0 | n/a | | 0.0 | 0.0 | n/a | | 76.9 | 76.3 | 80.5 | |
| Self | 74.2 | 1.5 | n/a | | 27.9 | 0.0 | n/a | | 8.7 | 0.0 | 0.0 | |
| Others | 0.0 | 0.0 | n/a | | 44.2 | 9.0 | n/a | | 0.0 | 0.0 | 0.0 | |
| Total | 100.0 | 100.0 | n/a | | 100.0 | 100.0 | n/a | | 100.0 | 100.0 | 100.0 | |

| Access to finance and credit | Control | | | | | Treated (BI) | | | | | Treated (AI) | | | | |
|------------------------------|---------|-----|-----|-----|-------|--------------|-----|-----|-----|-------|--------------|-----|------|-----|-------|
| | P | L | I | Oc | Total | P | L | I | Oc | Total | P | L | I | Oc | Total |
| Fertilizer | 92.3 | 7.7 | 0.0 | 0.0 | 100.0 | 92.5 | 3.8 | 0.0 | 3.7 | 100.0 | 77.0 | 0.0 | 19.5 | 3.5 | 100.0 |
| Harvesting | 98.0 | 2.0 | 0.0 | 0.0 | 100.0 | 95.5 | 4.5 | 0.0 | 0.0 | 100.0 | 92.9 | 0.0 | 5.1 | 2.0 | 100.0 |
| Threshing | 98.0 | 2.0 | 0.0 | 0.0 | 100.0 | 96.9 | 1.0 | 0.0 | 2.1 | 100.0 | 68.8 | 0.0 | 28.1 | 3.1 | 100.0 |
| Winnowing & bagging | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 95.8 | 1.4 | 0.0 | 2.8 | 100.0 | 91.4 | 0.0 | 8.6 | 0.0 | 100.0 |
| Purchase of bags | 98.4 | 1.6 | 0.0 | 0.0 | 100.0 | 93.6 | 3.2 | 0.0 | 3.2 | 100.0 | 76.8 | 0.0 | 20.7 | 2.5 | 100.0 |
| Transport - Farm to Home | 98.0 | 2.0 | 0.0 | 0.0 | 100.0 | 92.6 | 3.2 | 0.0 | 4.2 | 100.0 | 92.4 | 0.0 | 7.6 | 0.0 | 100.0 |

Abbreviations: F; H; OL denote family, hired, and other labour, respectively. S, H, and Fz denote seeds, herbicides, and fertilizer. P, L, I and Oc stand for funds from personal sources, loans, implementers and others, respectively.

Table 7.3a shows that, in the control group, from pre-planting to harvest, on average, 63% of labour was hired labour whilst 16% was family labour. A further 22% was a combination of both hired and family labour. However, in the treated group, 65% of labour was hired, whilst 18% was family labour, and 16% was a combination of both hired and family labour.

In addition, 77%, 76%, and 81% of the farmers under the treated group accessed seed, herbicides, and fertilizers, respectively, through the implementer, while 74% under the control group used grains stored from the previous harvest. In addition, 97% sourced their herbicides from the open market, and none accessed fertilizer through other means. The result of the indepth interview bostress the points above 13 out of 15 respondents interviewed mentioned that they accessed. Agb Fam 1 explained that *“all the chemicals and other things are provided if you don’t have money”* another one Wad Fam 2 said *“I receive support for all the inputs I need to start the season”*. According to TG Fam 2 when asked whether he has access to input he said *“yes, some they give me for free (Seeds) I also get fertilizer, herbicides”*, in the same vain AHN Fam 1 *“we get a certain percentage of inputs (seeds and Fertilizer)”*. Another set of farmers BG Fam 1 explained that *“I received a lot inputs to improve my farming”* and BG Fam 5 *“I receive quality seeds and other inputs including Aflasafe”*.

Table 7.3a shows that for 97.5% of the control group, funding came from personal finances, while 2.6% came from a loan. For the treated group, 83.2% were funded through personal finance. However, 14.9% of direct finance came through the implementers. The result of semi-structured interview revealed that out of 15 respondents interviewed 10 of them mentioned that they received training from implementers. A good example is AHN Fam 1, he explained that *“I receive money from the implementer which I used in harvesting my maize”*. Another farmer TG Fam 3 mentioned that *“I used to ask for loan and they give me and I pay later”*, another farmer BG Fam 2 also got loan from implementer this is what he said *“they give us harvest advance, and after they remove their loan”*.

Table 7.3b: Access to production inputs (labour use pattern, access to inputs, and finance) by Gender (%)

| | Gender | Control | | | | | Before Intervention | | | | | After Intervention | | | | |
|-----------------------------|--------|---------|-----|-----|-----|-------|---------------------|------|-----|------|-------|--------------------|-----|------|------|-------|
| | | P | L | I | Oc | Total | P | L | I | Oc | Total | P | L | I | Oc | Total |
| Fertilizer | Male | 91.3 | 8.7 | 0.0 | 0.0 | 100.0 | 93.4 | 6.6 | 0.0 | 0.0 | 100.0 | 79.3 | 0.0 | 20.7 | 0.0 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 75.0 | 25.0 | 0.0 | 0.0 | 100.0 | 40.0 | 0.0 | 60.0 | 0.0 | 100.0 |
| Harvesting | Male | 97.8 | 2.2 | 0.0 | 0.0 | 100.0 | 95.2 | 4.8 | 0.0 | 0.0 | 100.0 | 94.6 | 0.0 | 4.3 | 1.1 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 66.6 | 0.0 | 16.7 | 16.7 | 100.0 |
| Threshing | Male | 97.9 | 2.1 | 0.0 | 0.0 | 100.0 | 97.8 | 2.2 | 0.0 | 0.0 | 100.0 | 70.0 | 0.0 | 28.7 | 1.3 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 80.0 | 0.0 | 0.0 | 20.0 | 100.0 | 50.0 | 0.0 | 50.0 | 0.0 | 100.0 |
| Winnowing and Bagging | Male | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 97.2 | 2.8 | 0.0 | 0.0 | 100.0 | 93.9 | 0.0 | 6.1 | 0.0 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 66.7 | 33.3 | 0.0 | 0.0 | 100.0 | 50.0 | 0.0 | 50.0 | 0.0 | 100.0 |
| Purchase of bags | Male | 98.2 | 1.8 | 0.0 | 0.0 | 100.0 | 94.3 | 5.7 | 0.0 | 0.0 | 100.0 | 76.9 | 0.0 | 21.8 | 1.3 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 83.3 | 16.7 | 0.0 | 0.0 | 100.0 | 75.0 | 0.0 | 25.0 | 0.0 | 100.0 |
| Transport – Farm to Home | Male | 97.8 | 2.2 | 0.0 | 0.0 | 100.0 | 94.4 | 5.6 | 0.0 | 0.0 | 100.0 | 92.3 | 0.0 | 7.7 | 0.0 | 100.0 |
| | Female | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 66.7 | 33.3 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |

P– Personal, L – Loan, I – Implementer, Oc - Others

Table 7.3c: Access to production inputs (labour use pattern, access to inputs, and finance) by Geopolitical (%)

| | North Central | | | | | | | | | | | | | | |
|-------------------------------|---------------|------|-----|-----|-------|-------------------------------|------|-----|------|-------|------------------------------|-----|------|-----|-------|
| | Control | | | | | Treated (Before Intervention) | | | | | Treated (After Intervention) | | | | |
| | P | L | I | Oc | Total | P | L | I | Oc | Total | P | L | I | Oc | Total |
| Fertilizer | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 81.8 | 18.2 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| Harvesting | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 93.3 | 6.7 | 0.0 | 0.0 | 100.0 | 70.6 | 0.0 | 29.4 | 0.0 | 100.0 |
| Threshing | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 88.9 | 0.0 | 0.0 | 11.1 | 100.0 | 68.8 | 0.0 | 31.2 | 0.0 | 100.0 |
| Winnowing and Bagging | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 88.2 | 0.0 | 0.0 | 11.8 | 100.0 | 75.0 | 0.0 | 25.0 | 0.0 | 100.0 |
| Purchase of bags | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 88.9 | 11.1 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| Transport - from farm to home | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 87.5 | 12.5 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| | North West | | | | | | | | | | | | | | |
| | Control | | | | | Treated (Before Intervention) | | | | | Treated (After Intervention) | | | | |
| | P | L | I | Oc | Total | P | L | I | Oc | Total | P | L | I | Oc | Total |
| Fertilizer | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 93.4 | 1.6 | 0.0 | 5.0 | 100.0 | 75.0 | 0.0 | 25.0 | 0.0 | 100.0 |
| Harvesting | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 98.2 | 1.8 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| Threshing | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 66.7 | 0.0 | 33.3 | 0.0 | 100.0 |
| Winnowing and Bagging | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 93.1 | 0.0 | 6.9 | 0.0 | 100.0 |
| Purchase of bags | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 71.2 | 0.0 | 27.1 | 1.7 | 100.0 |
| Transport - from farm to home | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 93.9 | 0.0 | 6.1 | 0.0 | 100.0 |
| | South West | | | | | | | | | | | | | | |
| | Control | | | | | Treated (Before Intervention) | | | | | Treated (After Intervention) | | | | |
| | P | L | I | Oc | Total | P | L | I | Oc | Total | P | L | I | Oc | Total |
| Fertilizer | 77.8 | 22.2 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 50.0 | 0.0 | 50.0 | 0.0 | 100.0 |
| Harvesting | 94.7 | 5.3 | 0.0 | 0.0 | 100.0 | 88.9 | 11.1 | 0.0 | 0.0 | 100.0 | 88.9 | 0.0 | 11.1 | 0.0 | 100.0 |
| Threshing | 95.2 | 4.8 | 0.0 | 0.0 | 100.0 | 94.7 | 5.3 | 0.0 | 0.0 | 100.0 | 75.0 | 0.0 | 20.0 | 5.0 | 100.0 |
| Winnowing and Bagging | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 | 87.5 | 12.5 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| Purchase of bags | 94.7 | 5.3 | 0.0 | 0.0 | 100.0 | 75.0 | 6.3 | 0.0 | 18.7 | 100.0 | 83.3 | 0.0 | 16.7 | 0.0 | 100.0 |
| Transport - from farm to home | 94.1 | 5.9 | 0.0 | 0.0 | 100.0 | 70.6 | 5.9 | 0.0 | 23.5 | 100.0 | 81.8 | 0.0 | 18.2 | 0.0 | 100.0 |

P – Personal, L – Loan, I – Implementer, Oc - Others

Gender

Tables 7.3b and 7.3c present information about respondents' access to finance and credit disaggregated into gender and geopolitical zones. All respondents both gender provides finance and credit themselves in control and treated (before intervention) groups for fertilizer, herbicide, threshing, winnowing/bagging as well as purchase of bag and provide for transport from farm to home. The result of data analysis further shows similar trend in treated (after intervention), about 60.0% claimed that implementer provide finance and credit for them to purchase fertilizer. Another set about 50% opined that implementer finance their threshing while another 50% claimed implementer provides finance and credit for them for winnowing/bagging. The table further revealed that, implementer favoured female than their male counterpart.

Geopolitical Zones

Table 7.3c shows that in North West under control group, all respondent provide money for their farm activities. Under treated (before intervention) group, majority of respondents finance their farming activities though, another set about 18.8% respondents use loan to finance fertilizer, 12.5% used loan to finance transport. Another 11.1% respondents claimed loan is the source of finance for purchase of bags.

Respondents in after intervention group claimed that they finance farm activities themselves, 31.3% claimed that implementer finance their threshing, 25.0% said implementer finance winnowing/bagging while 17.6% said implementer finance the harvesting.

All respondents in North Central under control group finance their farming activities compare to control group in South West where about 22.2% obtain loan to finance their farm activities. Other activities which respondents used loan to finance are transport (5.9%), harvesting (5.3%), purchase of bag (5.3%) and threshing (4.8%) all remaining respondents used personal fund to finance their farming activities.

Like respondents in control group, all the farm activities in North West under treated (before intervention) finance with personal fund except little proportion 1.8% (harvesting) and 1.6% (fertilizer) claimed that they used loan to finance the farming activities.

All respondents in South West (before intervention) claimed they used personal fund to finance fertilizer, 94.7% finance threshing with personal fund while remaining used loan. In the same vein, 87.5% finance winnowing/bagging with personal fund and the rest 12.5% used loan. The respondents in treated (after intervention) group which did not use their personal fund to finance farming activities rather implementer helped them in all the three regions sampled for the study. Table further revealed that implementer provide finance and credit facilities for respondents in

North West for the following activities: threshing (33.3%), purchase of bag (27.1) and fertilizer (25.0%), the rest used their personal fund.

In South West, all respondents claimed that they finance winnowing/bagging with personal fund. Fertilizer was finance by personal fund (50.0%) and implementer (50.0%). Implementer finance threshing (20%), transport (18.2%) and purchase of bags (16.7%). About 11.1% respondents claimed implementer finance their harvesting in the region.

Table 7.4a: Land and agricultural productivity

| | Control | Treated before intervention | Treated after intervention |
|--|----------------|------------------------------------|-----------------------------------|
| Agricultural productivity | | | |
| Avg. area of maize land cultivated (ha) | 3.61 | 3.32 | 4.49 |
| Average sales price per kg (NGN) | 106.37 | 71.26 | 109.47 |
| Avg. yield obtained after harvest (kg) | 10,313.64 | 9422.45 | 10 784.14 |
| Value of total harvest [avg. yield * avg. sales price] (NGN) | 1,097,062 | 671,444 | 1,180,540 |
| Avg. yield obtained after harvest (kg) per hectare | 2857 | 2838 | 2402 |
| Value of total harvest [avg. yield*avg. sales price] (NGN) per hectare | 303,895.29 | 202,242.17 | 262,926.50 |

Table 7.4a shows that respondents in the treated, after intervention group cultivated slightly more maize land (4.49 ha per farmer) compared to respondents in the control group (3.6 ha per farmer). They spent less on the cost of production on the cultivated areas, compared to before the intervention. This could be due to the support received from the implementer, which cushioned the overall costs of cultivation. All implementer contributions to the cost of production of each farmer were deducted from all the harvested crops before payment to get the value of the total harvest.

Similarly, there was an increase in the yield of the treated group after intervention overall, and per hectare compared to the control group. Increased access to inputs such as improved seeds, herbicides, and fertilizers as well as training on GAP, proper fertilizer application, and the adoption of some other modern planting techniques for optimal production adopted by the implementer may have contributed to the increase in yield obtained after harvest. There was an 8% increase in the value of the total harvest between the control and treated group after the intervention.

The better price received by the smallholder farmers is based on a combination of several factors, which include improvement in the yield, the quality of the maize, and the volume of aggregation. Before the intervention, farmers mostly sold individually, with a low volume while under the intervention, the implementers aggregated higher volumes of the maize from several farmers to facilitate reliable bargaining power at a higher price from high-end users of the produce. In addition, the implementers' marketing strategy targeted high-end maize buyers, and the adoption of a demand-driven approach, rather than a supply-driven approach. In the past, the latter approach had limited the ability of smallholder farmers to meet the specific requirements of high-end buyers, such as the required type of maize (white or yellow maize) , the moisture content, and quality in relation to the aflatoxin level in the crops produced. These variables also contributed to increases to the value of the total harvested crops (Table 7.4a).

Table 7.4b: Land and agricultural productivity by Gender

| | Control | | Treated (Before Intervention) | | Treated (After Intervention) | |
|--|--------------|------------|-------------------------------|-----------|------------------------------|------------|
| | Male | Female | Male | Female | Male | Female |
| Average area of maize land cultivated (Ha) | 3.8 | 2.3 | 3.4 | 1.4 | 4.7 | 1.7 |
| Average sales price per kg | 107.5 | 127.5 | 75.2 | 78.6 | 115 | 115.5 |
| Average yield obtained after harvest (kg) | 10,842.40 | 5,857.10 | 9,957.10 | 1,225.00 | 11,340.30 | 2,163.30 |
| Vale of total harvest | 1,165,558.00 | 746,780.25 | 748,773.92 | 96,285.00 | 1,304,134.50 | 249,861.15 |
| Average yield obtained after harvest (kg)/Ha | 2,853 | 2,547 | 2,929 | 875 | 2,413 | 1,273 |
| Value of average yield obtained per ha | 306,725.79 | 324,687.07 | 220,227.62 | 68,775.00 | 277,475.43 | 146,977.15 |

Table 7.4c: Land and agricultural productivity by Geopolitical

| | Control | | |
|--|--------------------------------------|--------------|--------------|
| | NC | NW | SW |
| Average area of maize land cultivated (Ha) | 1.5 | 4.2 | 4.9 |
| Average sales price per kg | 156.6 | 79.1 | 37.3 |
| Average yield obtained after harvest (kg) | 1,555.00 | 17,328.00 | 13,624.00 |
| Vale of total harvest | 243,513.00 | 1,370,644.80 | 508,175.20 |
| Average yield obtained after harvest (kg)/Ha | 1,037 | 4,126 | 2,780 |
| Value of average yield obtained per ha | 162,342.00 | 326,344.00 | 103,709.22 |
| | Treated (Before Intervention) | | |
| | NC | NW | SW |
| Average area of maize land cultivated (Ha) | 2.3 | 2.9 | 5.6 |
| Average sales price per kg | 105.6 | 62.2 | 92.1 |
| Average yield obtained after harvest (kg) | 3,111.10 | 9,060.80 | 16,187.90 |
| Vale of total harvest | 328,532.16 | 563,581.76 | 1,490,905.59 |
| Average yield obtained after harvest (kg)/Ha | 1,353 | 3,124 | 2,891 |
| Value of average yield obtained per ha | 142,840.07 | 194,338.54 | 266,233.14 |
| | Treated (After Intervention) | | |
| | NC | NW | SW |
| Average area of maize land cultivated (Ha) | 1.7 | 2.9 | 12.4 |
| Average sales price per kg | 177.5 | 107.7 | 125.8 |
| Average yield obtained after harvest (kg) | 1,971.90 | 9,717.50 | 21,194.00 |
| Vale of total harvest | 350,012.25 | 1,046,574.75 | 2,666,205.20 |
| Average yield obtained after harvest (kg)/Ha | 1,160 | 3,351 | 1,709 |
| Value of average yield obtained per ha | 205,889.56 | 360,887.84 | 215,016.55 |

NC – North Central, NW – North West, SW – South West,

Gender

All male respondents cultivated more maize land than their female counterpart did. Another notable information from the table is that female in control group cultivated more maize land (2.3ha) than female in treated after intervention (1.7ha). In general average yield obtained from the female gender farm is lower when compare to their male counterparts.

Geopolitical Zone

Respondents in the treated, after intervention group cultivated more maize land than South West (12.4ha/farmer) compare to respondent in control group (4.9ha/farmer). This could be due to support received (tractor) from implementer. However, this is not so in North West as respondents in control group cultivated more maize land (4.2ha/farmer) than their counterpart in after intervention group (2.9ha/farmer). The yield after the intervention is also generally lower after the intervention compare to before the intervention in all the region, with the exception on the North-west that have a slightly higher yield during the intervention. The major decline in productivity took place in the south-west, this may be due in part to the occurrence of the fall

army worm that first emerged from the region in Nigeria in 2016 and ravaged most of the farms under the Agresults project (CGIAR 2019)

7.4.3 Mechanisms that enhance and sustain the contribution of the AgResults Implementers to support a long-term change in Income of Smallholder Farmers for Poverty Alleviation

Some of the mechanisms put in place by the AgResults implementers are presented in Table 7.2a. The table illustrates that about 85% of the respondents in the treated group opined that they received training from the implementers. Training is one of the critical components of agricultural extension which supports knowledge and the ability of the smallholder farmers to adopt good agronomic practices (GAP) that are essential to produce quality products and enhance higher yield (source). A larger proportion of respondents in the treated group accessed inputs from the implementer such as improved seeds (73.3%), fertilizer (60.1%), and herbicides (59.7%) (see Table 7.2a for details). The support provided by the implementers from pre-planting to harvest improved the yield obtained after harvest and increased the income of the smallholder farmers (see Tables 7.2a).

7.4.3.1 Poverty Line Estimation

The national poverty line provided by Nigeria National Bureau of statistics was used in this estimation. Therefore, where a farmer earned below the poverty line (NGN per year) s/he will be considered as poor, not poor if they earned above this level. Inflation rates were considered before arriving at the poverty line each year. For instance, in year 2009-2010 the poverty line was ₦55,235, and the same poverty line was applicable in 2010-2011. This was adjusted with an inflation rate of 10.8% in 2010-11 to arrive at ₦61,200; the poverty line for that period. In year 2011-2012, the inflation rate dropped from 10.8% to 8.48%. This drop in the inflation rate was also considered to arrive at the poverty line during that period. Table 6.5 gives details of the inflation rate for each year, as well as an updated poverty line after adjusting for inflation.

Table 7.5: Poverty Live Estimation (NGN per year)

| year | Poverty Line Multi (NGN per year) | Inflation rate | Updated Poverty lines (NGN per year) | Code |
|---------|-----------------------------------|----------------|--------------------------------------|------|
| 2009-10 | 55,235 (baseline) | - | 55,235 | P10 |
| 2010-11 | = P10 * (1+0.108) = P11 | 0.108 | 61,200 | P11 |
| 2011-12 | = P 11 (1+0.122) = P12 | 0.122 | 68,666 | P12 |
| 2012-13 | = P12 * (1+0.0848) = P13 | 0.0848 | 74,490 | P13 |
| 2013-14 | = P13 * (1+0.081) = P14 | 0.081 | 80,494 | P14 |
| 2014-15 | = P14*(1+0.09) = P15 | 0.090 | 87,738 | P15 |
| 2015-16 | = P15*(1+0.157) = P16 | 0.157 | 101,513 | P16 |
| 2016-17 | = P16*(1+0.165) = P17 | 0.165 | 118,263 | P17 |
| 2017-18 | = P17*(1+0.121) = P18 | 0.121 | 132,572 | P18 |

Source: www.statista.com/statistics/383132/inflation-rate-in-nigeria/

7.4.3.2 Individual Farmers Poverty Level and Assessment

Table 7.6: Incidence of Poverty among the Group (%)

| Income Group | Control Group | | Before Intervention Group | | After Intervention Group | |
|-----------------|---------------|----------|---------------------------|----------|--------------------------|----------|
| | Poor | Non-Poor | Poor | Non-Poor | Poor | Non-Poor |
| Farm Income | 27.3 | 72.7 | 34.0 | 66.0 | 20.8 | 79.2 |
| Non-Farm Income | 38.2 | 61.8 | 23.0 | 77.0 | 30.2 | 69.8 |
| Overall Income | 5.5 | 94.5 | 1.9 | 98.1 | 7.5 | 92.5 |

Table 7.6 presents the incidence of poverty amongst the group of farmers sampled for the study. In the control group, about 61.8% were non-poor, while the remaining 38.2% were poor based on their non-farm income. About 72.7% and 27.3% are non-poor and poor respectively based on farm income as a yardstick. When the two incomes are combined (to overall income) close to 95% of the population were non-poor while the remaining 5.0% were poor.

About 77% were non-poor farmers, while 23% were poor, taking non-farm income into consideration in the 'before intervention' group. In terms of farm income, 66% were non-poor, while 34% were poor. In the 'after intervention' group, using non-farm income, some 69.8% were non-poor, and the remaining 30.2% were poor farmers. 79.2% and 20.8% were non-poor and poor farmers based on their farm income.

In all, the result of the analysis reveal that the AgResult program has lifted some farmers under the study above the poverty level/line. From Table 7.6, the proportion of poor farmers under the control group is 27.3%, and this grew to 34.0% in the 'before intervention' group. This reduced to 20.8% in the 'after intervention' group.

There was a sharp reduction in the proportion of non-poor farmers overall income under the after intervention group. The table reveals that the reduction in the proportion of non-poor farmers under after intervention group was due to reductions in the non-farm income of the farmers. Thus, it can be concluded that non-farm income plays a major role in the overall income of the farmers (see Table 7.6 and Figure 7.2). It also shows that more people are in poverty after intervention because total income (combination of farm and non-farm incomes) were reduce due to drastic reduction in the non-farm income . A reflection of overconcentration on farming activities.

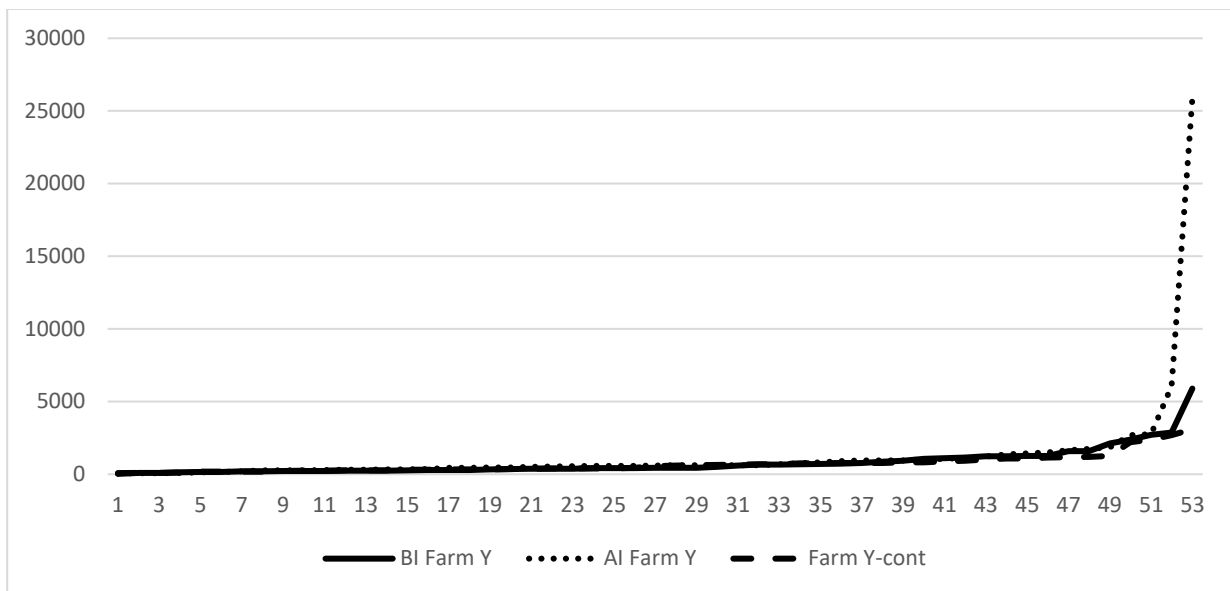


Figure 7.3a: Distribution of Overall Incomes, All Households

Source: Author's Calculation

Figure 7.3a presents the distribution of the overall income of all households in the study. The graphs show income distribution patterns are overshadowed by two outlier farm incomes, hence it is not possible to see the relative status of income in different groups, this was adjusted for in Figure 7.3b by eliminating the two outliers' incomes.

Further, the result of the individual poverty level assessment amongst households using all income (the addition of farm income and non-farm income) shows that about 9.4% earn above ₦2 million in the 'before intervention' group, compared to the after intervention group with 7.6%. Households that earn above ₦2 million in the control group account for 10.9% of the total sample.

The reduction in the proportion of those earning below ₦2 million in the after intervention group might be due to the AgResults program that occupied most of their time in engaging in non-farm activities that yielded additional income.

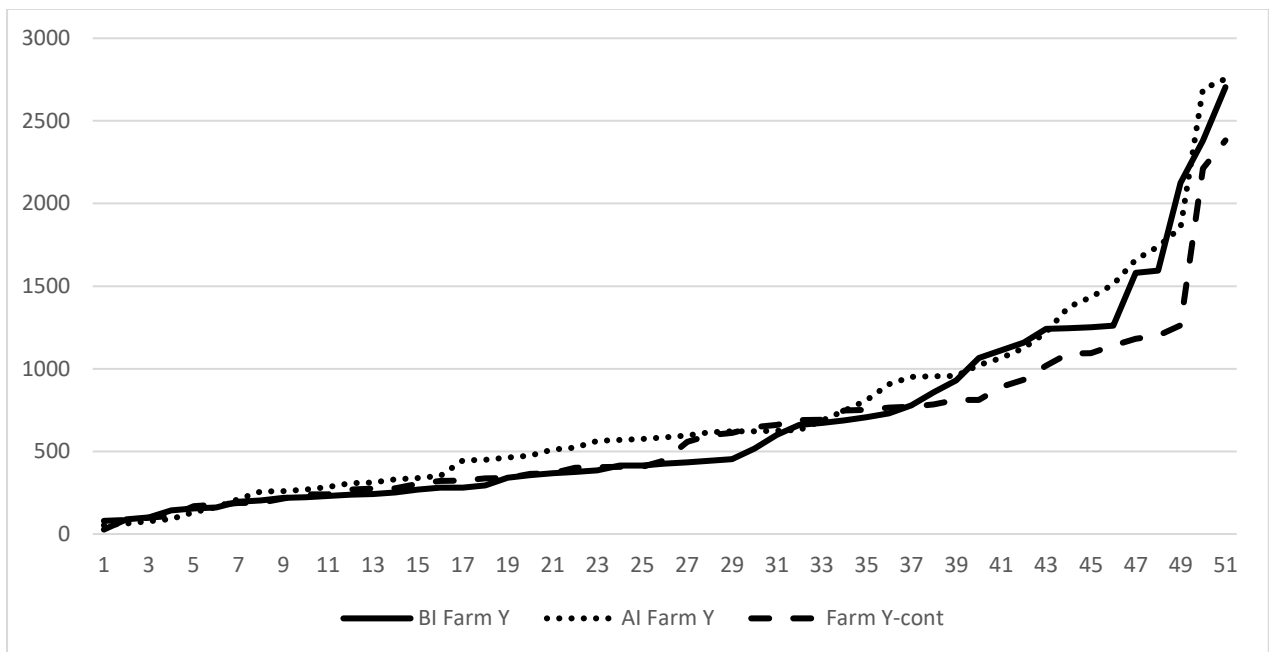


Figure 7.3b: Distribution of Overall Incomes, Excluding Outliers

Source: Author's Calculation

Figure 7.3b presents the same information in Figure 7.3a after the elimination of outlier figures. Outlier data refer to data that are exceptionally higher than others in a dataset. These cause other small data to be invisible. Removing them will mean the variables/information on the graph will be clearer.

After two outlier figures have been removed, the incomes of the after-intervention group are higher for the majority of the observations. This means that the AgResults program has had a positive impact on households' overall income.

7.4.4 Impact of Farmers' Income, Resulting from Agribusiness Support on the Consumption Pattern of the Rural Poor Smallholder Farmers

7.4.4.1 Change in the Farm Income

Table 7.7: Change in the Farm income

| | Control | Treated before intervention | Treated after intervention |
|--|--------------|-----------------------------|----------------------------|
| Avg. total income (NGN) (<i>total farm income + total non-farm income</i>) | 954,313.73 | 1,353,568.85 | 1,626,815.79 |
| Value of total harvest (NGN) per farmer (avg. yield * avg. sales price) | 1,097,061.89 | 671,443.79 | 1,180,539.96 |
| Total cost of a farmer contribution to production (NGN) | 209,715.00 | 118,687.79 | 103,528.17 |
| Avg. income per farmer (NGN) (<i>Value of total harvest – farmer's contribution to production</i>) | 887,346.88 | 552,755.99 | 1,077,011.79 |
| Avg. difference in incomes per farmer (NGN) (Treated AI vs Control) | n/a | n/a | 189,664.91 |
| Difference in income in percentage terms (Treated AI vs Control) | n/a | n/a | 18% |
| Avg. difference in income per farmer (NGN) (Treated AI vs Treated BI) | n/a | n/a | 524,255.80 |
| Percentage income increase (%) (Treated AI vs Treated BI) | n/a | n/a | 40% |

NGN stands for Nigeria Naira (US\$1 = NGN360). ha stands for a hectare

There was a significant change in farm income between the control and treatment groups before and after the intervention, as seen in Table 7.7. The average total income (NGN) increased by 40% in the treated before the intervention compare to the after-intervention group. The difference in the total income between the control and treated group after the intervention was however 20%. There was a reduction in the total cost of farmer contributions to production in the treated 'after intervention' group. This could be a result of the support provided by the implementer in the intervention in areas such as the purchase of fertilizer, harvesting, threshing, winnowing and bagging, as well as the purchase of bags, and the transportation of maize from farm to home as corroborated in Table 7.3. This implies that smallholder farmers spend little of their income on farming activities. There was an 18% increase in the average farm income per farmer between the treated after intervention group and the control group, and a 40% increase in the total farm income between the treated 'before intervention' and 'after intervention' groups.

7.4.4.2 Consumption Pattern

Table 7.8: Consumption Pattern of Respondents

| | Treated (AI) |
|--|--------------|
| Change in household consumption (%) | 80.7 |
| No change in household consumption (%) | 19.3 |
| Change in household consumption due to an increase in income (%) | 98.7 |
| Type of Change in Consumption Pattern | |
| The quantity of food consumed (%) | 8.2 |
| Quality of food consumed (%) | 41 |
| Variety of food consumed (%) | 21.3 |
| Increase in household size (%) | 0 |
| Quality and quantity of food consumed (%) | 16.4 |
| Others (%) | 9.8 |
| Type of Food Consumed More | |
| Protein foods | 39.1 |
| Protein foods and others | 56.5 |
| Processed foods | 4.3 |
| Type of Food Consumed Less | |
| Carbohydrate foods | 86.2 |
| Processed foods | 13.8 |

Table 7.8 shows that 80.7% of the respondents noted that there was a change in their household consumption. Of these, 41% noted that this change in consumption was related to a change in the quality of food. A proportion of the 23% noted that the change was related to the varieties of the food they now consume. A few (8.2%) noted an increase in the quantity of food consumed, and 16.4 noted an increase in the quality and the quantity of food at the same time. A small percentage (1.6%) noted an increase in the size of the household that had changed their consumption patterns. Almost all the respondents (98%) noted that the increase in household consumption was due to an increase in income under the intervention. Some of the remarks by respondents from the semi-structured interviews for the treated after intervention group included “*We eat better maize*”, “*We no longer eat one type of food, we change it every day now*”, “*We can use better cooking oil, we eat fish, meat, and eggs now*”, “*Before I limited my eating because my income was not much, but now I am able to eat and feed well*”. This implies that farmers in the intervention group had more money compared to the ‘before intervention’ group, as the AgResults program has reduced the level of poverty amongst smallholder farmers.

7.4.5 Relationship between Yield Obtained after Harvest and Resource use for Production

Equation 1: (Pooled data). These include data for all treated farms before and after the intervention. The effect of treatment is tested using the dummy variable (1) for farms after the intervention and 0 for farms before the intervention.

$$Y_{it} = \alpha + \beta_1 D_{it} + \beta_2 Fz_{it} + \beta_3 Ha_{it} + \beta_4 Mv_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Equation 2: (Time series data). These include data for control farms combined with treated farms. A dummy variable was used (1 for treated and 0 for control farms) to test if there was a significant positive or negative change after the intervention.

$$Y_{it} = \alpha + \beta_1 D_{it} + \beta_2 Fz_{it} + \beta_3 Ha_{it} + \beta_4 Mv_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Equation 3: (Time series data). These were data captured from the intervention group alone. The equation used a scorecard to test for statistically significant positive or negative change in after the intervention group.

$$Y_{it} = \alpha + \beta_1 SR_{it} + \beta_2 Fz_{it} + \beta_3 Ha_{it} + \beta_4 Mv_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Table 7.9: Summary result of regression analysis for yield obtained after harvest

| | Equation 1 | | | | Equation 2 | | | | Equation 3 | | | |
|---|----------------|--------|---------|---------|----------------|--------|---------|---------|----------------|--------|---------|---------|
| | Unstandardized | Beta | t-value | p-value | Unstandardized | Beta | t-value | p-value | Unstandardized | Beta | t-value | p-value |
| Constant / intercept | -1.038 | | -3.130 | 0.002 | -0.060 | | -0.242 | 0.809 | -0.985 | | -1.912 | 0.062 |
| Dummy Variable | 0.183 | 0.220 | 2.233 | 0.028 | 0.240 | 0.254 | 2.237 | 0.028 | | | | |
| Non-farm Income | 0.229 | 0.287 | 3.623 | 0.000 | 0.001 | 0.001 | 0.025 | 0.980 | 0.005 | 0.006 | 0.077 | 0.939 |
| Area of Land Planted (Ha) | 0.015 | 0.531 | 7.310 | 0.000 | 0.923 | 0.884 | 14.102 | 0.000 | 0.543 | 0.620 | 5.371 | 0.000 |
| Labour Input | 0.053 | 0.216 | 2.738 | 0.007 | 0.007 | 0.013 | 0.227 | 0.821 | 0.005 | 0.014 | 0.207 | 0.837 |
| Maize variety planted | -0.073 | -0.088 | -0.880 | 0.381 | -0.050 | -0.051 | -0.565 | 0.574 | -0.082 | -0.051 | -0.727 | 0.471 |
| Fertilizer | 0.097 | 0.226 | 2.855 | 0.005 | 0.185 | 0.358 | 5.353 | 0.000 | 0.112 | 0.244 | 3.311 | 0.002 |
| Scorecard | | | | | | | | | 0.258 | 0.378 | 3.773 | 0.000 |
| Number of Observations | 106 | | | | 110 | | | | 53 | | | |
| R-value | 0.743 | | | | 0.880 | | | | 0.814 | | | |
| R-Square | 0.552 | | | | 0.774 | | | | 0.790 | | | |
| F Statistics | 19.725 | | | | 48.639 | | | | 33.616 | | | |
| DW | 1.993 | | | | 1.760 | | | | 1.779 | | | |
| Breusch Pagan Test for Heteroscedasticity | 0.130 | | | | 0.868 | | | | 0.567 | | | |

Note:

Equation 1 includes farmers Before and After intervention groups (maize variety planted is not statistically significant as p-value below 99% significant level).

Equation 2 includes farmers in the Control and After intervention groups (Non-farm income, labour input and maize variety planted is not statistically significant as p-value below 99% significant level).

Equation 3 includes only farmers in the Intervention group (Non-farm income, labour input and maize variety planted is not statistically significant as p-value below 99% significant level).

Note: P-value significant at 99% level.

Table 7.9 presents the results of model, and the coefficients of the regression analysis for the yield obtained after harvest (metric tons) for the following sets of equations. Equation 1 focused on the analysis of the difference that exists between the treated group before and after the Intervention, Equation 2 examines the impact of the intervention on the treated group compared to the control group and Equation 3 focus on understanding the factors that could create impact on the treated group after the Intervention.

Equation 1 deals with the relationship between yield as a dependent variable (Y) and the following independent variable (Dummy Variable, Total Non-Farm Income (NGN)). These variables include Area of Land Planted (ha), Labour Input, Variety of Maize Planted as well as Quantity of Fertilizer (kg)). The regression estimation has an R^2 value of 0.552, and the independent variables explain 55.2% of the variability dependent variable, i.e. the yield obtained after harvest. $F(6, 96) = 19.725$, $p(0.000) < 0.05$, (i.e., the regression model is a good fit of the data). This implies that the independent variables together are statistically significant. The independent variables can explain the differences in yield within, and across the groups.

The dummy variable (DV) measures the effect of the intervention on the yield obtained after harvest. From the result of the analysis, the yield obtained after the intervention was better compared to before the intervention, with an unstandardized coefficient of 0.183 and $p(0.028) < 0.05$. This result implies that the quantity of yield after intervention in comparison to before intervention increased by 18 percent. Non-farm income had an unstandardized coefficient of 0.229 and $p(0.000) < 0.05$, which implies that a one percent change in non-farm income of the smallholder farmer leads to a 0.229 percent change in the quantity of yield obtained after harvest. The result is statistically significant at a 99% level of significance.

The area of land planted (ha) had an unstandardized coefficient of 0.015 and a P-value of 0.000. This result shows that one percent increases in the size of the planted area will lead to an increase in yield of about 0.015 percent as a measure of the change in the quantity of yield. The result is statistically significant at 99% level of significance. The result of survey reveals that labour input with an unstandardized coefficient of 0.053, has a P-value of 0.007 and is significant at 99%. This means that, for every one worker added to labour, there is a 0.053 percent increase in yield obtained after harvest. Fertilizer had an unstandardized coefficient of 0.097 and $P = 0.005$, is statistically significant. The unstandardized coefficient means, for a one percent change in fertilizer, there is a 0.097 percent increase in the quantity of yield obtained after harvest. Maize variety planted has an unstandardized coefficient of -0.073 and $p(0.381) > 0.05$. This has an inverse relationship with the yield obtained after harvest. This means that, for every unit increase in maize variety planted, there is reduction in the yield obtained after harvest of 0.097 percent.

Accordingly, standardized coefficients (beta) or weights presented in the table measure how much the outcome variable increases (in standard deviations) when the predictor variable is increased by one standard deviation, assuming other variables in the model are held constant. Hence the result of Equation 1 presented in Table 6.9 shows that the area of land planted is the highest contributing (0.531) predictor to explain the yield obtained after harvest. The second predictor variable is non-farm income (0.287), while fertilizer (0.226), follows as a dummy variable (0.220) as the fourth highest contributing predictor variable on the table. Labour input (0.216) was the fifth highest contributing predictor variable, while maize variety planted was the least contributing predictor variable to dependent variable (yield obtained after harvesting).

The Breusch Pagan test showed a value of 0.130, this implies that the model is free from heteroscedasticity and serial correlation disturbance.

The summary of regression analysis of Equation 2 shows an R^2 value of 0.774 and that independent variables is capable of explaining 77.4 percent of the variability of the dependent variable (yield obtained after harvest). $F = 48.639$ with $p(0.000) < 0.05$ (i.e., the regression model is a good fit of the data). This implies that the independent variables together are statistically significant with the dependent variable. The independent variables can jointly explain the differences in yield within, and across the groups.

The dummy variable had an unstandardized coefficient of 0.240 and a P-value of 0.028 This means that being involved in intervention programs increased yield by about 24 percent compared to the control group. The area of land planted was statistically significant at 99 percent level of significance, with an unstandardized coefficient of 0.923 and a P-value of 0.000. This means that, for every unit increase in the area of land planted, there was a 0.923 percent change in the yield obtained after harvest. The fertilizer was statistically significant at a 99% level of significance, with an unstandardized coefficient value of 0.185 and a P-value of 0.000. This means a one percent change in the quantity of fertilizer led to a 0.185 percent increase in the quantity of yield obtained after harvest. Non-farm income, labour input and maize variety planted are statistically insignificant.

From the beta coefficient, a further observation from the table reveals that the area of land planted (ha) is the highest contributing (0.884) predictor to explain the yield obtained after harvest, follow by fertilizer (0.358). The dummy variable (0.254) came third on the table, while non-farm income was the lowest contributing predictor in the model (0.001). (see Table 6.9).

The result of a Breusch Pagan Godfrey estimation (0.997) tests the null hypothesis that in the population there is homoscedasticity, and the error terms are not correlated.

Equation 3 measures the impact of AgResults on the yield obtained after harvest. The result of regression analysis produced a R^2 of 0.790, which implies that independent variables are capable of explaining about 79.0% variation in the dependent variable. The F-value of 33.616 was statistically significant; and the implication of this is that there are significant differences in yield within, and across the groups.

From the result, the unstandardized coefficient for area of land planted is 0.543, $p(0.000) < 0.05$. This means that for every one percent increase in the area of land planted, there is a 0.543 percent increase in the quantity of yield obtained after the harvest. The result is statistically significant at 99 percent significance. This result corroborates Ajah and Nmadu's (2012) argument that the amount of land cultivated is significant and positively related to maize output in their study area. Fertilizer has a coefficient of 0.112, and this is statistically significant since the P-value (0.002) < 0.05 is statistically significant at 95 percent level of significance. This means a single percentage increase in fertilizer leads to a 0.112 percent increase in the quantity of yield obtained after harvest. The result of the analysis further shows that the scorecard has an unstandardized coefficient of 0.353, with a P-value of 0.004. The positive sign of the coefficient means that the higher the scorecard the higher is the yield i.e. the higher is the number of support services provided by the implementers the higher is the farmers yield. This indicates that the services provided to farmers by implementers leads to a 0.353 percent increase in the quantity of yield obtained after harvest. Non-farm income, labour input, and yield obtained after harvest have a positive relationship, but their relationships with yield are statistically insignificant, while the maize variety planted has an inverse relationship with the quantity of yield obtained after harvest.

The beta coefficient obtained from the result of data analysis in Equation 3 (after intervention group) presented in Table 6.10 shows that the area of land planted (ha) contributed most to the dependent variable (yield) with a beta coefficient of 0.620. This is complemented by the scorecard (0.378) figure. Fertilizer has a beta coefficient of 0.244 and is the third most significant contributory variable to the yield (dependent variable) on the table. Maize variety planted (beta coefficient = 0.051), labour input (beta = 0.014) and non-farm income contributed least to the yield amongst all predictor variables (0.006).

Breusch Pagan Godfrey test had 0.567, and this implies that the model is free from heteroscedasticity and serial correlation disturbance.

7.4.6 Relationship between Total Farm Income and Resource use for Production

Equation 1: (pooled data). These include data for all of the participating farms. The effect of treatment was tested using a dummy variable: 1 for farms after the intervention, and 0 for farms before the intervention.

$$I_{it} = \alpha + \beta_1 D_{it} + \beta_2 Y_{it} + \beta_3 Hs_{it} + \beta_4 Sfg_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Equation 2: (Time series data). These include data for all respondents' farms. Data for control farms were combined with treated farms and a dummy variable (1 for treated and 0 for control farms) which tests for a significant positive or negative change after the intervention.

$$I_{it} = \alpha + \beta_1 D_{it} + \beta_2 Y_{it} + \beta_3 Hs_{it} + \beta_4 Sfg_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Equation 3: (Time series data). These include data for the intervention group alone. The equation used the scorecard to test for any statistically significant positive or negative change after the intervention.

$$I_{it} = \alpha + \beta_1 SR_{it} + \beta_2 Y_{it} + \beta_3 Hs_{it} + \beta_4 Sfg_{it} + \beta_5 NFI_{it} + \beta_6 LI_{it}$$

Table 7.10: Summary result of regression analysis for total farm income

| | Equation 1 | | | | Equation 2 | | | | Equation 3 | | | |
|---|----------------|--------|---------|---------|----------------|--------|---------|---------|----------------|--------|---------|---------|
| | Unstandardized | Beta | t-value | p-value | Unstandardized | Beta | t-value | p-value | Unstandardized | Beta | t-value | p-value |
| Constant | 3.896 | | 7.436 | 0.000 | 4.594 | | 12.710 | 0.000 | -2.736 | | -16.029 | 0.000 |
| Dummy Variable | 0.216 | 0.184 | 2.090 | 0.039 | 0.322 | 0.277 | 2.093 | 0.039 | | | | |
| Household Size | 0.008 | 0.107 | 1.243 | 0.217 | -0.012 | -0.116 | -1.677 | 0.097 | -0.032 | -0.016 | -1.480 | 0.146 |
| Non-farm Income | 0.212 | 0.190 | 2.108 | 0.038 | 0.038 | 0.036 | 0.520 | 0.604 | 0.002 | 0.001 | 0.123 | 0.903 |
| Labour Input | 0.025 | 0.072 | 0.778 | 0.438 | -0.030 | -0.049 | -0.720 | 0.473 | -0.011 | -0.022 | -2.016 | 0.050 |
| Yield | 0.009 | 0.412 | 4.523 | 0.000 | 1.089 | 0.848 | 11.362 | 0.000 | 0.164 | 0.124 | 6.216 | 0.000 |
| Sales at farm gate | -0.154 | -0.077 | -0.873 | 0.385 | -0.320 | -0.271 | -2.119 | 0.037 | 0.045 | 0.026 | 2.295 | 0.027 |
| Scorecard | | | | | | | | | 11.045 | 0.890 | 50.771 | 0.000 |
| Number of Observations | 106 | | | | 110 | | | | 53 | | | |
| R-value | 0.586 | | | | 0.805 | | | | 0.998 | | | |
| R-Square | 0.343 | | | | 0.648 | | | | 0.996 | | | |
| F Statistics | 8.630 | | | | 28.196 | | | | 1746.041 | | | |
| DW | 1.964 | | | | 1.908 | | | | 2.473 | | | |
| Breusch Pagan Test for heteroscedasticity | 0.389 | | | | 0.198 | | | | 0.353 | | | |

Note:

Equation 1 includes farmers Before and After intervention groups (Household size, labour input and sales at farm gate is not statistically significant as p-value below 99% significant level).

Equation 2 includes farmers in the Control and After intervention groups (Household size, non-farm income and labour input is not statistically significant as p-value below 99% significant level).

Equation 3 includes only farmers in the Intervention group (Household size, and non-farm income is not statistically significant as p-value below 99% significant level).

Note: P-value significant at 99% level.

Table 7.10 presents the result of the regression analysis for Equations 1, 2, and 3. Total farm income was the dependent variable, and the independent variables were dummy variable, household size, non-farm income, labour input, yield, sales at farm gate and support received from AgResults intervention program that replaced the dummy variable in Equation 3). The results of the data analysis for Equation 1 produced a R^2 value of 0.343, which means that the independent variables can explain about 34.3% of the variation in the dependent variable. The F-value was 8.630, indicating that the differences within and across the groups were statistically significant at a 99% level of significance with a P-value of 0.000.

The dummy variable in Equation 1 showed an unstandardized coefficient of 0.216 and a P-value of 0.039, which is statistically significant at a 99% level of significance. The result implies that farm income after intervention in comparison to before intervention increased by about 22 percent. From Table 7.10, the yield obtained after harvest had an unstandardized coefficient of 0.009 and a P-value of 0.000, which translates to a one percent increase in yield. This leads to 0.009 percent increase in total farm income. Total non-farm income had an unstandardized coefficient of 0.212 and a P-value of 0.038. This result is statistically significant at 99% level of significance. This implies a one percent increase in non-farm income which leads to a 0.212 percent increase in farm income. Household size has an unstandardized coefficient of 0.008, and a P-value = 0.217 > 0.05, and this is statistically insignificant. Labour input had an unstandardized coefficient of 0.025 and a P-value of 0.438 > 0.05. The result is statistically insignificant. The unstandardized coefficient of sales at the farm gate is -0.154, while the P-value is 0.385. This is an inverse relationship and is statistically insignificant. The result means selling at the farm gate leads to a -0.154 percent reduction in farm income.

The result of the beta coefficient for the model presented in Table 7.10 reveals that yield is the most contributing independent variable to total farm income with a beta coefficient of 0.412. Non-farm income (0.190) came second on the rank. Dummy variables and household sizes had beta coefficients of 0.184 and 0.107. They were third and fourth in the ranking, respectively. Sales at the farm gate (-0.077) contributed to the total farm income than labour inputs which had a beta coefficient of 0.072.

Breusch Pagan Godfrey tests had a value of 0.389. This implies that the model is free from serial correlation and heteroscedasticity.

Equation 2 focused on the control and after intervention groups. The result of the model showed $R^2 = 0.648$, which means that the independent variables explain about 64.8 percent of the dependent variable. The F-value was 28.196 and the P-value 0.000, which indicate that the differences within and across the groups are statistically significant.

The dummy variable had an unstandardized coefficient of 0.322 and a P-value of 0.039 <0.05, which is statistically significant at 95 percent level of significance. This means that being in the treatment group leads to a 32 percent increase in farm income amongst smallholder farmers. Yield obtained after the harvest had a positive impact on farm income with an unstandardized coefficient of 1.089 and a P-value of 0.000. This means a one percent increase in yield leads to 1.089 percent increase in farm income. Sales at the farm gate ($p=0.037$) were statistically significant, but the relationship of that variable with farm income was negative (coefficient = -0.320) meaning that additional increase in sales at the farm gate would reduce farm income by 0.320 percent. Non-farm income was positive but was also statistically insignificant with an unstandardized coefficient (0.038) and $P(0.604)>0.05$. Household size, $p(0.097)>0.05$, labour input (coefficient = -0.012, $p = 0.473$)>0.05 are statistically insignificant.

The beta coefficients ranked predictors according to their contribution to the dependent variable. In this case, yield obtained after harvest was the highest contributing (0.848) predictor to explain farm income. This is followed by the dummy variable (0.322), sales at the farm gate (-0.271), and household size (-0.116) while non-farm income contributed least to total farm income (dependent variable) and stayed in sixth position by ranking.

Breusch Pagan Godfrey tests for serial correlation and heteroscedasticity showed values of 0.198, and this implies that the model is free from serial correlation and heteroscedasticity disturbance.

The result of Equation 3 (after intervention group only) had an $R^2 = 0.996$, F-value of 1746.041, and a P-value of 0.000. The value of R^2 means that the independent variables explain about 99.6 percent of the dependent variables, while the F-value indicates the significant differences within and across the groups. The unstandardized coefficient presented in Table 7.10 for Equation 3 shows yield obtained after harvest (0.164), $p(0.000) <0.05$. This means a one percent increase in yield obtained after harvest leads to 0.164 percent increase in farm income. The relationship is statistically significant. Sales at the farm gate had a positive relationship with farm income, with an unstandardized coefficient of 0.045. The implication of this is that sales at the farm gate lead to a 6.045 percent change in farm income. This result is statistically significant at a 95 percent level of significance since the $p(0.027)<0.05$. scorecard that measures the number of services farmers received from implementers had an unstandardized coefficient of 11.045, and a p-value of 0.000 <0.05. This is statistically significant at 99.0 percent. The result means that an increase in the scorecard leads to a 11.045 percent increase in farm income. From the table, household size (unstandardized coefficient - -0.032, $p(0.146)>0.05$) is negative and statistically insignificant, and non-farm income (unstandardized coefficient = 0.002, $p(0.903)>0.05$), is negative and statistically

insignificant. Labour input has a negative relationship with farm income, with unstandardized coefficient = -0.011, $p(0.050)=0.05$. This means that an increase in labour input led to a 0.011 percent decrease in farm income.

From the result of beta coefficients, the predictor variable that contributed most to the dependent variable is the scorecard with beta coefficient of 0.890. This is followed by yield (beta coefficient = 0.124) and is third in the ranking in terms of sales at the farm gate, with a beta coefficient of 0.026. Non-farm income contributes least to the dependent variable (farm income) which stayed in sixth position by ranking.

The Breusch Pagan test result (0.353) implies that the model is free from serial correlation and heteroscedasticity.

7.5 Discussion of the Results

There was an increase in the output of the quantity of maize yield obtained after harvest among the intervention group due to the effect of price. The econometric analysis also corroborated the initial results on yield obtained after harvest (MT). The analysis showed a significant positive change in the yield obtained after the intervention. The standardized coefficient value, the area of land planted (ha), the inputs scorecard, and total household non-farm income are the variables that have a statistically significant effect on yield obtained after harvest as shown in Table 7.9. The results also show a significant positive change in the yield obtained after harvesting between the control, and after the intervention group. Based on the standardized coefficient value, the area planted, and the application of fertilizer had a statistically significant effect on yield obtained after harvest.

Generally, working with the implementers increased access to, and the use of more inputs as well as access through input financing from the implementers, rather than from personal funds. The latter were mostly unavailable or inadequate at the early stages of cultivation. This support reduced the need for personal financing required before the intervention. Nevertheless, the farmers also noted that some support came at the pre-planting stage, while others were at the postharvest stage of their farm activities. In terms of the semi-structured interviews, several responses supported this assertion. For example, a farmer working under a Babba ngona implementer in the Northwest of Nigeria stated that “*they (implementers) give us harvest advance and after, they removed their loan*”. Another farmer working with another implementer (Ahalson Limited) in the North Central noted that “*I received money from the implementer which I used in harvesting my maize*”. Lastly, another farmer under Agbelere Limited in the Southwest of Nigeria mentioned that “*they help me with money this year to develop my farm work*”.

The support received by the smallholder farmers from the implementers also helped reduce the total cost farmers contribute to production in the treated group, compared to the control group (see Table 7.3). The reduction in the farmers' contribution to the cost of production shows that the intervention reduced the burden generally borne by the smallholder farmers in terms of accessing finance from a commercial or financial institution. The Implementers sourced funds competitively from diverse areas. Some respondents under the structured interview opined that implementers make some money from the loans available to them and collect the returns at a later date without interest. For example, according to Agb Fam 4) *"they helped me with money this year to develop our farm work"* while TG Fam 3 *"I used to ask for loan and they give me, and I pay later"*. BG Fam 2 opined that implementers gave him harvest advances and removed their money after selling the farm produce. He noted *"they give us harvest advance, and after they remove their loan"*.

Although generally, there is a similarity between labour use patterns in both the control and the treated group, there is, however, a significant reduction in the use of a combination of family and hired labour in the treated group. The reduction in family labour in the treated group will have provided an opportunity for farmers to engage in other economic activity (both farm and non-farm) that could generate further income for the family. The reduction in hired labour as a result of the mechanization provided by the implementers reduced the labour-intensive approaches that were adopted under the control and treated group before the intervention groups.

Working with the implementers increased access to a high-end market that paid a better price. The support farmers received strengthened their production and aggregation capacity to move them away from subsistence production to market-driven methods. Although some of the respondents in the semi-structured interview still sell a percentage of their maize at the farm gate, 100% of respondents in the semi-structured interview sold most of their maize through the implementers at a better price than when they were not working with them. Some of their responses are presented below:

According to Agb Fam 5 *"they brought people to buy our maize"*, *"I don't look for buyers, the implementer does for me"* (TG Fam 2). TG Fam 3 explained that the implementers market their maize on their behalf *"they market my maize and I am very happy"*. BG Fam 2 and BG Fam 4 proved that they have more profit than selling the maize by themselves; *"if they market my maize for me I know I can get profit more than if I keep it"* (BG Fam 2), *"they buy our maize higher than the market price"* (BG Fam 4).

The support given by implementers improved the quality of products for the niche market and also supported increases in the aggregation of the primary commodities for easier access to

the market. The assertion was also supported by the aggregation level that increased from 36% in 2014 to 72% in 2017. This created the opportunity for premium payments for harvested maize to be made to farmers under the intervention (Narayan et al. 2019).

There is a difference in the average land cultivated across the groups, as shown in Table 7.4. An average of 4.49 ha was cultivated by the average farmer in the treated-after the intervention group, and 3.32 ha by farmers under the treated before the intervention group. The figures was 3.61 for farmers in the control group. The data showed growth in land use by close to 1 ha per farmer working with the implementers. Although the arbitrary increase in land cultivation does not necessarily lead to increased productivity, adopting several productive mechanisms combined with an increase in the land cultivated will, however, lead to higher production and more income as experienced in this study.

There was a high increase in income from smallholder farmers in the treated group compared to the control group, as shown in Table 7.8. This result corroborate with semi structured interview results from 7 respondent out of 15 sampled mentioned that the AgResults programme have positive impact on them. For example TG Fam 1 said *“I used to record more than five hundred thousand naira as profit but now I record more than two million naira as profit”*. Another one Wad Fam 1 stated that *“I receive a monthly salary and I I have improved my profit from maize farming”*. This high income came as a result of diverse factors which include the premium price received from the market due to the intervention of the implementers who supported the smallholder farmers on quality production and increase in yield, aggregation of the farm product that gave them a strong bargaining power for market (Narayan et al. 2019).

The econometric results also supported an increase in income through significant positive changes in the total farm income after the intervention, and between the control group and after- intervention group, as shown in Table 7.9. Based on the standardized coefficients, the yield obtained after harvest, the support giving by the implementers, and sales at the farm gate had a statistically significant effect on total farm income.

Increases in income amongst the treated group influenced diversification and changes in consumption patterns and diet amongst the households.

Chapter 8: Conclusion

In conclusion, the outcome of the study addresses the initial aim of the research, which was to conduct an empirical investigation to identify gaps in the role of agribusiness support in market-driven agricultural initiatives, and to assess the support available to increase productivity and the incomes of smallholder farmers with the aim of addressing rural poverty.

The results suggests that if smallholding farmers operating in a business managed environment under a market oriented agribusiness model like the AgResults initiative is contrasted with fragmented smallholder farmers that were not receiving support, the farmers under the initiatives reported a substantial increase in income, primarily because of the timely provision and support they received from implementers. Because they also focused on production tailored to market needs, they were able to sell their products at premium prices. These premium prices increased the revenue they generated, and further attributed their income increases to diversification in their consumption patterns to support healthier diets.

The research further addresses the effectiveness of the AgResults model as a means to enhance structural support for rural development and poverty alleviation. The model catalysed a reduction in the ineffectiveness of the smallholding system in agricultural practices. It also creates a solution to some specific critical structural challenges such as extension services, access to finance and inputs, land access and utilization for optimal output, and access to markets through a private sector driven agriculture managed system.

Unlike in the past where private sector in the agriculture sector are clustered primarily on the downstream (processing) of agricultural sector because of the perceived risk of upstream agricultural sector, this model encourage the development of private sector engagement at both the upstream and downstream. It developed support system for the critical area in the agriculture sector where the poor smallholder farmers are generally are in high numbers, clustered and disadvantaged because of the structural agricultural issue .

The agribusiness model adopted a symbiotic business relation system rather than dependent approach where farmers are viewed as partners rather than just beneficiary. The closest market-driven approach to this model in the literature is the “outgrowers scheme” , the outgrower scheme is however a multinational company oriented and model geared towards production for export processing, it does not focus on support for critical structural constraint as this model thus.

The research answered the three key research questions that led to this study; firstly, to understand the extent to which AgResults implementers (generally known as agricultural enterprises) can contribute to increased agricultural income for smallholder farmers through

support for agricultural production. Secondly, it set out to explore changes in the income of farmers resulting from agribusiness involvement. The aim here was to understand any impact on the consumption patterns of rural poor smallholder farmers. Finally, the study set out to understand which mechanisms might enhance the contribution of the AgResults implementers to support a change in the income of smallholder farmers to address poverty alleviation.

The summary findings of the research are set out below, and these also identify the implications of the research to knowledge and practice. Possible future research areas are also identified.

8.1 Summary of Research

The conceptual framework was based specifically on agribusiness initiative support for agricultural structural issues and poverty reduction through an agricultural market-driven approach. Both subjects are central to the overall research aim.

The study used a combination of survey and semi-structured interviews to generate primary data. The research sample consisted of 170 smallholder farmers; comprising of one hundred and four smallholder farmers for the treated group who were supported by the implementers of the AgResults project, and 66 smallholder farmers. The latter were a control group who were not supported by the project, but they had similar characteristics to the treated groups that were working on the project. Some 25 participants were also selected from both the treated and comparison groups to take part in semi-structured interviews.

Secondary data sources comprised of reviews of literature and other findings on subjects similar to this research. Secondary data came from several related project reports which include the AgResults Initiative Project Management Unit (PMU) annual reports, reports published by the project external evaluator, and business reports produced by agricultural enterprises that had worked under the AgResults project.

The survey results were initially analysed using descriptive statistics. Further quantitative measurements were made through an extrapolation and interpretation of meanings from textual interview data. The key features of the data collected were described using basic descriptive statistics (i.e., means and measures of frequency). Ordinary Least Square regression (OLS) was also used to investigate multivariate relationships between variables, and one-way analysis of variance (ANOVA) was used to test significant differences between means and two-way analyses of variance between groups. The result produced a direct response to the research questions.

8.2 Implications of the Research Findings and the Originality of the Research

The research addressed three main research questions as outlined below.

Research Question One: To what extent do AgResults implementers, generally known as Agricultural Enterprises, contribute to increased agricultural outputs amongst smallholder farmers?

Support for production inputs was received from the agricultural enterprises: The research showed that the implementers provide both on-farm and off-farm facilities such as threshing machines, community aggregation, storage facilities, and efficient and timely transportation for easier and timely access to the market. It showed that they also support the aggregation and warehousing of the crop produced, which improved on-product marketability into the premium market and further negotiation at a better price. The majority of the respondents under the AgResults confirmed they had received support from the planting stages through to the marketing of their product when working with the agricultural enterprise. The initiative created access to inputs and resources that were difficult to access by farmers not supported by the initiative. A total of 85% of the respondents received training and 77%, 76%, and 81% respectively accessed seed, herbicides, and fertilizers under the treated group (see Table 7.3). The majority of the smallholder farmers, however, do not necessarily have access to direct finance from the implementers. The support provided by the implementers from pre-planting to harvest might have resulted in low direct financial need by the smallholder farmers.

Increase in the Yield and Productivity: The result also showed that the support received from the agricultural enterprises did not particularly enhance the productivity of the farmers and the overall yield increased when the treated group was compared to the control group. In Table 7.4a and 7.9, the illustrated results reveal the yield obtained after harvesting amongst farmers working under the implementers compared to the control group. When disaggregated on different regions, the south-west contributes significantly to the overall reduction in the yield (Table 7.4c), as earlier mentioned, this might be due partly to the impact of the Fall army worm that ravaged most maize farms in the state starting from some of the farms in the State under the AgResults initiative in the South-west region. Nevertheless, there was a yield increase in maize production when compared to the national average and in the overall quantity of maize produce under the initiative due to an increase in the land cultivated, particularly in the South-west and north central regions. The increase in the yield compared to the national average was supported by the external evaluator review report that shows that, the direct result of the intervention by implementers was an increase in the average yield of maize production by smallholder farmers to 3 MT/ha in five years. The outcome in the yield exceeds the national

average of 1.69 MT/ha (AgResults Annual Report, 2019, Narayan et al. 2019; FAOSTAT 2019).

Research Question Two: What mechanisms could enhance the contribution of the AgResults implementers to support a change in the incomes of smallholder farmers to address poverty alleviation?

Increase in the Income: The results demonstrate an increase in the incomes of farmers under the AgResults initiative. Table 7.10 and 7.7 shows that farm income after intervention in comparison to before intervention increased, the average total income (NGN) of smallholder farmer increased by 20 percent in the treated before the intervention compare to the control group. The difference in the total income between the control and treated group after the intervention was 40 percent. This observation was supported by the project report which showed that implementers received an average premium payment of between 13 and 17 percent on the annual sales of maize grain, while smallholder farmers received an average of 11.5 percent premium payment (Narayan et al. 2019; AgResults Annual Report 2018).

Mechanisms that enhance income for smallholder farmers : The kind of support received by smallholder farmers may determine whether practices continue to be subsistence or not. The research shows that the critical support required for a market-driven agribusiness was received by smallholder farmers under the AgResults initiative, and this led to the income growth. Table (7.10) shows that the scorecard that composed of essential support, such as extension and training services particularly relating to Good Agronomic Practices (GAP), basic business and accounting management, as well as the provision of timely seeds, herbicides, insecticides, fertilizer, tractor services, finance and warehouse support were received under the AgResults initiative. This supported increased yield and created income for the smallholder farmers.

The implementers acted as the conduit between the farm, and town by supporting smallholder farmers with modern knowledge and skills in production and marketing. These are areas that have been traditionally lacking in public sector-driven extension services. Tables 7.2 and 7.3 show that many farmers working under the implementers received comprehensive advisory extension support from pre-planting through to marketing. Responses from the semi-structured interviews also corroborated the evidence from the survey. For example, some of the comments from smallholder farmers interviewed under the treated group after the intervention were as follows: *“I received training on management, proper fertilizer application and other modern planting techniques”*. *“The change in my yield has been because of the*

help from the implementer”, “my yield has increased because of the quality seeds and technical support from the implementer”.

The research further showed that the innovative system in terms of the aggregation of the crop and marketing approach that was also adopted by the implementers ensures that the smallholder farmers received prices that were high enough to provide production incentives and this would have reduced the costs associated with creating agricultural produce. Consistently, from the second year of the AgResults initiative, the level of crop aggregation for sale in informal markets was higher than the 50% used as one of the threshold parameters for movement from subsistence to production for the market (See Chapter three for more detail). As mentioned earlier in chapter five, the percentage of annual smallholder crop aggregation through the implementer for the formal market grew annually. The yearly data showed that, of the total annual production, the implementer aggregated approximately 36% in 2014, 56% in 2015, 55% in 2016, and 72% in 2017. They were further able to market most of the products in commercial markets and benefited greatly from premium payments for the products they sold to niche food and feed industries (AgResults Pilot Annual Report, 2017, Narayan et al 2019).

The impact of the implementer crop aggregation and marketing was further acknowledged in the semi structure interviews. One of the respondents who worked with an AgResults implementer said. *“The implementer assists in selling our maize and the price is a lot better”.* Another noted: *“If they market my maize for me I know I can get profit more than if I keep it”.*

The support received by farmers on extension services, inputs, training, aggregation warehousing and collective marketing through the implementer enhanced their ability to raise their production beyond subsistence, and to improve their collective bargaining position for the marketability of their product. This enhanced their income levels.

Poverty alleviation: Table 7.6 showed that although the proportion of the smallholder farmers that were poor reduced and non-poor increased under the intervention when considering the farm income compared to before the intervention and control group, the research however also shows that when the total income (combination of farm and non-farm incomes) is considered more people under the intervention went into poverty. This reflected the possible high concentration of the smallholder’s time on the farming activity at the detriment of the non-farm activities. The result support some understanding in the literature on the need to consider both the farm and non-farm sources of income when implementing agricultural driven poverty alleviation programmes (de, janvry et al 2005, IFAD 2011, Byerlee 2012).

Research Question Three: How does the change in income, resulting from agribusiness, impact on the consumption patterns of rural poor smallholder farmers?

Changes in Consumption Pattern: the results further showed that because of the increase in income through the intervention, smallholder farmers diversified their food consumption to include more nutritious food. The study showed that there was a major change in the consumption patterns of rural smallholder farmers and their households through the intervention. The shift in consumption included a change in the quality of food, diversification in food consumption, and an increase in the quantity of food consumed by household members (Table 7.8).

The study further showed that average household sizes were larger in the treated group. The average land size cultivated per farmer under the treated (before intervention) group in this study was at 3.2 ha. The research outcome showed that the assumptions in some literature that smallholder farmers are generally illiterate and uneducated is not necessarily the case (see Figure 7.1d). Although some of the respondents were uneducated (see Section 6.3.1), the majority had some form of education.

In addition to the key three research areas, this research outcome supports the perception that youth involvement in agriculture is still in its infancy in Nigeria. It shows that the majority of smallholder farmers under the program were adults with long-term experience of farming (see Figure 7.1b). The study showed that farmers in the control group had more experience in maize farming compared to farmers in the treated group. The experience of those in the control group was, however, not an 'agribusiness' experience. Rather, it could be characterised as 'subsistence' experience, as identified in their approach to agricultural practices. They had encountered reduced access to many resources that support optimal production for high yield and greater income.

8.3 Summary of Contributions: Implications for Knowledge

The outcome of the research, using all these approaches led to an eclectic and pragmatic report that represents a contribution to both knowledge and practice. This study is the first to examine the impact of agricultural enterprises on smallholder farmers under the AgResults initiative. It adds to the body of empirical literature on the role that Agribusiness initiatives can play in lessening the structural issues of agriculture. It explains how this can result in greater support for rural poverty alleviation in Nigeria. It further provided additional knowledge through a new approach that could be adopted for market-driven agriculture globally.

It can be concluded that market-driven agriculture through agribusiness is crucial to reducing most of the structural problems of agriculture, particularly when it comes to timely access to

support such as training, input, and mechanisation as well as good agronomical practices and innovations that are also essential to increase the quantity and quality of products. The smallholder farmers could access the necessary farm inputs required to produce high-quality crops. They were able to gain new skills to enable them to access quality-sensitive premium markets and grow their businesses from subsistence to market-driven enterprises.

The farmers were able to access the necessary farm inputs required to produce high-quality crops. This helped them to gain new skills and enabled them to access quality-sensitive premium output markets in order to grow their businesses from a subsistence to a market-driven model. This was enhanced through the support they received from participating farmers who contributed to the production of better-quality crops. These crops were aggregated for formal and informal markets under the agresults model.

The research further showed that smallholding farmers operating in a business managed environment contrasted with fragmented smallholder farmers that were not receiving support. They reported a substantial increase in income, primarily because of the timely provision and support they received from implementers.

The research also shows that smallholder farmers can increase their output where support is available and in a timely manner as demonstrated by the Implementers. As mentioned in earlier chapter where the structural issues of agriculture were evaluated, access to inputs are critical to high yield and increase production but are generally difficult for smallholder farmers that are fragmented to access in a timely manner for crop production at the right time. It can be concluded that market-driven agriculture through agribusiness is crucial to reducing most of the structural problems of agriculture, particularly in areas of timely access to support such as training, advisory extension services, inputs, aggregation and warehousing. Innovations that are also essential for the increase in quantity and quality of the products are also easily accessible.

The smallholder farmers could access the necessary farm inputs required for producing high-quality crop, gained skills to enable them to access quality-sensitive premium output markets and grow their businesses from subsistence to one with a market-driven objective, through the support received the participating farmers contributed to the production of better-quality crop and the crops were aggregated for the formal and informal markets under the agresults model. The research further showed that smallholding farming under a business managed environment compare to fragmented smallholder farmers that are not under such environment could experience substantial increase in income primarily because of the timely provision and support of the implementers.

The results show that productivity declines per hectare when the cost effectiveness of the AgResults agribusiness initiative conducted by the project evaluator however shows that the project cost \$85 for every \$100 increase in the smallholder farmers annual net income from the crop production of maize under the project (Narayan et al 2020).

Overall the AgResults Agribusiness initiative created an ecosystem that brings together most of the critical structural solutions to strengthen the smallholder farmers' participation in a market-oriented agricultural system. In so doing, they were able to optimally produce towards market demand rather than the traditional supply-driven approaches they adopted in the past. They focused on production tailored to market needs. They thus were able to sell their products at premium prices, The premium prices increased the revenue generated, and the smallholder farmers have further attributed their income increases to diversification in their consumption patterns to support healthier diets.

8.4 Summary of Contributions: Implication for practice

The results suggest that the AgResults model is a successful and innovative agribusiness approach that enhances efficient agricultural delivery. Through its strategic business management approach, the model creates possible collaborations between domestic private companies (Implementers) and smallholder farmers along the agricultural value-chain from production to the market. It represents an innovative way of partnering and interacting efficiently with smallholder farmers. It also demonstrates how the domestic private sector can support, and significantly address the existing structural challenges that impinge on the ability of smallholder farmers to be involved in market-driven agriculture in Nigeria.

The model catalysed a reduction in the ineffectiveness of the smallholding system in agricultural practices. It also creates a solution to some specific critical structural challenges such as extension services, access to finance and inputs, land access and utilization for optimal output, and access to markets through a public sector driven agriculture managed system.

Fellow practitioners could easily adapt and implement the methods used in this study on agriculture that is focused on market-driven approaches and support for smallholder farmers.

8.5 Research Limitations

There are a number of limitations that have emerged in the course of carrying out this research. These are summarised below.

There were several civil conflicts in some regions in Nigeria, and, more precisely, in most of the states in the Northeast region, and also some states in the South-South region of Nigeria.

Civil conflicts in these regions created limitations in terms of data collection in these areas. Hence these areas were not included in the scope of the study.

Data collection was also limited to the number of smallholder farmers that were available during the planting or harvesting seasons. This number varied depending on the agroecological zone. Limitations due to the availability of farmers during the planting and harvesting seasons meant that data had to be collected during both seasons. Collecting data from smallholder farmers across the different regions, and at various times in Nigeria required extensive travel across all of the regions. This represents a limitation in terms of the numbers of smallholder farmers that could be interviewed given the resources and time available for this study.

There were constraints in terms of access to females in areas where Islamic religion dominates, and particularly in the northern part of Nigeria. This constraint limited the usefulness of interviews to understand the female perspective. Nevertheless, data were collected from significant numbers of women in other regions.

There is also a limitation in the approach adopted with the use of scorecard. The possible implication of the scorecard variable is that all possible eight ways of support to the farmers by the implementers carry an equal weight. Using an equal weight does not allow for varying degrees of support in neither of the eight dimensions used to measure the support received by the farmers. Nevertheless, the use of scorecard was effective in representing the type of support the farmer receives from the implementer.

Others include the AgResults primary focus on on-farm activity sometimes to the detriment of the off-farm which is very important for income in the rural areas. Although on-farm contributes between 40-70% of the three quarter of rural income, off-farm income is however still a significant contributor to rural farmers.

8.6 Future Research

There are a number of potential future studies that could take place in the wake of this study., this study attempted to analyse the impact of agribusiness market-driven approaches in supporting smallholder farmers through the AgResults model, where data was available via the chosen data source. However, another agribusiness market-driven agricultural model that was not the focus of this research may be of interest to practitioners.

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Appendices

Appendix I: Survey Questionnaire

The role of market driven initiatives and support for rural poverty alleviation

Questionnaire for a Doctoral of Business Management Research

Summary of the research: The above study is set out to investigate the role played by market driven initiatives and support on rural poverty alleviation. The responses you shall give to the questions below will be treated with confidentiality and will be used purely for research purposes.



A. SECTION ONE : GENERAL INFORMATION

| | | |
|----|--------------------------------|--|
| 1. | Farmers' Name | |
| 2. | State | |
| 3. | Farmers' Local Government Area | |
| 4. | Farmers' Village | |
| 6. | Farmers' Farm Coordinates | |
| | Longitude | |
| | Latitude | |
| | Altitude | |
| 7. | Farmers' Phone Number | |

B. SECTION TWO: DEMOGRAPHIC CHARACTERISTICS

| | | | | | |
|------|----------------------------|-------------|-------------|-------------|--------------|
| 8. | Farmers' Sex | Male / / | Female / / | | |
| 9. | Farmers' Age | 20 - 30 / / | 30 - 40 / / | 40 -50 / / | above 50 / / |
| 10. | Farmers' Marital Status | Single / / | Married / / | Divorce / / | |
| 11. | Farmers' Ethnic Group | | | | |
| 12. | Farmers' Education Level | | | | |
| 13. | Years in Farming | | | | |
| 14. | What is the Household size | | | | |
| 15a. | What is your total Income? | | | | |

| | | |
|------|--------------------------------------|--|
| 15b. | What is your total Farm income? | |
| 15c. | What is your total Non- farm income? | |

C. SECTION THREE: AGRICULTURAL PRACTICE BEFORE INTERVENTION

| | | |
|------|---------------------------------------|--|
| 16a. | How long have you been Maize Farming? | |
|------|---------------------------------------|--|

| | | |
|------|---|--|
| 16b. | How long have you been doing maize Farming? | |
|------|---|--|

| | | |
|------|-----------------------------------|--|
| 16c. | Other Farm Enterprise | |
| i. | Are you into Arable Crop farming? | Yes / / No / / |
| | For what Purpose? | (i) Cash / / (ii) Food / / (iii) Animal Feed / / |
| ii. | Are you into Cash Crop farming | Yes / / No / / |
| | For what Purpose? | (i) Cash / / (ii) Food / / (iii) Animal Feed / / |
| iii. | Are you into Livestock farming? | Yes / / No / / |
| | For what Purpose? | (i) Cash / / (ii) Food / / |

D. SECTION FOUR: RESOURCE USE FOR PRODUCTION - PRE PLANTING

| | | |
|------|----------------------------|-------------------------|
| 17a. | Total Area of Land Planted | (Note: Maize Plot only) |
|------|----------------------------|-------------------------|

| | | |
|------|--------------------------|--|
| 17b. | Cost of Land Preparation | ₦ [If Free or Family Labor used, Tick ()] |
|------|--------------------------|--|

| | | |
|------|-----------------------|------------------------------------|
| 18a. | Maize Variety Planted | Improved Seed / / Local Grains / / |
|------|-----------------------|------------------------------------|

NB: If Local grains, move to the next section

E. SECTION FIVE: RESOURCE USED FOR PRODUCTION - PLANTING

| | | |
|------|--|---|
| 19a. | How much was spent on seeds for this farm? | ₦ |
|------|--|---|

| | | |
|------|--|----------------------------------|
| 19b. | Quantity of Maize Planted and Date of Planting | (i) _____ Kg (ii) ___/___/201___ |
|------|--|----------------------------------|

| | | |
|------|---|--|
| 19c. | Type of Labor used for planting | [If Free or Family Labor used, Tick ()] |
| i. | Source of Labor used for planting | (i) Family / / (ii) Free / / Hire / / |
| ii. | Cost of Labor used for planting | ₦ |
| iii. | How many hours did the laborer work in a day? | _____ Hours |
| iv. | How many months did the laborer work in a year? | _____ Months |
| v. | Amount of Fund used for planting | ₦ |

| | | |
|------|---|--|
| 20. | Type of Labor used for Weeding (1 st and 2 nd) | [If Free or Family Labor used, Tick ()] |
| i. | Source of Labor for Weeding (1 st and 2 nd) | (i) Family / / (ii) Free / / Hire / / |
| ii. | Cost of Labor used for weeding | |
| iii. | How many hours did the laborer work in a day? | _____ Hours |
| iv. | How many months did the laborer work in a year? | _____ Months |
| v. | Amount of Fund used for weeding | ₦ |

| | | |
|-----|---------------------------------------|---|
| 21. | Type of Herbicides used for Weeding | [If Free or Family Labor used, Tick ()] |
| I | Source of Herbicides used for Weeding | (i) Open market / / (iii) Neighbor / / Hire / / |
| ii | Amount of Fund used | ₱ |

| | | |
|-----|--|--|
| 22. | Types of Fertilizer used and quantity for production | (i) NPK _____kg (ii) UREA _____kg |
| I | Source of Fertilizer used | (i) Open market / / (ii) Neighbor / / Others _____ |
| ii | Amount of Fund used | ₱ |

| | | |
|------|---|--|
| 23a. | Type of Labor used for Fertilizer application | [If Free or Family Labor used, Tick ()] |
| I | Source of Labor used for Fertilizer application | (i) Family / / (ii) Free / / Others _____ |
| ii. | Cost of Labor used for Fertilizer application | |
| iii | Amount of Fund used | ₱ |

| | | |
|------|------------------------------------|--|
| 23b. | Source of fund used for fertilizer | (i)Personal funds / / (ii) Loan / / Others _____ |
|------|------------------------------------|--|

F. SECTION SIX: RESOURCE USED FOR PRODUCTION – HARVEST

| | | |
|------|-----------------|-------------------|
| 24a. | Date of Harvest | ___ / ___ / 201__ |
|------|-----------------|-------------------|

| | | |
|------|----------------------------|--|
| 24b. | Cost Incurred on Harvest | ₱ |
| i | Source of fund for Harvest | (i)Personal funds / / (ii) Loan / / Others _____ |
| ii | Amount of Fund used | ₱ |

| | | |
|------|-------------------------------------|--|
| 24c. | Type of Labor used for Harvesting | [If Free or Family Labor used, Tick ()] |
| i | Source of Labor used for Harvesting | (i) Family / / (ii) Free / / Others _____ |
| ii. | Cost of Labor used for Harvesting | |
| iii | Amount of Fund used | ₱ |

G. SECTION SEVEN: RESOURCES USED FOR PRODUCTION – POST HARVEST

| | | |
|------|------------------------------|--|
| 25a. | Cost Incurred on Threshing | ₱ [If Free or Family Labor Used, Tick ()] |
| i | Source of fund for Threshing | (i)Personal funds / / (ii) Loan / / Others _____ |

| | | |
|------|---------------------------------------|--|
| 25b. | Cost Incurred on Winnowing/Bagging | ₱ [If Free or Family Labor Used, Tick ()] |
| i | Source of funds for Winnowing/Bagging | (i)Personal funds / / (ii) Loan / / Others _____ |

| | | |
|------|--------------------------------|--|
| 26a. | Total cost of Bags for Bagging | ₱ |
| i | Source of fund for Bags | (i)Personal funds / / (ii) Loan / / Others _____ |

| | | |
|------|--|--|
| 26b. | Cost Incurred on Transportation of Bagged products from Farm to Home | ₱ [If Free or Family Labor Used, Tick ()] |
| i | Source of fund for Transportation from Farm to Home | (i)Personal funds / / (ii) Loan / / Others _____ |

H. SECTION EIGHT: MAIZE STORAGE (ON-FARM AND OFF-FARM)

| | | |
|------|---|--|
| 27. | How do you dry your Product? | (i) Sun dry / / (ii) Oven dry / / Others (Specify) _____ |
| i | Source of Dryer? | (i) Personal / (ii) Rent / / Others _____ |
| 28. | Do you measure moisture before storing? | Yes / / No / / |
| i | Source of Moisture meter? | (i) Personal / (ii) Rent / / Others _____ |
| 29. | What type of storage do you use? | (i) Silo / / (ii) Open air / / (iii) Ground / / (iv) Raised platform / / |
| i | Source of Storage facility? | (i) Personal / (ii) Rent / / Others _____ |
| 30a. | Do you use off-farm storage? | Yes / / No / / |
| i | Source of off-farm storage | (i) Personal / (ii) Rent / / Others _____ |
| 31b. | What type of off-farm storage do you use? | (i) Warehouse / / Others _____ |
| 32a. | Do you use on-farm storage? | Yes / / No / / |
| i | Source of on-farm storage | (i) Personal / (ii) Rent / / Others _____ |
| 32b. | What type of on-farm storage do you use? | (i) Warehouse / / Others _____ |

I. SECTION NINE: HARVEST AND MARKETING

| | | |
|------|--|------------------------|
| 33. | Yield Obtained After Harvest | _____ Kg or _____ MT |
| 34. | Quantity of Yield per area cultivated | _____ /Ha |
| 35a. | Was there any sales at the Farm Gate? | Yes / / No / / |
| 36b. | Quantity of Yield sold at Farm Gate | _____ Kg Price _____ ₦ |
| i. | What was the Maize used for? | |
| 37a. | Was any kept for consumption? | Yes / / No / / |
| 37b. | Quantity of Yield kept for consumption | _____ Kg _____ Bags |
| 38a. | Was any kept for Animal feed at home? | Yes / / No / / |
| 38b. | Quantity of Yield consumed as animal feed | _____ Kg _____ Bags |
| 39a. | Was the remaining maize used for other purposes? | Yes / / No / / |
| 39b. | If yes, State briefly | |
| 40a. | Was any sold? | Yes / / No / / |
| 40b. | Quantity of Sold | _____ Kg |
| 41. | Price Which it was Sold | _____ ₦ / Kg |
| | Sales of Products | |
| 42a. | What determines the price which the products are sold? | |
| 42b. | How did you source for Market? | |

| | | |
|------|---|---------------------|
| 43a. | Prevailing Market Price as at when was Sold | _____ ₦ / Kg |
| 43b. | Markets Which Price Was Compared With | _____ |
| 44. | How much of the harvest was lost? | _____ Kg _____ Bags |
| 45. | Why was the harvest lost? | _____ |

B

EVALUATION OF THE TYPE OF SUPPORT RECEIVED BY SMALLHOLDER FARMERS

J. SECTION TEN: AGRICULTURAL PRACTICES BASED ON THE INTERVENTION

| | | |
|------|--|--|
| 46a. | Are you working with any Implementer? | Yes / / No / / |
| 46c. | What is the name of the Implementer's company or organizations you are working with? | _____ |
| 46d. | How long have you been working with this Implementers? | _____ |
| 46e. | Do you receive any support from this implementer? | Yes / / No / / <i>If no , move to Section D</i> |
| 47. | What kind of support or services do you receive from the Implementer? | _____ |
| 47a. | Training? | Yes / / No / / |
| 47b. | Input supply? | Yes / / No / / |
| | What types of Inputs? | _____ |
| i. | Seeds? | Yes / / No / / |
| | What quantity of seed was used? | _____ Kg/Ha |
| | What type of Seed? | _____ |
| ii. | Fertilizers | Yes / / No / / |
| | What quantity of Fertilizer was used? | _____ Kg/Ha |
| iii. | Herbicides? | Yes / / No / / |
| | What quantity of Herbicide was used? | _____ Kg/Ha |
| | What type of Herbicides? | _____ |
| iv. | Insecticide | Yes / / No / / |
| | What quantity of Insecticide was used? | _____ Kg/Ha |
| | What type of Insecticides? | _____ |
| 47c. | Tractor Services? | Yes / / No / / |
| | What type of Tractor services? | _____ |
| 47d. | Financing? | Yes / / No / / |
| | What method of Financing? | _____ |
| 47e. | Warehousing? | Yes / / No / / |
| | What method of Warehousing? | _____ |

K. SECTION ELEVEN: RESOURCE USE FOR PRODUCTION - PRE PLANTING

| | | |
|------|--|-----------------------------------|
| 48a. | Total Area of Land Planted | (Note: Maize Plot only) |
| 48b. | Source of Land | Owned / / Rented / / Others _____ |
| 48c. | Is the land equipped with irrigation system? | Yes / / No / / |

| | | |
|-------------|---------------------------------------|---|
| 48d. | Cost of Land Preparation | ₦ [If Free or Family Labor used, Tick ()] |
| 49a. | Maize Variety Planted | Improved Seed / / Local Grains / / |
| 49b. | Source of the Maize seeds used | (i) Implementer / / (ii) Seed company / / (iii) Open market / / (iv) Neighbor / / Others _____ |

L. SECTION TWELVE: RESOURCE USED FOR PRODUCTION - PLANTING

| | | |
|-------------|---|---|
| 50a. | How much was spent on seeds for this farm? | ₦ |
| 50b. | Quantity of Maize Planted and Date of Planting | (i) _____ Kg (ii) ___/___/201___ |
| 51a. | Type of Labor used for planting | [If Free or Family Labor used, Tick ()] |
| i | Source of Labor used for planting | (i) Implementer / / (ii) Family / / (iii) Free / / (iv) Hire / / _____ |
| 52a. | Type of Labor used for Weeding (1st and 2nd) | [If Free or Family Labor used, Tick ()] |
| i | Source of Labor for Weeding (1st and 2nd) | (i) Implementer / / (ii) Family / / (iii) Free / / (iv) Hire / / _____ |
| 52b. | Type of Herbicides used for Weeding | [If Free or Family Labor used, Tick ()] |
| i | Source of Herbicides used for Weeding | (i) Implementer / / (ii) Open market / / (iii) Neighbor / / Others _____ |
| 53a. | Types of Fertilizer used and quantity for production | (i) NPK _____ kg (ii) UREA _____ kg |
| i | Source of Fertilizer used | (i) Implementer / / (ii) Open market / / (iii) Neighbor / / Others _____ |
| 53b. | Type of Labor used for Fertilizer application | [If Free or Family Labor used, Tick ()] |
| i | Source of Labor used for Fertilizer application | (i) Implementer / / (ii) Family / / (iii) Free / / (iv) Hire / / _____ |
| 53c. | Source of fund used for fertilizer | (i) Personal funds / / (ii) Implementer / / |

M. SECTION THIRTEEN: RESOURCE USED FOR PRODUCTION – HARVEST

| | | |
|-------------|--|---|
| 54a. | Date of Harvest | ___/___/201___ |
| 54b. | Cost Incurred on Harvest | ₦ |
| i | Source of fund for Harvest | (i) Personal funds / / (ii) Implementer / / Others _____ |
| 54c. | Type of Labor used for Harvesting | [If Free or Family Labor used, Tick ()] |

| | | |
|----------|--|---|
| i | Source of Labor used for Harvesting | (i) Implementer / / (ii) Family / / (iii) Free / / (iv) Hire / / |
|----------|--|---|

N. SECTION FOURTEEN: RESOURCES USED FOR PRODUCTION – POST HARVEST

| | | |
|------------|-------------------------------------|---|
| 55. | Cost Incurred on Threshing | ₦ [If Free or Family Labor Used, Tick ()] |
| i | Source of fund for Threshing | (i) Personal funds / / (ii) Implementer / / Others _____ |

| | | |
|------------|--|---|
| 56. | Cost Incurred on Winnowing/Bagging | ₦ [If Free or Family Labor Used, Tick ()] |
| i | Source of funds for Winnowing/Bagging | (i) Personal funds / / (ii) Implementer / / Others _____ |

| | | |
|------------|---------------------------------------|---|
| 57. | Total cost of Bags for Bagging | ₦ |
| i | Source of fund for Bags | (i) Personal funds / / (ii) Implementer / / Others _____ |

| | | |
|------------|---|---|
| 58. | Cost Incurred on Transportation of Bagged products from Farm to Home | ₦ [If Free or Family Labor Used, Tick ()] |
| i | Source of fund for Transportation from Farm to Home | (i) Personal funds / / (ii) Implementer / / Others _____ |

O. SECTION FIFTEEN: MAIZE STORAGE (ON-FARM AND OFF-FARM)

| | | |
|------------|-------------------------------------|--|
| 59. | How do you dry your Product? | (i) Sun dry / / (ii) Oven dry / / Others (Specify) _____ |
| i | Source of Dryer? | (i) Personal / / (ii) Implementer / / (iii) Rent / / Others _____ |

| | | |
|------------|--|--|
| 60. | Do you measure moisture before storing? | Yes / / No / / |
| i | Source of Moisture meter? | (i) Personal / / (ii) Implementer / / (iii) Rent / / Others _____ |

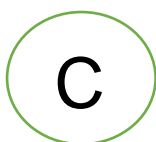
| | | |
|------------|---|---|
| 61. | What type of storage do you use? | (i) Silo / / (ii) Open air / / (iii) Ground / / (iv) Raised platform / / |
| i | Source of Storage facility? | (i) Personal / / (ii) Implementer / / (iii) Rent / / Others _____ |

| | | |
|-------------|-------------------------------------|--|
| 62a. | Do you use off-farm storage? | Yes / / No / / |
| i | Source of off-farm storage | (i) Personal (ii) Implementer Others (Specify) |

| | | |
|-------------|--|------------------------------------|
| 62b. | What type of off-farm storage do you use? | (i) Warehouse / / Others (Specify) |
|-------------|--|------------------------------------|

| | | |
|-------------|------------------------------------|--|
| 63a. | Do you use on-farm storage? | Yes / / No / / |
| i | Source of on-farm storage | (i) Personal (ii) Implementer Others (Specify) |

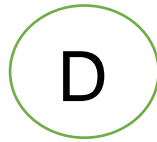
| | | |
|-------------|---|------------------------------------|
| 63b. | What type of on-farm storage do you use? | (i) Warehouse / / Others (Specify) |
|-------------|---|------------------------------------|



IMPACT ON PRODUCTIVITY OF THE SMALLHOLDER FARMERS AND INCOME

P. SECTION SIXTEEN: HARVEST AND MARKETING

| | | |
|-------------|--|--------------------------------|
| 64a. | Yield Obtained After Harvest | _____ Kg or _____ MT |
| 64b. | Quantity of Yield per area cultivated | _____ /Ha |
| 65a. | Was there any sales at the Farm Gate? | Yes / / No / / |
| 65b. | Quantity of Yield sold at Farm Gate | _____ Kg Price _____ ₦ |
| 66a. | Was any kept for consumption? | Yes / / No / / |
| 66b. | Quantity of Yield kept for consumption | _____ Kg _____ Bags |
| 67a. | Was any kept for Animal feed at home? | Yes / / No / / |
| 67b. | Quantity of Yield consumed as animal feed | _____ Kg _____ Bags |
| 68a. | Was any sold? | Yes / / No / / |
| 68b. | Quantity Sold | _____ Kg |
| 69. | Price which it was Sold | _____ ₦ / Kg |
| 70a. | Prevailing Market Price as at when was Sold | _____ ₦ / Kg |
| 70b. | Markets Which Price Was Compared With | |
| 71a. | How much of the harvest was lost? | _____ Kg _____ Bags |
| 71b. | Why was the harvest lost? | |



SECTION Q: HOUSEHOLD SIZE, FARM AND NON FARM INCOME

| | | |
|------|---|---|
| 72. | Farmers Household size | |
| 72a | How many members of your household perform on-farm activities | |
| 72b | How many members of your household perform off-farm activities | |
| 72c | How many members of your household are dependent on the farm output | |
| 73a. | What was your average annual income from farming? | _____ ₦ / year |
| 73b. | What was your average annual income from non-farming activities? | _____ ₦ / year |
| 74a. | What is your average annual income from farming? | _____ ₦ / year |
| 74b. | What is your average annual income from non-farming activities? | _____ ₦ / year |
| 75a. | What is your total income? | |
| 75b. | What is your total farm income? | |
| 75c. | What is your total Non- farm income? | |
| 75d. | What is your total income from the Implementer's Intervention Farming? | |
| 76. | What consequence does the poor economic condition have on your welfare? | |
| 77. | What do you use the income from the Maize farming under the intervention for? | (i) Buy more food (ii) Invest in non-farm business – if non-farm business, Discuss (iii) Others |
| 78. | Are there changes to the non-farm enterprise income? | Yes / / No / / |
| i. | Has there been a decrease in the non-farm enterprise income? | Yes / / No / / |
| ii. | Has there been an increase in the non-farm enterprise income? | Yes / / No / / |
| 79. | Has the consumption at home differed since the intervention? | Yes / / No / / |
| i. | Is this due to the increase in income or something else? If something else, what is it? | |
| ii. | What is the change in consumption? | |
| iii. | What type of food is consumed more? | |
| iv. | What type of food is consumed less? | |
| v. | Why type of food are they consuming more or less? | |

How does the change in income, resulting from agribusiness, impact on the consumption pattern of the rural poor smallholder farmers?

Do you have strongly held views on this subject matter that you have been unable to express owing to the structured nature of this questionnaire? If so, please make further comments



Appendix II: Semi Structured Interview Question

The role of market driven initiatives and support for rural poverty alleviation

Questionnaire for a Doctoral of Business Management Research

Summary of the research: The above study is set out to investigate the role played by market driven initiatives and support on rural poverty alleviation. The responses you shall give to the questions below will be treated with confidentiality and will be used purely for research purposes.

A. GENERAL INFORMATION AND DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT.

Tell me about yourself, your family and experience in farming. Please start with your name.

- Are you married?
- How many children do you have?
- How many are you in your family?
- What is your educational status?
- How long have you been into the farming business?
- Apart from farming do you engage in other activities to generate income? How much do you make from this activity?
- On average what will you say is your total household income from all your farming activities?
- From your maize farming, what would you say is the average amount of money you make in year?

B. AGRICULTURAL PRACTICE BEFORE INTERVENTION

- How long have you been farming maize?
- Apart from maize are there other crops you far? What are they? Why do you farm these crops and not only maize?
- How big is your maize farm? Is the land your own?
- How do you do your farming? Do you use your family to help you out or you hire laborers or you use tractors and other machines?
- What type of maize seeds do you plant? How do you source for them? What quantity do you usually use?

- What time of the year do you normally begin your planting activities? Why is this so?
- When you plant how long before you weed? Do you use herbicide? If no, why?
- How about fertilizers, do you use them? What quantity? How do you get them?
- Do you hire laborers to plant, weed and spray fertilizer on your farm? How often do they do this?
- What are the major challenges you face in your farming business?

C. RESOURCE USED FOR PRODUCTION – HARVEST AND POST - HARVEST

- What time of the year do you normally harvest your maize? Why?
- On average how what quantity of maize do you harvest from your farm? Why is this the case?
- Can you tell me how you usually harvest your Maize? What process do you follow?
- How long do you dry the maize before packing them? Where and how do you do this?
- Do you thresh the maize? How do you bag them?
- Do you get people to help you? How do you pay them?
- How do you transport the maize from the farm?
- Where do you keep the maize when you take them from the farm? Why?
- Do you experience any loss when you harvest? What was the cause?

D. MARKETING

- How do you normally sell your maize?
- Where do you sell your maize? How do you get customers?
- The maize you farmed, was it a specific type that your customers wanted?
- Did you sell all the maize you harvested? How did you distribute the maize?
- From your calculation, how will you compare the amount of money you put into your maize farming and what you got as profit when you sold the maize? Did you make profit? How do you know that you made profit? Do you record all the things you spent money on?

EVALUATION OF THE TYPE OF SUPPORT RECEIVED BY SMALLHOLDER FARMERS

E. AGRICULTURAL PRACTICES BASED ON THE INTERVENTION

- Why are you working with (mention the name of the implementer)
- How long have you been with this implementer?
- What kind of arrangement do you have with this implementer? Are you happy with it or is there anything you would like to change? What are these things?

- Has working with him helped to increase your farming conditions and output?
- Do you receive any training? What type? How often?
- How about inputs? What type of inputs does the implementer assist you with? Are there given free or do you pay for them? How do you pay for them?
- **Since you started working with this implementer, have you increased the size of your farm?**

F. RESOURCE USED FOR PRODUCTION – PLANTING

- Does the implementer assist in your planting activities for your maize farm? If yes, how. If no, why?
- Do you use hire labor for some of your farm activities? Which activities? How do you pay them?
- Since you started working with the implementer, has the maize variety and quantity you use changed? How?

G. RESOURCE USED FOR PRODUCTION – HARVEST

- How does the implementer participate in your harvesting activities? What specific roles does he play?
- How has things changed from the way you harvest your maize since working with an implementer?
- How do you transport your maize from the farm to where you keep them?

H. MAIZE STORAGE (ON-FARM AND OFF-FARM)

- What role does the implement play in the storage of your maize after drying and bagging?
- Does the implementer assist in providing a storage facility? Is it free? Do you pay for it?
- What type of storage facility do you use? Why?

IMPACT ON PRODUCTIVITY OF THE SMALLHOLDER FARMERS AND INCOME

I. HARVEST AND MARKETING

- Has your yield changed since you started working with this implementer? To what extent? What do you think is responsible for the change?
- Do you sell some of your maize at the farm before transporting them to your store or house? Why? Why not?
- Does the implementer assist in selling your maize? Why?

Q. HOUSEHOLD SIZE, FARM AND NON FARM INCOME

- In your house, how many people depend on the money you make from your farming activities? Why?
- What other activities aside from farming do you engage in to generate income for your household?
- Has your income changed since you started working with this implementer? To what extent? Why?
- Has the size of your family changed? What is the number of people in your household?
- How much in money terms would you say you have benefitted from working with this implementer?
- What consequences does the poor economic condition have on your welfare?
- The money you make from your maize farming, how do you use it?
- Has your consumption pattern changed since you started working with this implementer? How?