CHAPTER ONE
INTRODUCTION

1.1 Background of the study

In developing countries in which Nigeria is one, agriculture dominates the economy of the nation. It has been established that about 70 percent of Nigeria population is engaged in agriculture (Obasi and Agu, 2000) while 90 percent of Nigeria total food production comes from small farms and 60 percent of the country population earn their living from these small farms. The recent importation of food items into the country to make up for the shortfalls in food supply is a dangerous indication of dwindling farm productivity and warning sign that if the nation continues with the business as usual, the prospect of food security will be bleak for millions of people (Nweze, 2003).

The fall in agricultural production could be attributed to inadequate infrastructure, under mechanization and inadequate finance. According to (Ojo, 2005), one problem confronting small-scale enterprises including agriculture, is inadequate capital. Inadequate finance has remained the most limiting problem of agricultural production. This is because capital is the most important input in agricultural production and its availability has remained a major problem to small-scale farmers who account for the bulk of agricultural produce of the nation. In Nigeria, credit has long been identified as a major factor in the development of agricultural sector. Credit is considered the catalyst that activates other factors of production and makes under-used capacities functional for increased production (Ijere, 1992). It is a major factor necessary for technological transfer in traditional agriculture (Oyatoye, 1981). Farm credit can be obtained from either the formal source which includes the banks and other government-owned institutions or the informal sources which are self help groups, money lenders, cooperatives and non-government agencies (NGO). According to Oyatoye(1981), the informal source of credit is more popular among small-scale

farmers which may be due to the relative ease in obtaining credit devoid of administrative delay, non-existence of security or collateral, flexibility built into repayment which is against what is obtained in the formal sources.

Ojo (2000), observed that the institutional lending system has failed to meet the objectives for which they were set up. According to him, only 15 percent of the trading bank credit to agriculture has been recovered. The major short-comings of their transactions, he observed, are due to the inaccessibility of these funds to rural farmers as a result of bureaucratic procedures and high service cost, which are very difficult for the farmers to meet. The situation has attracted the attention of Nigeria government to the creation of specialized institution such as the Nigeria Agricultural Cooperative and Rural Development Bank (NACRDB) to cater for the credit needs in the agricultural sector.

However, Alufohai and Ahmadu (2005), studied its management and reported its ineffectiveness in credit delivery. In spite of the importance of loan in agricultural production, its acquisition is fraught with a number of problems. The small-scale farmers are forced to source for capital from relations, money-lenders and contribution clubs. These are known to be ineffective in providing capital for substantial increase in agricultural production. The last hope for the small-scale farmers then lies with the cooperative societies (Ijere, 1981). The cooperative has been identified to be better channel of credit delivery to farmers in term of its ability to sustain the loan delivery function (Alufahai, 2006). Thus, there is need for their sustainability. Cooperatives are defined as autonomous association of persons who unite voluntarily to meet their common economy and social needs and aspiration through a jointly-owned and democratically-controlled enterprise. Cooperatives are established by like-minded persons to pursue mutually beneficial, economic interest. Researchers are of the opinion that under normal circumstances, cooperative play significant roles in the provision of services that enhance agricultural development. It described cooperatives

as a medium through which services like provision of farm inputs, farm implements, farm mechanization, agricultural loans, agricultural extension, members education, marketing of members farm produce and other economic activities and services are rendered to members. Regular and optimal performance of these roles will accelerate the transformation and sustainability of not only the cooperatives but the revampment of agricultural and rural economic development. Ijere (1981), further explains that it is the cooperative that embraces all type of farmers, and a well organized and supportive cooperative is a pillar of strength for agriculture in Nigeria. Previous studies have shown that cooperatives carry out the function of credit delivery to farmers but there's ample evidence that farmers face difficulties in obtaining credit and the problem of sourcing for capital still lingers on. However, much of the credit supplied through cooperatives gets used up for consumption purposes and, therefore, not productive. If members of the cooperatives ever happen too feel that the credit coming forth from the cooperatives is not yielding adequate or no returns, and repayment of loans borrowed from them is inescapable, they may stop patronizing them.

The presumption that cooperative groups can bring down cost of lending, reduce over-head cost and can come to be aid of those who need credit mostly the rural poor made National Cooperative and Rural Development (NACRB) to extend their support to the societies, (Ijere, 1981). Also, the fact that most cooperative groups are formed by women, who by nature are thrifty and honest made everyone see cooperative groups as having a great future. The progress achieved by the groups in South-South States of Nigeria is heartening. Cooperatives have grown from strength to strength in the States and the policies of the government with their emphasis on women empowerment have much to do with this.

The continuing existence of cooperatives and their sustainability, therefore, depends upon how well the low skill intensive products turned out by the members of the cooperative societies are received by the farmers.

The Cooperative Movement since Strickland's report in 1934 has come to stay. And since then various forms of agricultural and non-agricultural cooperatives have sprang up. According to Toluwase and Akpata (2013), emphasis on cooperative development is now on multipurpose agricultural cooperatives for food production and marketing. At present, ninety-six percent of cooperative societies in this country are designed basically to serve the needs of agriculture even the four percent which constitute non-agricultural cooperative societies have great relevance for agriculture and use agricultural products and by-products. They also noted that the original impetus for the organization of cooperatives in Nigeria came from agriculture, or more precisely the marketing of cash crops for export. Since then cooperative development has taken different forms and dimensions.

1.2 Statement of the Problem

Agriculture in the post independent years was the mainstay of Nigeria's economy but suffered serious neglect due to the oil boom in 1970's. Agricultural production which then contributed about 80% to Gross Domestic Product (GDP) declined to less than 3% in the 1990's and 2000's as a result of neglect by successive administrations (Toluwase and Akpata, 2013). Hence, the largely subsistence agricultural sector has failed due to inadequate utilization of fund meant for agricultural production to keep up with rapid population growth thereby forcing our Africa's most populous country (a country once a large net exporter of food) to the importation of food. That agricultural production in Nigeria has dwindled is not surprising considering that the sector has not been able to overcome the myriad of challenges that has constrained it. As Ukeje, in Taiwo and Onugu, (2014) noted:

> *...although appreciable real output growth rates have been achieved in the agricultural sector in the last five years, a significant break-through in productivity to effectively guarantee domestic self-sufficiency is still*

> *constrained by a number of challenges. These challenges are the inadequacies in the supply and delivery of farm inputs; shortages of working capital; low rate of technology adoption; diseases and pests infestations; poor post-harvest processing and storage technology; environmental hazards; and land constraint.*

As a way out of the morass of declining agricultural production many have suggested the necessity of increasing the involvement of agricultural cooperatives.

The Food and Agricultural Orgnisation (FAO) in 2010 was emphatic that cooperatives could make the needed impact in food security efforts through mobilizing farmers, women and finance and in agricultural marketing. They were in agreement that agricultural co-operatives encourage members to engage in joint cultivation of food and cash crops, purchase farm inputs at subsidized price and create better producers' price for their farm products. They noted that cooperatives are based on the powerful idea that together people can achieve goals that none of them can achieve individually. It has been considered as a third force, an alternative and countervailing power to both big business and government (ICA, 1995). In view of the low financial capacity and high level of under-development, an individual farmer cannot achieve the desires for large-scale production. It is, therefore, in the farmers' interest that resources are pulled together so as to gain a tremendous collective advantage and thus widening the industrial base of the economy and the management techniques. For instance, farmers' co-operative societies are formed to bring in more agricultural inputs and product marketing services to members, increase competition in the agricultural service sector and provide savings and credit to members, among many other functions. Small-holder farmers stand a better chance with the formation of agricultural co-operatives (Yamusa and Adefila, 2014).

The thinking of Osuntogu, as cited in Yamusa and Adefila, (2014) that cooperative will enable the removal of element of old social order which impede development and bring about increase in food production among the small-holding farmers appears to have influenced successive governments in Nigeria to recognize cooperative societies as essential for the development of the agricultural sector. Indeed, the establishment of Agricultural Development Projects (ADPs), River Basin and Rural Development Authority (RBRDA), Fadama II and III Projects had cooperative components that organize farmers under the schemes into co-operative societies for better coordination and accessibility to various agricultural facilities (Yamusa and Adefila, 2014). But has agricultural cooperatives lived up to this expectation?

Yamusa and Adefila, (2014) has warned that there are many challenging experiences facing agricultural co-operatives, such as stiff competition, sometimes without clear rules, controlling government policy and legislation, leadership, management and governance challenge. The others include, member participation and empowerment and the challenge of capital investment in co-operatives. While the first two are clearly in the government's domain and, therefore, necessitates government action. The last three are clearly issues that have to be resolved by the cooperatives themselves. Indeed, it would be pertinent to find out how capitalization and membership of cooperative has grown over the years and how these have impacted on the core services of agricultural cooperatives, including farm input supply, credit delivery and agricultural extension services. Furthermore, there is also the question of whether these services have impacted positively on farm output of cooperative members. Unfortunately, extant literature has not addressed the above issues as they relate to Enugu State or any other South-East State. Detailed and appropriate information on the above is a necessity for appropriate and effective agricultural and cooperative policies that will reposition the cooperative sector as a major participant

in the nation's quest for increased agricultural production. Though the recent government policies on food production have been on the increase, there are no adequate storage facilities to take care of the increase. This has been the reason why distribution of the agricultural output has not been adequate enough to make the impact being felt in the life of the people. People still go to bed hungry while there is increase in production and food wastages, and again people form ad hock cooperative societies for the sole aim of collecting loans from government, only to disband the societies shortly after. The study will try to examine whether or not agricultural cooperative are organized by members who are ready to stays long in the societies can be of help in solving these indentified problems.

1.3 Objectives of the Study

The broad objective of this study is to examine the effects of agricultural cooperatives on agricultural crop production in Enugu State.

The specific objectives are to:

1. Identify the effect of socio-economic characteristics of members on farm output
2. Examine the relationship between value of farm output of farmers and years of cooperative membership.
3. Determine influence of farm inputs, credit and agricultural extension services obtained from cooperative on farm output.
4. Relate efficiency levels of farm input utilization to years of cooperative membership.
5. Relate profitability on sales of agricultural products to years of cooperative membership.

6. Determine the influence of member's socio-economic characteristics on profitability of their farm.

7. Determine the perceptions of members on the contributory role of cooperatives on agricultural production.

1.4 Research Questions

1. How is agricultural output of farmers related to years of cooperative membership?
2. To what extent is farm output of members influenced by farm inputs, credit and agricultural extension services obtained from cooperative?
3. Is there a relationship between efficiency levels of farm input utilization and years of cooperative membership?
4. Is profitability on sales of agricultural products related to years of cooperative membership?
5. To what extent is the profitability of the farm dependent on socio-economic characteristics of the member?
6. Is there a relationship between members' perceptions of the contributory roles of cooperative on agricultural production and years of cooperative membership?

1.5 Hypotheses

1.H_0: There is no significant relationship between agricultural output of farmers and years of cooperative membership.

H_1: There is significant relationship between agricultural output of farmers and years of cooperative membership.

2.H_0: Farm output of farmers is not significantly influenced by farm inputs, credit and agricultural extension services obtained from cooperative.

H_1: Farm output of farmers is significantly influenced by farm inputs, credit and agricultural extension services obtained from cooperative.

3.H_0:. There is no significant relationship between efficiency levels of farm resource utilization and years of cooperative membership.

H_1: There is significant relationship between efficiency levels of farm resource utilization and years of cooperative membership.

4.H_0: There is no significant relationship between profitability on sales of farm products and years of cooperative membership.

H_1: There is significant relationship between profitability on sales of farm products and years of cooperative membership.

5.H_0: Farm profitability of farmers is not significantly influenced by socio-economic characteristics of the member.

H_1: Farm profitability of farmers is significantly influenced by socio-economic characteristics of the member.

6.H_0: There is no significant relationship between perceptions of members on the contributory role of cooperative on agricultural production and years of cooperative membership.

H_1: There is significant relationship between perceptions of members on the contributory role of cooperative on agricultural production and years of cooperative membership.

1.6 Significance of the Study

This result of this study will help to improve agricultural production, as well as in the growth of knowledge in the following ways; Farmers will understand the need to form and stay long in cooperative societies, the benefits of cooperative societies will motivate the farmers to form societies. The diverse needs of students, academics, policy makers will be given attention. For students, this work will pool together and provide them with disparate strands of thought and authoritative educational material in rural development. For academics, it will contribute to agricultural development debate, and provide further scholarly information. For policy makers and development officials, the works will augment the data base and scholarly directions for effective agricultural development policy and action. The cooperators will benefits as it informs them on how to improve their economic activities. This study will also form literature for further studies.

1.7 Scope of the Study

As the title reveals, this research work deals with the effect of agricultural cooperatives on agricultural production in 2014. Thus, it is essentially targeted at determining the contributions of cooperative to the agricultural crop production process. This will be at two levels of analysis: society and member levels.

The study hopes to find out influence of core agricultural cooperative functions such as farm input supply, credit delivery, marketing, processing, and agricultural extension on farm output. The study being a cross sectional one is intended to cover socio-economic and farm data of cooperatives and members in 2014

1.8 Limitations of the Study

In the process of collection of data, the researcher had a lot of problems and they curtailed the availability of information. The most outstanding problems encountered by the researcher were as follows:

1. Location of places to visit, some of the offices and ministries were a bit difficult.
2. Co-operation with the management committee went well, as they were convinced of the need for this research work but some of the questionnaires were not correctly filled and returned.

All these aforementioned would have had a good limitation on the outcome of this work, but despite that the researcher went at great length to surmount them and to make profitable academic contributions.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

The researcher reviewed some related literatures under the following sub-headings;

2.1 The Concept of Cooperative formation

According to Frederick, (1999), "a cooperative is a user-owned and democratically-controlled business in which benefits are received in proportion to use". Another definition from the University Of Wisconsin Center for cooperatives has it that "a cooperative is a business, voluntarily-owned and controlled by its member patrons and operated for them and by them on a non-profit or cost basis. It is owned by the people who use it". A key element in the above two definitions is the members dual, nature – they are owners and users, investors and patrons. It is this dual nature of the members that differentiates the cooperative from other organizations. Accordingly, Hansmann (1996) noted that while political parties, service clubs or lobby groups, for instance, are voluntary associations created to provide their members with benefits, it is only in cooperative that the members actively use or purchase the good or service provided by the organization that they themselves have created. Similarly, the dual nature of the

members is what differentiates a cooperative from a publicly traded corporation. While some investors may purchase the product supplied by the company in which they have invested, it is the investor relationship and not the user relationship that investors have in common.

According to Ofuebe, (1992), the “cooperative” is one of the most effective vehicles for organizing modernized rural production which has become one of the most important preconditions for efficient mobilization of production resources and accelerated rural progress. This importance arises from the fact that the small-scale individual proprietary structure of peasant production can no longer cope effectively with technological and capital demands of modernized primary production. Even though the family farm may be considered efficient within the static framework of its motive of enterprise-self sufficiency, the dynamic demands of modern times are such that such a framework has to be subjected to drastic structural changes. And this, the peasant should be educated on so that he knows that his interest is being fostered. Ofuebe, (1992), citing Erdman and Tinley, (1957) defined a cooperative association as “a voluntary organization of persons with a common interest, formed and operated along democratic lines for the purpose of supplying services at cost to its members, who contribute both capital and business. This definition embraces the main features of a cooperative association. First, it is an association of people who come together of their own free will. Second, its members have a common interest as users of the goods and services provided by the association or as producers of the product sold. Third, it operates along democratic lines. Fourth, it performs services at cost, with any under-payment or overcharge distributed on the basis of patronage. And finally, cooperators contribute both capital and business.

2.1.1 Nature of Cooperative

Cooperatives use different approaches to reaching a common goal. Members work together to achieve goals that they would not be able to achieve individually. Some of the differences of cooperative are in overall purposes, how they operate in their governance, and how they are controlled. However, there are other differences and distinctive characteristics that set cooperatives apart from other types of businesses. These differences become apparent when attempting to define a cooperative. The United States Department of Agriculture (USAID) stresses three principles that differentiate cooperatives from other businesses:

1. The user-owner principle – the member-users own and provide the necessary financing;
2. The user-control principle – the member-users control the business;
3. The user benefit principle – the cooperative's purpose is to provide and distribute benefits to members based on their use. The first and the third principles speak directly to the members as owner and the user-the member. Both invest in the cooperative and benefit from the goods or services provided.

The second USAID principle ties the owner and user roles together, stressing that when members make an investment, they own a business that they control. In exercising this control, the members make decisions about how the investment will be used – e.g. how access to the benefits provided by the investment will be priced knowing that they are the users of the services. As noted by USAID (2001), the idea of the members as an investor and a user can be seen in every cooperative or cooperative – like organization. In day care cooperatives, for instance, members purchase assets and hire staff to provide a service – day care which they purchase. The revenue raised from providing this service is used to cover the cost of purchasing assets and hiring staff. Similarly, in a retail cooperative, the members purchase assets

and hire staff to provide products or service. The revenue from this sale is used to cover the costs of the retail activity. This same pattern is repeated over and over again in all the consumer cooperatives, whether they are insurance cooperative or credit unions. Although they appear to be different, the producer cooperative (agricultural processing cooperatives, worker-cooperative and cooperative farms), share this same investor-user relation. Members make an investment that, along with goods (e.g. unprocessed agricultural products) or service (e.g. labour) provided by the members, produces products/services can be sold. The revenue obtained from the sale of these products/services is then used to cover the investment costs, the operation costs and the payment to the members for the goods and services they provided.

The discussion above highlights the fact that cooperatives are businesses. They make investment, generate revenue and incur costs. One important feature of cooperatives that relates to their business nature is the manner in which excess revenue over costs are returned to the members. As businesses, cooperatives generate revenue – whether it is from the sale of goods and services to their members (and in many cases, non-members). In the case of the consumer cooperative, or from the sale of product/services that are produced with goods and services purchased from their members in the case of the producer cooperative. If this revenue exceeds the cost of providing the good or services, the cooperative is said to earn a profit. This profit is returned to members, typically on the basis of the amount of business that members do with the cooperative (USIAD,2001)

According to Abrahamsen, Mather, Barda and Kelly (1993), another aspect unique to cooperatives that defines how the member–owners (investors) receive returns on their capital investments is referred to as “limited return on equity capital”. Members form a cooperative to get a service such as source of production supplies, market for their products, or a specialized service. Regardless of the service provided

by the cooperative, members seek to get services and not a monetary return on their capital investment. Limiting the payment, if any, for members' capital used to operate cooperative supports the principle distributing benefits proportional to use. Returns to capital are subservient to the value of services received.

History and Purpose of Cooperatives in Nigeria

As noted by (Agbola, 2005), the Cooperative Movement in Nigeria dates back to **1935** following the enactment of the Cooperative Ordinance No. 6 of **1935** by the Colonial Administration. Earlier a Colonial Administrator, Mr. C.F. Strickland was sent to Nigeria from the Colonial Office in India to assess the potentials of the Cooperative form of business in Nigeria. Mr. Strickland gave an affirmative report, but also suggested a heavy dose of government control of Cooperative activities in Nigeria since, in his considered opinion, the indigenous population would be incapable of managing the Cooperative form of business. This report, including his views on the capacity of the indigenous population to manage Cooperatives, having been accepted by the Colonial government gave the foundation for pervasive involvement of government at all levels in Cooperative administration in Nigeria. After political pattern already set by policy of control of movement in Nigeria independence the regions, and later the States, followed the erstwhile colonial administration in pursuing deliberate cooperative activities. A little history of the Cooperative will give a clear picture of the point we are trying to make. When in 1967 the four regions were abolished, and Nigeria assumed a 12 State structure, the Federal Government took a wrong step by transferring the Cooperative Division in the Federal Ministry of Labour to the Lagos State Government (Ijere, 1979). That meant that Cooperative matters were no longer to be handled at the national level and as a national issue. However, in what appeared to be the correction of the mistake of 1967, the Federal Government through the instrument of the Cooperative Department Decree No. 5 of 1974 created a

new Cooperative Division in the Federal Ministry of Labour (Adeyeye, 1978). By Decree No. 28 of 1976 entitled "Cooperative and Social development (Transfer of Functions) Decree, "the Cooperative Division was transferred to a new Federal Ministry of Cooperatives and Supply. In 1979, barely three years later, the Federal Ministry of Cooperatives and supply was abrogated and Cooperative activities were decentralized into two separate Cooperative Departments; one in the Federal Ministry of Labour and productivity and the other in the Federal Ministry of Agriculture (Abdullahi, 1980). In 1997, there was another policy issued and the two Departments were merged into one Federal Department of Cooperatives which is presently in the Federal Ministry of Agriculture and Water Resources.

The following is a clear case of policy inconsistency and no other Federal agency has been so traumatized as Cooperatives. Each time the Cooperative Department moved from one Ministry to the other, important documents and files got lost creating avoidable information gaps here and there. Even as a federal agency, the government was not quite sure of what purpose Cooperative was to serve. This position was confirmed by the government's acceptance that although Cooperatives as a form of voluntary self-help organization was known in many parts of the country for several decades, it featured for the first time in the National Development Plan in the Third Plan (1975-1980). The Plan Document further added that this situation resulted in the slow progress of the Cooperative movement. In subsequent plans and government policies, Cooperatives were assigned peripheral roles and were always called upon for rescue missions after which they are dumped.

As an agency introduced by the colonial government to facilitate exploitation of the abundant agricultural raw materials of the Colony, the Cooperative movement *ab initio* did not have any local touch and was also devoid of any local initiative. All local initiatives were frustrated and the colonial model of Cooperative structure was

imposed. Because of this, the Cooperative movement has been unable to gain its independence having been tied inexorably to the apron strings of government. When in 1993, the Federal Ministry Government came up with the Cooperative Societies Decree No. 90, all the restrictive provisions were retained and the appointment of the Director of Cooperatives became a political rather than a professional issue. The Cooperative Policy document issued by the government in 2002 did not help matters because the document only made copious recommendations without putting in place concrete implementation strategies.

Till the Cooperative database being prepared by the Federal Department of Cooperatives is released, we still have to rely on the scanty statistics provided in the Cooperative Policy Document which shows that about 5 million households are participating in Cooperatives in Nigeria. This figure does not give us the exact number of persons participating in Cooperatives. Besides, participation in Cooperatives does not give a clear indication that people are benefiting from their Cooperatives.

In a recent study carried out by (Ojo, 2005) to ascertain the degree to which members of Cooperative societies have benefited from two institutions that are central to Cooperative development in Nigeria, some startling revelations were made. This study which dwells on the extent to which National Agriculture Cooperative and Rural Development Bank(NACRDB) and the Cooperative Colleges in Nigeria have rendered service to Cooperative societies in Nigeria was a nationwide study which covered the six geopolitical zones in the country. A simple measurement index called Benefit Index (DI) was developed and used to determine the level of access members of the Cooperative movement had to the services of the two agencies. For the NACRDB the BI was estimated by dividing the actual amount obtained as loan by amount applied for and multiplying by 100 over total membership. For instance, ***A fi/=… x 100 MAP x 7'M***

Where A = Amount actually obtained

MAP = Maximum amount applied for

TM = Total membership.

For cooperative Training Institutions we have that

Where Np = No. of persons trained

TM = Total membership available for training

The result showed that for the whole country, less than one percent of those Cooperative members who desired to borrow from NACRDB were able to borrow, while less than one percent of all Cooperative members who desired to be trained in the Cooperative Colleges were actually trained. The results of this study have very serious implications for the current situation of Cooperatives in Nigeria. If Cooperative societies do not have access to the two inputs that are most essential for their development namely, finance and education, then their situation is critical. Part of the recommendations arising from this study includes the establishment of College-cowheels programme to take training to members of Cooperative societies. This will make Cooperative education cheaper, more available and more accessible to Cooperative members.

In the case of finance, it was emphasized that until a truly Cooperative bank is established, Cooperative financing will continue to be a far cry from what is expected. Coming from a background of weak foundation and restrictive control, Cooperatives have not delivered enough services to members of the movement in particular and to the nation in general. There is, therefore, the need for elaborate reforms needed to position Cooperatives to become a key player in the economic reforms going on locally and globally. To propose such reforms, the first point of reference is the International Labour Conference recommendation concerning the promotion of

Cooperatives referred to as Recommendation 193. During its 90th Conference held in Geneva on the 3rd of June 2002, the ILO gave general guidelines for the promotion of Cooperatives. Item 3 of these recommendations emphasizes that promotion and strengthening of the identity of Cooperative should be encouraged on the basis of: Cooperative values of self help, self responsibility, democracy, equality, equity and solidarity; as well as ethical values of honesty, openness, social responsibility and caring for others; and cooperative principles as developed by the international Cooperative Movement comprising of voluntary and open membership; democratic member control, member economic participation, autonomy and independence; education training and information; cooperation among cooperatives; and concern for community.

Item 4 of the recommendations dwelt on measures that should be adopted to promote the potential of cooperatives in order to assist them and their membership to: create and develop income-generating activities and sustainable decent employment; develop human resource capacities and knowledge of the values, advantages and benefits of the cooperative movement through education and training; develop their business potentials, including entrepreneurial and managerial capacities. Strengthen their competitiveness, as well as gain access to markets and to institutional finance; increase savings and investment; improve social and economic well being, taking into account the need to eliminate all forms of discrimination contribute to sustainable human development; and establish and expand a viable and dynamic distinctive sector of the economy, which includes cooperatives, that responds to the social and economic needs of the people.

Cooperatives in Nigeria to benefit from the foregoing reforms as recommended the movement needs to be gradually released from the tight grip of government to the extent that government will only play the role of creating enabling environment for

Cooperative businesses to thrive. The first step is to put in place a new national Cooperative Policy with inputs from all stakeholders. This will be followed by a comprehensive review of the Cooperative law to remove all restrictive clauses and introduce new clauses that will be in tandem with the spirit and letter of the International Labour Organisation (ILO) Recommendation 193 aforementioned.

2.2 CONCEPT OF AGRICULTURAL COOPERATIVE EFFICIENCY

To position Cooperatives for economic reforms in Nigeria, the views of Levin, (2001) in a keynote speech presented during the 10th National Cooperative Congress of Costa Rica are very much relevant. He insists that Cooperatives must articulate appropriate responses to threats and opportunities arising from economic reforms (globalization). The eight points he raised to support this position are hereby adapted to suit the peculiar situation of the Cooperative movement in Nigeria.

1. **Strengthening Cooperative Identity**

Although the issue of demutualization is not yet a problem in our setting because of the strong cultural and social ties holding members of cooperative societies together in Nigeria, a time will come when continued economic reforms with much emphasis on capitalistic ownership of means of production might create divisive tendencies. Appropriate and timely Cooperative education is important to keep the Cooperative identity from being eroded. For instance, does the Law of Nigeria provide opportunity for Cooperative organizations to buy shares or even take over national monuments that are privatized in Nigeria? If no such laws exist, what can we do to ensure that Cooperative businesses do not lose out to individuals and individual enterprises (Agbola, 2005).

2. **Strengthening Member Services**

Cooperatives can only remain relevant if they offer sufficient and quality services to members. This is because the ties that link members with their Cooperatives are rooted in the quality of the services they receive and no amount of theorizing can substitute for this. Strengthening member services through successful cooperative entrepreneurship is, therefore, a precondition of Cooperative survival in an increasingly competitive market. Members are looking for new and innovative services, effectively and efficiently delivered, to answer their economic and social needs. Thus, qualified and competent leadership and management must be groomed to be able to deliver these services. Value-based professional management must not just be a well-meaning slogan but the cornerstone of everyday practice in Cooperative. Enough of blaming government for all the woes of the Cooperative business in Nigeria, Cooperative professionals should begin to establish successful Cooperatives as shining examples for others to follow (Agbola, 2005).

3. **Promoting Gender Equality**

Gender inequality has not been a very serious problem to Cooperative development in Nigeria. However, because the feminine gender form a good "Chunk" of Nigeria's population, any deliberate policy targeted at increasing women membership of Cooperatives in Nigeria will have a double positive effect of providing economic empowerment to both the Cooperative and the women members.

4. **Establishing Business Alliances**

One of the major weaknesses of the Cooperative movement in Nigeria is our failure to exploit abundant opportunities for intra and inter regional trade/business links. Because of the structure of Cooperatives in Nigeria, Cooperative activities tend to be compartmentalized with each state Cooperative movement minding its own territory. What is wrong in linking the Cooperatives in the South with those in the

North? What about considering alternative cooperative structures like regional structures cutting across States and joining together a whole region involved in producing one similar agricultural commodity? If these happen there is going to be a flurry of business activities among Cooperative societies across the country.

5. **Promoting e-commerce**

More and more businesses are now being conducted over the Internet with a number of very successful stories. “There are many websites dedicated to Cooperative activities. For instance the “Coop” suffix has been approved as top level domain by ICANN the Internal governing body. The “Coop” suffix opens up new marketing channels for cooperative products on a global scale.

6. **Social Alliance**

Economic reforms throw up a lot of social problems which Cooperatives can solve. If we get a little more innovative, a Cooperative can provide social services to members without actually infringing any Cooperative laws. What about Cooperatives getting interested in marriage ceremonies, burial ceremonies, title taking ceremonies and such other issues that affect the social lives of members?

7. **Image Promotion**

Cooperatives were wrongly packaged *ab initio* as government outfits. This identity has stuck to the movement leading to member apathy. A lot of image laundering and re-education is needed to present the Cooperative as a business entity first and foremost before any other consideration. Intense movement education is needed as can be provided through the earlier recommended College-on-Wheels programme.

8. **Lobbying for an Appropriate Legal and Regulatory Environment**

A lot of work needs to be done in this area. The government is comfortable with its overwhelming control of Cooperatives such that there is need for serious consultations and lobbying to make it change its attitude to Cooperatives. The Directors of Cooperative Services and other Cooperative staff, unless they are convinced about the need for reforms, may naturally work against any attempt to whittle down their control. Reforms may be silently undermined, tacitly delayed or obstructed unless they are convinced that reforms are in their overall interests. Cooperative professionals should stop sitting on the fence and blaming the government for all the woes of the movement in Nigeria. The time has come for constructive engagement with Cooperative administrators, Cooperative technocrats, Cooperative academics and the government of the day. The time is now for delay is dangerous. The Institute of Cooperative Professionals of Nigeria has taken the first bold step by bringing to the front burner the issue of positioning of Cooperatives for economic reforms in Nigeria.

The Concept of Agriculture

Agriculture (Farming) refers to the production of crops, animals, fisheries, forestry and wildlife products. However agribusiness/farm business refers to the production and distribution of farm supplies, physical production and processing and distribution of food and fiber, (Olayide et al, 1982).

Farm business provides food, employment opportunities, income, foreign exchange, raw materials for the local industries, enhances rural development etc. History has it that the early man started agriculture when he discovered that the seeds he discarded away germinated and grew into maturity. He then became conscious of farming, producing for himself and family (subsistence). Since then, farming has passed through stages in terms of development.

Initially development was slow probably due to low technology and more operating in a non-monitised economy – referred to as "Trade by Barter" it moved to the level of subsistence, plus a small traded surplus and there after got to the level of subsistence, plus a regular marketed surplus or plus part-time employment in industries. It has gotten to the stage of commercialization and modernization. Nigerian agriculture (farming), are incidentally in the hands of small-scale farmer. Basically labour-intensive and ultimately giving low output far not enough to satisfy the ever increasing population.

AGRICULTURAL DEVELOPMENT PROGRAMMES

Nigeria's quest for agricultural development involved the creation of the Federal Ministry of Agriculture in 1973, which was charged with developing agriculture. Successive governments in the country commenced various programmes to facilitate agricultural development. These programmes are:

(1) National Accelerated food production programme (NAFPP) of 1973.

(2) River Basin Development Authority (RBDA) of 1974

(3) Agricultural Developemnt Authority (ADP) of 1973

(4) Operation feed the Nation (OFN) of 1976

(5) Green Revolution Programme (GRP) of 1980

(6) Directorate of Food, Roads and Rural Infrastucture (DFRRI) of 1987

(7) Nigerian Agricultural Land Development Authority (NALDA) of 1992.

National Accelerated Food Production Programme

The NAFPP was inaugurated in 1973. It was designed to be an agricultural cooperative programme between the Federal Government, State Government and individual farmers in the States, with the aim of stimulating farmers to rapidly increase staple food production. Its specific objectives were to:

(i) develop a package of technology that farmers could adopt to achieve higher productivity.

(ii) develop an input delivery system through an integrated research/extension programme.

(iii) improve storage, marketing, credit supply and prices in such a way that both farmers and consumers are better off.

(iv) develop manpower to carry out the programmes. According to (Ojo, 2005), the basic strategy of the NAFPP was to use individual farmers to produce and multiply improved seeds for wider distribution among the farmers population. However, by 1985, the programme has become virtually incapacitated.

River Basins and Rural Development Authorities;

They perform the following functions:

* Provide irrigation facilities through construction of dams for all year round agricultural production.

* Provide portable water to the rural people for increased agricultural production.

* Assist to bring more land under cultivation by increasing the farm size of small-scale farmer e.g. Tractor hiring at minimum cost.

* Increase the total output per farmer with increased net revenue returns;

* Construct feeder roads to project sites for good transportation;
* Improve rural infrastructure generally, thus reducing rural urban migration;
* Construct fish ponds, to enhance the distribution of fingerlings to fish farmers, (Adegeye and Ditto, 1985)

Agricultural Development Project (ADP)

Their functions include:

* Boost agricultural production through the construction of farm service centers for efficient distribution of agricultural inputs.
* Establishment of rural infrastructures such as feeder roads and earth dams;
* Increased level of extension contact with people in rural areas;
* Source and make available farm inputs to farmers (eg) improved seeds, fertilizers, chemicals etc.
* Help in the reclamation of degraded agricultural lands. (Adegeye and Ditto, 1985).

Operation Feed the Nation (OFN)

The OFN had the following objectives:

(i) Total mobilization of the nation towards self sufficiency and self reliance in food.

(ii) Encourage the sector of our population which relies in buying food to grow their own food through schools, universities, military establishments etc.

(iii) Encourage general pride in agriculture through the realization that a nation which cannot feed itself cannot be proud.

(iv) Encourage balanced nutrition, thereby producing a healthy nation.

This programme made some achievements before its abolishment in 1980, especially in the mobilization and awakening of people's consciousness towards farming, increasing supply of agricultural inputs like seeds, fertilizers etc to the farmers, as well as increasing the quantity of food supply. However, critics of the programme describe it as a cash programme that was not systematically planned in support of set policies.

The Green Revolution

The objectives include:

(i) To increase food production and other raw materials to meet the needs of a growing population and rising industrial production with a basic goal for attaining self sufficiency in basic staples in about 5 years.

(ii) To increase production and processing of export crops with a view to expanding and diversifying the country's foreign exchanges with the aim of restoring our crop export capability in about 7 years.

(iii) To increase the production of livestock and fish to meet domestic needs and create a surplus for exports (Idachaba, 2005). Although its strategy was to accelerate agricultural development, it was also to enhance rural development. Unfortunately, it failed due to the fact that huge amount of money and other resources required to keep it afloat were diverted into private hands thereby frustrating the programme.

(iv) Contribute significantly towards the attainment of a national food and fibre self reliance, self-sufficiency and national food security through optimum utilization of available land resources.

(v) Facilitate appropriate effective mechanization agriculture. Although the objectives were laudable, NALDA could not fulfill its mission and unfortunately could not stand the test of time. Based on the foregoing, it was scrapped.

The failures of most of the agricultural programme, was largely due to the following: political instability, lack of finance, incompetent personnel to man the programmes, poor implementation strategies etc. It has to be noted here that in terms of prospects, the above stated problems have to be tackled.

The Young Farmers Club and Children-in-Agriculture are other agricultural programmes introduced.

Directorate of Food, Roads and Rural Infrastructures (DFRRI)

The present administration established this Directorate in 1986. The rural development policy will move away from past narrow sectoral preoccupation with the generation of food and fiber supplies to overall formulation of a national rural development strategy, with emphasis on the alleviation of rural poverty and the enhancement of the quality of rural life. The Directorate has established units in various States and Local Governments of the Country. It has been given the mandate of constructing thousands of kilometers of rural roads, as well as providing water for 5,000 rural communities. The Directorate (DFRRI) aims at mass participation of the rural dwellers in rural development. Its major programme areas are as follows:

(1) Organization and mobilization

- Community listing, authentication, codification, publication, etc
- Organization of the territorial space (regional planning) and political and economic development (development associations, cooperative societies, etc)
- Community development plans
- Community and social mobilization
- Community self help projects;
- Adult education and rural manpower development
- Private sector relations
- Rural health education and other health support programmes
- Home economics
- Information services, conferences, seminars, workshops, etc.
- Rural development data and collection and analysis.

(2) Provision of rural infrastructures

- Rural feeder roads, rural water and sanitation, rural electrification, rural housing, and other infrastructures, in collaboration with Federal, State, Local government councils, and the people through the development associations or organizations.

(3) Promotion of productive activities

- Food aid agriculture
- Rural industrialization

- Rural technology and resource development and exploitation

(4) Other programmes including socio-cultural and recreational programmes (promotional), grassroots sports development and promotion, intra and inter-community cohesion activities, performance, monitoring, and evaluation. Though the Directorate still exists till today, however, it had been restructured and renamed Directorate for Rural Development, thereby making it to abandon the cardinal objective of reserving the unsatisfactory trend in the nation's agricultural productivity for rural development programme only.

Nigeria Agricultural Land Development Authority (NALDA)

The NALDA was established as a measure towards agricultural development with the following objectives.

i. To provide strategic public support for agricultural land development in the country.

ii. To promote and support optimum utilization of Nigeria's rural land resources for accelerated production of food and fiber.

iii. Encourage and support economic size farm holdings and promote consolidation of scattered fragmented holdings to generate income from agriculture, which is aimed at sustaining living standards above the poverty line and thereby narrow rural urban income irregularities.

iv. Expand productive capacity in agriculture and regain export capability NALDA had been scrapped by the Federal Government for its inability to perform.

Farm Settlement Schemes:

Functions

* Reduce rate of unemployment among young school leavers and make farming attractive to youths;
* Settlers are taught better farming practices and hence produce larger farm produce for sale and for consumption;
* Rural areas developed infrastructural, thus making the farms more attractive to the dweller and reduce rural urban migration;
* The presence of the scheme has a multiplier effect as surrounding farmers visit them to learn new techniques/technologies of farming;
* Improved yields and harvest of the settlers contribute positively to higher GDP of the nation.
* It improves the efficiency of extension agents due to concentration of efforts and facilities.

Cooperative Farming

Functions:

* Farmers pool their resources together for better efficiency to attain higher productivity and income.
* Inputs are purchased in bulk by the cooperatives and then shared by the farmers;
* Farmers obtain short-term credit through the cooperatives at low interest rates which individual farmers cannot procure;
* Assist in the storage of their produce with attendant benefit;

* Assist in transportation of goods to markets hence ensuring better distribution and availability etc.

* Facilitate joint processing of agricultural products which reduces costs;

* It spreads risks among farmers in case of failure of farm products.

Private Sector's Participation in Agricultural Developemnt.

Private sector's participation in the agricultural sector dates back to the 18th Century, when Royal Niger Company (The Predecessor of United African company) commenced the trading in agricultural commodities such as groundnut, palm produce, cocoa, coffee etc. This brought about the establishment of the railway system for the evacuation of their produce to the sea ports in Lagos and Calabar where the produce are subsequently evacuated to Europe as industrial raw materials (Obinyan, 2000). Successive companies were involved in the development and marketing those major crops, this led to the establishment and marketing of those major crops. This led to the establishment of the commodities marketing Boards that were then taken over by the regional governments. Later, corporate bodies like UAC of Nigeria Plc, John Holt, Nigerian Breweries, Lever Brothers got involved directly or indirectly in the development, production and marketing sectors of the Nigerian Economy either as a backward integration effort or as support to the sector. Generally, the private sectors were involved in the areas of research, Extension, Finance, Inputs, policy formulation and infrastructural support specific activities of some private and NGOs in Agricultural development.

- The Shell Petroleum Development Company of Nigeria Ltd (SPDC) approach is to provide extension services to host communities in order to empower the farmers towards sustainable agricultural development. Objectives include:

- Help farmers grow from subsistence to commercial farming, thereby improving their standard of living.
- Encourage the growth of cooperative societies within the communities, thus providing a forum for team effort in solving common problems.
- Mobilize and complement the resources and effort of government agencies, research institutes and other organizations involved in agricultural production and education encourage the development of small-scale agro-industries in oil producing communities SPDC provides agricultural extension services to farmers in its area of operation in Rivers, Bayelsa, Imo, and Akwa Ibom.

GROWTH AND DEVELOPMENT OF AGRICULTURAL CO-OPERATIVE IN NIGERIA

According to Berko (2005), in the area of land acquisition, there are only few instances were co-operatives have acquired land for their members. This few instances have been cases were the River Basin Development Authorities, mainly and to some extent the erstwhile National Agricultural Land Development Authority (NALDA), have given land out to co-operatives. A case in point is the erstwhile World Bank Rice Project in Adani, Uzo-Uwani Local Government Area in Enugu State, which utilized the land, developed project which sadly could not be sustained and which collapsed some fifteen years ago. A similar project, but on a much wider scale was the Niger Delta Basin Development Authority. This authority developed land on which it organized co-operatives for various agricultural projects within River State now River and Bayelsa States. Owing to frequent policy changes, the agricultural projects through co-operatives have been dominated. In northern parts of the country, the Fadama lands are partly managed through co-operatives or Fadama User groups. The plots of land are found in contiguous whole, with the co-operative farmers being

supplied with irrigation facilities. The level of integration in the co-operatives is in some cases fairly high since other than the land management, certain production inputs are supplied to these farmers through the co-operatives which the farmers must belong to. The marketing is also in some cases done co-operatively, especially where inputs are supplied by agro-allied processing firms, and the co-operatives members-farmers are therefore their out growers.

In recent years, according to Berko (2005) more and more people want to go into agriculture but their ambition has been stalled because they have too little land or do not have land at all. Among such people are retirees, both civilian and military and retrenched workers. The author believes that some youths will be prepared to go into agriculture if land was readily available and a conducive environment prevailed. Land acquisition by co-operative in large scale is therefore, needed in this country to make it easier for acquisition of land, either from government or communities or individual landowners. Large expanse of land still lie idle in various communities and an appropriate institutional framework, especially through co-operatives is needed to put such lands under efficient cultivation. The ownership by government ignite fury and community strive ownership of their land and utilization.

In the area of mechanization, Berko (2005) noted that he is yet to come across co-operatives which are specifically formed to provide tractor or animal traction services. Small-scale farmers rely on government and private providers of farm machinery services, but usually own none at all. These farmers, therefore, spend huge sums of money to employ and costly manual labour to clear and prepare their farmlands for cultivation. This partly explains why our farmers still cultivate small holdings. For improved agricultural production, medium and large-scale farms are needed by bringing more and more land under cultivation. Our co-operatives have also not been able to organize members into animal traction co-operatives to minimize

the drudgery of farming. In the supply of farming implements, few co-operatives are involved. Co-operatives are, therefore, a failure in this area too (Berko, 2005).

As Berko (2005) further put it, the supply of production inputs to farmers through co-operatives, one would think, should have been a priority area of co-operatives. It would surprise many readers and observes that this is one of the neglected areas. Everyone talks of the adoption of improved and sustainable agriculture. Yet, there are hardly co-operative today which claim that they have done well in this area. In fact, there are only very few co-operatives today in Nigeria, either as single purpose or multipurpose societies which have supplied their members with improved variety of crops and/ or livestock since the last ten years or even longer. The exceptions are the Fadama land co-operatives. One is tempted, therefore, to ask (Berko), what these co-operatives have been doing.

In all States of the federation, with slight exception of the South-Western States and Bauchi and Gombe States, agricultural co-operatives have largely been a failure in carrying out the functions discussed above and even in other areas. This poor performance of agricultural co-operatives generally in Africa have been observed by Hussion et al (2004), cited in Berko (2001). As Chukwu (1990) as rightly observed, the poor performance of African co-operatives. Even in subsistence agriculture where farmers priorities lie, productivity has declined, and is unable to support the population so that food inputs, and the foreign-exchange drained has continued.

An ILO Cooperative reform document, cited in Berko (2005) expresses a similar view when it states in part: in several countries of the world, the term co-operative has acquired a negative connotation and many development expert are convinced that the era of co-operative development is over. This is the result of so

many disappointments with co-operative promotion in the developing world and elsewhere.

It is indeed not uncommon according to Berko (2005), to hear members of the general public, donor organizations, NGOs, politicians and even co-operative members themselves express concern about the unsatisfactory state of the national co-operative movement.

The ILO document, cited in Berko (2005) finally poses the question: why have so many co-operative organizations failed to live up to expectation? This poor impression about co-operative makes it often difficult also in this country to convince people that co-operative are veritable instruments for agricultural development and development generally. But they are!

2.3 CONCEPT OF AGRICULTURAL PRODUCTION

The purpose of this section is to identify and define core agricultural productivity related concepts, including measures of agricultural productivity, efficiency, and profitability, while also providing contextual information on the trends in agricultural productivity and related concepts in Nigeria.

Definition and measures of agricultural productivity

Agricultural productivity refers to the output produced by a given level of input(s) in the agricultural sector of a given economy (Fulginiti and Perrin, 1998). More formally, it can be defined as the ratio of the value of total farm outputs to the value of total inputs used in farm production.

Agricultural productivity is measured as the ratio of final output, in appropriate units, to some measure of inputs. However, measures of productivity can be divided into partial or total measures depending on the number of inputs under consideration.

Total output as a ratio of some measure of labor quantity, usually man days in developing countries, is called labor productivity (LP) and provides some notion of output per worker, while output per area of land planted is land productivity (Wiebe 2003; Zepeda, 2001). The two previously mentioned measures are examples of single factor productivity (SFP), defined as the ratio of a measure of output quantity to the quantity of a single input used (Diewert and Nakamura, 2005). Partial measures of productivity can be misleading because they ignore the role of other inputs in any observed output changes (Zepeda, 2001). As a result of this shortcoming, a total measure of productivity was developed. Total factor productivity (TFP) is defined as the ratio of a measure of total output quantity to a measure of the quantity of total input (Wiebe 2003; Zepeda, 2001).

Agriculture plays a major role in the economy of many developing countries, as it is a significant source of nourishment for citizens and a means of livelihood for the most vulnerable members of these countries. As a consequence, raising agricultural productivity is an important policy goal for concerned governments and development agencies.

Increasing agricultural productivity requires one or more of the following: an increase in output and input with output increasing proportionately more than inputs; an increase in output while inputs remain the same; a decrease in both output and input with input decreasing more; or decreasing input while output remains the same (Adewuyi, 2006).

Increasing inputs in order to expand output involves raising both the quality and quantity of inputs, examples of which would include the mechanization of agricultural processes, use of high yield varieties, use of fertilizers, irrigation in areas where rainfall is inadequate, and the use of agrochemicals such as herbicides and pesticides. Though all of the aforementioned activities have the potential for productivity

enhancement, smallholder farmers, who account for the vast majority of farmers in developing countries, often cannot afford these investments due to their limited resources and restricted access to credit.

Efficiency; There is a large literature on the need to increase the quantity and quality of inputs in agriculture in developing countries, as well as the need to increase access to resources to finance these inputs. However, it is also possible to increase output even given current levels and quality of inputs by increasing overall economic efficiency of farmers (Bravo-Ureta and Pinheiro, 1997). The concept of efficiency is critical in developing country agriculture. Given the level and quality of inputs available, how well farmers are able to utilize these inputs is an important determinant of the quantity of output they are able to produce. Recent measurement of farmer efficiency has been based on the seminal paper by Farrell, (1957), who decomposed economic efficiency into its technical and locative components.

Technical efficiency refers to the ability of a producing unit to obtain maximum (optimal) output from a given amount of inputs. Formally, the level of technical efficiency is measured by the distance of farm production from the optimal production frontier. A firm that sits on the production frontier is said to be technically efficient (Henderson 2003). Allocative (or price) efficiency refers to the ability of the firm to choose its inputs in a cost-minimizing manner (Murillo-Zamorano 2004; Chavas and Aliber, 1993). For allocative efficiency to hold, farmers must equalize their marginal returns with true factor market prices. Thus, technical inefficiency is related to deviations from the frontier isoquant, while allocative inefficiency reflects deviations from the minimum cost input ratios (Bravo-Ureta and Pinheiro, 1997).

In addition to technical and allocative efficiency, Farrell(1957) also defined the concept of overall efficiency (renamed economic efficiency by later literature). Economic efficiency refers to “the capacity of a firm to produce a predetermined

quantity of output at minimum cost for a given level of technology" (Farrell 1957) and is derived by multiplying the technical and allocative components of efficiency (Bravo-Ureta and Pinheiro, 1997). All three measures are bounded between zero and one (Murillo-Zamorano, 2004). Parametric and non-parametric methods are often utilized to measure economic efficiency. The most common specifications are the Stochastic Frontier models, which have been extensively specified in Nigeria for a wide variety of crops (Ajibefun 1998: Fasoranti, 2006; Amos, Chikwendu, and Madu, 2004; Adejoh, 2009; Ojo, 2009). Parametric methods assume that the functional form of the production function is known, while non-parametric methods do away with the restrictive functional form assumptions, instead relying on the data to specify the production frontier. Data envelope analysis models are the most commonly used forms of non-parametric models (Ajibefun, 2008). Using either methodology (parametric or non-parametric), it is possible to estimate technical efficiency and allocative efficiency for each observation in the dataset. Most studies report mean levels of technical and allocative efficiency for the sample under observation. Studies that have applied both methodologies report no substantive differences in estimates of efficiency (Ajibefun, 2008).

Trends in agricultural production in Nigeria

Nigeria is the most populous country in Africa with about 140 million citizens. Approximately half of them, or 70 million, are rural dwellers. Most rural residents are engaged in smallholder semi-subsistence agriculture (Oviasogie, 2005; Ajibolade, 2005). Therefore, agriculture remains a crucial sector in the Nigerian economy, being a major source of raw materials, as well as food and foreign exchange, employing over 70 percent of the Nigerian labor force, and serving as a potential vehicle for diversifying the Nigerian economy and enabling economic development.

Before the emergence of oil as Nigeria's dominant economic sector, the agricultural sector contributed over 60 percent of Gross Domestic Product (GDP) and 90 percent of exports (UNDP, 2009). The economic relevance of the agricultural sector has since declined, with the share of agriculture in GDP falling to 32.2 percent in the 1975-1979 period (Adewuyi, 2002) and averaging 35 percent between 1981 and 2006 (Figure 1). The fall of agriculture in export share has been even more precipitous. From 1960-1970, the export crop subsector contributed 58.4 percent annually on average to the total foreign exchange revenue. This declined to 5.2 percent over the period 1971-85 and then further to 3 percent from 1995-1999 (Adewuyi, 2002). Similarly, the growth of output in the agricultural sector declined from 3.8 percent in the 1987-1990 periods to 2.2 percent between 1992-1995 (Adewuyi, 2002). Within the 23 years from 1981 to 2003, aggregate agricultural production grew by only 5.4% (Muhammed-Lawal and Atte, 2006). As a result of this slow growth in output, Nigeria moved from a food sufficient country in the 1960s to a major importer of food in the 1980s (Fasoranti, 2006). The estimated current 3.7 percent food production growth rate cannot keep pace with the 6.5 percent food demand fueled by a high rate of population increase, moderately rapid income growth, and relatively high elasticities of expenditure for food (Egwuda, 2001; Oviasogie, 2005; Mellor, 1988). For instance, in 2004, local demand of five million tones of rice far outstripped the supply of three million tones, necessitating the importation of rice to meet the shortfall. The value of rice imports has continually increased from $60 million in 1990 to $280 million in 2001, peaking at over $1 billion in 2008 (Akintayo, 2011). In 2002, Nigeria was one of the six largest rice importers in the world (Yusuf, 2009). As with most other crops in Nigeria, rice yields are low, averaging about 1.8 tones of paddy per hectare, compared to national potential average of 3 tones per hectare for upland system and 5 tones per hectare for the lowland system (Akintayo 2011). In general, food crop production in Nigeria is far below potential and demand is greater than locally produced supply.

Figure 2 presents the trends in outputs of selected crops (millet, yam, maize, cassava, and rice) for the period (2005/06). Output produced for most crops was stagnant or declining, with the exception of cassava, which saw modest increases in output. However, land area cultivated for these crops followed a similar trend remaining stagnant or modestly increasing over the period (Figure 3). Similarly, with the exception of cassava, which witnessed modest increases, land productivity was either declining or static (Figure 4).

Figure 1 – Contribution of selected sectors to Nigeria's GDP, 1981 to 2006

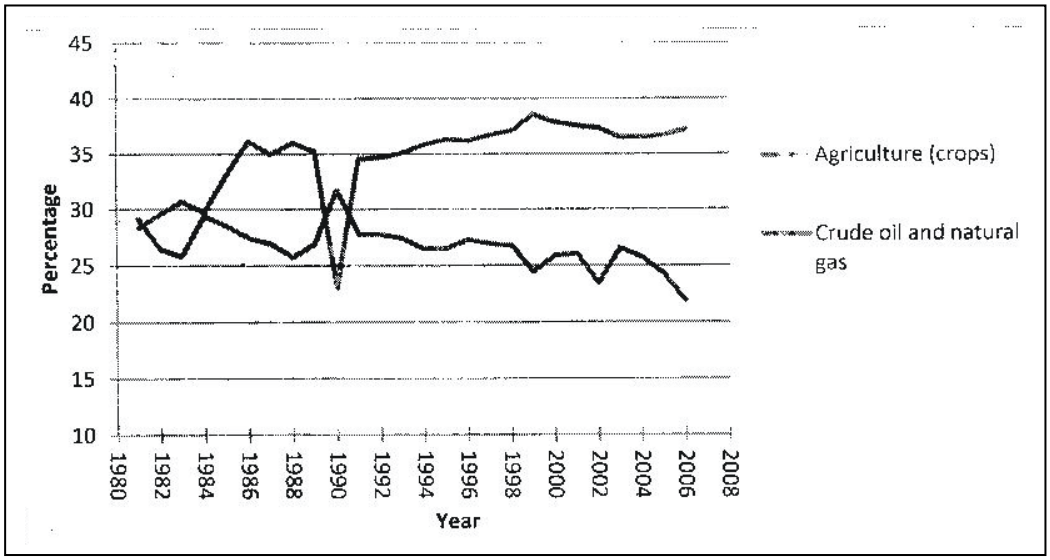
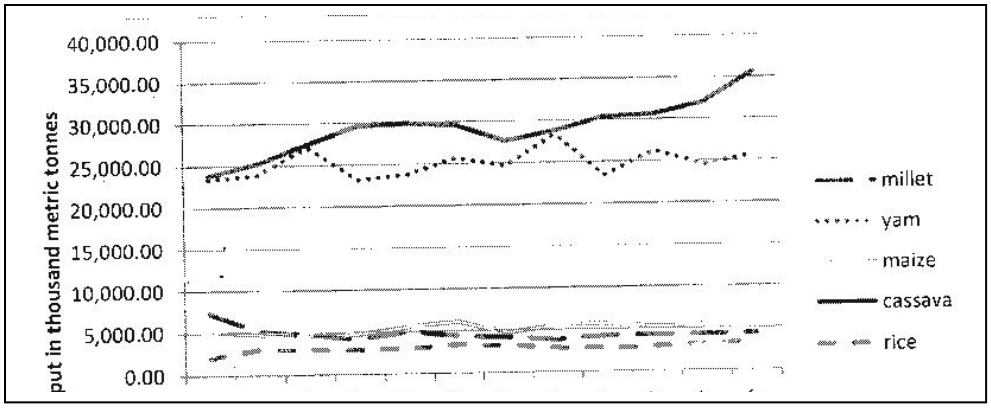


Figure 2-Trends in outputs of selected crops, 1994/95 to 2005/06



Source: NBS 2009a

Farm households and agricultural productivity

The issues that determine the levels of agricultural productivity attained by farm households in developing countries are multidimensional and complex. Following the categorizations devised by Hussain and Perera (2004), the constraints and opportunities for agricultural productivity in Nigeria are identified below:

1. **Land and water related factors:** For many farmers in the South-South region of the country, pollution due to petroleum exploration is a major issue that has important implications for the quality of land and water (Idumah, 2006). Farmers in this region frequently have to increase their input use, particularly fertilizer, while having to settle for suboptimal output levels and lower revenues despite the higher input costs (Idumah, 2006). Idumah (2006) in a study of food crop farmers in two States of the South-South revealed that soil degradation effects arising from the combined effects of oil pollution and other soil related issues like flooding accounted for about 21 percent of the difference in farm revenue between polluted and non-polluted farms. There are problems with soil quality in other regions of the country as well. Farmers in the Northern states of the country have to contend with the threat of desert encroachment (Akinyosoye, 2000) while Southern soils are often low in nutrients arising from long exposure to sunshine and rain, leading to erosion problems (Akinyosoye, 2000; Adejoh, 2009).
2. **Climatic factors:** The implications of climate change for agriculture are also a major concern in Nigeria. Desert encroachment due to unpredictable and extreme weather associated with climate change reduces the production possibilities of rural farmers by drastically reducing the available cultivable land. Currently, desert encroachment threatens about 35 percent of Nigeria's landmass (NISER 2010). Consequently, farmers in northern Nigeria are facing

accelerated desertification due to limited rains and shrinking water sources. For instance, from a peak of 25,000km^2 in the 1960s, Lake Chad has shrunk to approximately 1,000km^2 today, due to drastically reduced precipitation and an increase in irrigation demands by surrounding farmers (Coe and Foley, 2001). Similarly, farmers in southern Nigeria face several challenges. While some face the late onset of rains, early cessation of rain, shortened length of the rainy season, and reduced annual amount of rain (Adewuyi, 2002), others experience increased flooding due to excessive precipitation (Egwuda, 2001)

c) Agronomic factors: A large variety of studies in different regions of the country have identified the scarcity and high cost of inputs (labor, agrochemicals, and fertilizer) as major impediments to raising the productivity of smallholder farmers (Egwuda, 2001; Ojo, 2005; Adejoh, 2009; Peke, 2008). Other related problems include the difficulty in maintaining seed quality due to susceptibility to disease, perishability, and the low multiplication rate of seeds (Ojo, 2005; Adejoh, 2009). In addition, low skilled and poorly educated family labor is the primary factor of production, often supplemented by hired labor is also combined with mostly rudimentary tools such as hoes and cutlasses and ox-drawn ploughs in some parts of Northern Nigeria (Baiyegunhi, 2003). Farming methods are also basic (Ogunsanya, 2009; Ajani, 2000; Akintayo, 2011; Oladeebo, 2006; Fasoranti, 2006; Ajibolade, 2005; Peke, 2008; Fanegan, 2010; Oviasogie, 2005), as mechanization of farm processes is rare (Ogunsanya, 2009; Adeyemo, Oke and Akinola, 2010; Ajani, 2000).

d) Farm management factors: In addition to crude farm implements, production technologies in Nigeria are often substandard and farming methods outdated. Also, common practices like bush burning tend to destroy soil and plant quality (Adewuyi, 2002; Oseni, 2001). Mixed cropping is commonly practiced in many regions of the country (Ajibolade, 2005; Ajibefun, 1998; Akintayo, 2011; Adejoh, 2009; Idumah,

2006). Adewuyi's 2002 study of food crop farming in Kwara State revealed the dominance of sole cropping (68% of cultivated area) in the region covered by the study. Deriving optimal productivity from a crop often depends on the cropping pattern utilized. For instance, mixed cropping was more productive than sole cropping for maize farmers in Niger State where the Yam/maize mix yielded better returns than sole maize (Amos, Chikwendu, and Nmadu, 2004). Similar results were found for yam farmers in Edo State (Oviasogie, 2005).

e) Poor supporting infrastructure: These include inadequate storage and marketing facilities, inadequate extension services, poorly organized rural input, output and financial markets, and substandard rural infrastructure. Many farmers report limited contact with extension agents and consequently receive no information on improved production technologies and practices (Adejoh, 2009). For instance Egwuda's 2001 study of Lowland rice production in Kogi State revealed the complete absence of extension services in the region. Other challenges include poor feeder roads and limited access to clean potable water, good health services, electricity, telephone and educational facilities. These are factors of productivity incentives for farmers (Fasoranti, 2006; Okafor, 2004; Adewuyi and Okunmadewa, 2001; Yusuf, 2009; 2008; Adewuyi, 2006; Adejoh, 2009).

f) Socio-economic factors: In Nigeria, small-scale, resource-poor farmers, the majority of who are engaged in subsistence or near subsistence farming, produce the majority of aggregate agricultural output via rudimentary farming systems (Oviasogie, 2005; Ajibolade, 2005). Farm holdings across Nigeria are generally small with less than 5 hectares on average and are often inherited rather than purchased (Adeyemo, Oke and Akinola 2010; Akintayo 2011; Oladeebo 2006; Adewuyi 2002; Egwuda 2001; Ojo, 2005; Ekunwe, Orewa, and Emokaro, 2008; Adejoh, 2009; Oviasogie, 2005, Haruna, 2009, David et al. 2009; Yaro, 1999). However, Baiyegunhi(2003)

found that Sorghum farmers in Kaduna State resorted to buying or renting more land to augment their farm holdings. Fragmentation of farm holdings is also an issue, as farmers often have more than one location for their farms due to factors like variation in soil fertility and accessibility to land (Abubakar, 2006; Adewuyi, 2002; Okafor, 2004, Akinyosoy, 2000). While a study of small-scale food crop farmers in the South-South (Idumah 2006) also revealed small land holdings with an average of 1.56 (hectares), most respondents farmed on communal land and leased land.

Incomes from farming are generally low. Consequently, many farmers engage in other occupations to supplement their incomes such as hunting, trading, crafts, and fishing (Adewuyi, 2002; Ogunsanya, 2009; Ajani, 2000; Ojo, 2005; Yaro, 1999). Many farmers also face limited access to credit facilities due to high interest rates and lack of collateral and often have to rely on personal founds or loans from friends and relatives to fund any farm expenses (Oladebo, 2006; Adewuyi, 2002; Egwuda, 2001; Adejoh, 2009).

In terms of demographics, the average farm household head/farmer is middle aged, poorly educated (primary school or less), male, married, and has been farming for both subsistence and commercial purposes for ten years or more (Ogunsanya, 2009; Ajani, 2000; Akintayo, 2011; Oladeebo, 2006; Fasoranti, 2006; Ajibolade, 2005; Peke, 2008; Fanegan, 2010; Adeyemo, Oke and Akinola, 2010; Oluwatayo, Sekumade and Adesoji, 2008; Adewuyi 2002; Olawepo, 2010; Egwuda, 2001; Ojo, 2005; Ekunwe, Orewa, Emokaro, 2008), Adejoh, 2009; Oviasogie, 2005; David. 2009; Abubakar, 2006; Abubakar, 2010). However, many famers in the northern part of the country acquire Islamic/Quranic education in lieu of western education (Baiyegunhi, 2003; Haruna, 2009; Yaro 1999; Abubakar, 2006). There are some exceptions. For instance, Idumah's 2006 study of food crop farmers in the South-South revealed that over half of the sample acquired post primary education. Average household sizes are

large (7–12 persons on average) as households are the primary sources for farm labor, (Ogunsanya, 2009; Ajani, 2000; Akintayo, 2011; Olawepo, 2010; Egwuda, 2001; Ekunwe, Orewa, Emokaro, 2008; Adejoh, 2009; Oviasogie, 2005; Baiyegunhi, 2003; David, 2009; Idumah, 2006).

The previously mentioned factors combine to create a situation of low agricultural productivity. They create a production structure dominated by barely literate subsistence and semi-subsistence smallholders who cultivate no more than 5 hectares, with poor access and limited ability and willingness to adopt production-enhancing inputs such as improved seeds, fertilizer and irrigation. Farmers are dependent on labor-intensive, low input-output technologies and often face high levels of post-harvest losses due to poor handing, inadequate development of agro-processing, as well as poor rural infrastructure, particularly rural roads and storage facilities, and limited access to marketing opportunities (Fasoranti 2006; Okafor 2004; Ekunwe, Orewa and Emokaro, 2008; Adejoh, 2009).

g) Policy-related factors: There have been several attempts by the Federal Government to create programs to improve agricultural productivity in Nigeria; many of which are developed with the aid and inputs of international organizations. Agriculture specific programs that have been implemented include Agricultural and Cooperative Bank (1973); National Accelerated Food Rural Development Authorities (1976); Operation Feed the Nation (OFN) (1976); Agricultural Rural Programme (ARP), (1979/1980); and the Cassava Multiplication Program (1985 - 1999). Several institutions were also set up in order to facilitate these programs including the Agricultural Credit Gaurantee Scheme (ACGS); Rural Banking Scheme (RBS); Nigeria Agricultural Insurance Company (1984); Directorate for Food, Roads and Rural Infrastructure (DFRRI) (1986); Nigerian Agricultural Development Bank

(NADB); and the National Agricultural Land Development Authority (NALDA) (1991) (Adewuyi, 2002; Okafor, 2004).

Many of these initiatives were not successful because they were ad hoc programs that lacked focus. They were poorly conceived and implemented and were duplicates of already existing programs and organizations (Fasoranti, 2006). In addition, government policy was inconsistent and projects were improperly monitored and implemented (Okafor, 2004; Adewuyi, 2002). Also in existence was an unfriendly macroeconomic policy environment characterized by an overvalued exchange rate, a mismanaged subsidy regime and bad export crop pricing schedules (Adewuyi and Okunmadewa, 2001). This environment encouraged imports at the expense of local crops, which led to crowding out of local production (Yusuf, 2009, Adewuyi, 2002; Zakari, 1997, Muhammad-Lawal and Atte, 2006). Several food crops (particularly tubers) were also neglected in favor of cash crops, while government invested very little funding in support of agricultural-related research. More recent programs created to improve agricultural productivity include several presidential initiatives on selected crops (rice, cassava, vegetable oil); Root and Tuber Expansion Program (RTEP); the National Special Program on food security (NSPFS);

Community-Based Agriculture and Rural Development Project (CBARDP); various phases of the National Fadama Development Program (NFDP), amongst several other efforts. There is preliminary evidence that some of these programs are improving productivity of farmers by encouraging technology adoption and expanding farmer access to inputs, credit, and extension services (Olawepo, 2010; Abubakar, 2010). Assessment of the impact of these programs is ongoing (Oruonye, 2011; IFAD, 2009).

Agricultural productivity in Nigeria

Nigeria is comprised of 36 States and the Federal Capital Territory (Abuja), which are further categorized into six geopolitical regions namely the South-West, South-East, South-South, North-Central, North-West, and North-East regions (Table 2). The North West region, with a population of 36 million, contains the highest proportion of Nigerians with 25 percent, while the South-East is the least populated with 9.7 percent. The country also has a very diverse agro ecology characterized by numerous farming systems, including Pastoral, Agro-Pastoral (millet/sorghum), Irrigated, Cereal-Root Crop Mix, Highland Temperate Mix, Root Crop, Tree Crop, and Coastal Artesian Fishing (FAO, 2001). In addition, as many as seven major agro ecological zones exist within Nigeria's geographical confines. These zones cut across the six geopolitical regions (as revealed in Table 1) and include:

1. The mangrove swamp, which characterizes the coastal areas of the Delta region, and is not widely cultivated except for swamp rice and fish.
2. The tropical rain forest made up of the eastern, central, and western rain forest in the States of Ogun, Ondo, Oyo, Edo, Ekiti, Imo, Anambra, and Cross Rivers. Root crops such as cassava, yams, and potatoes are also extensively cultivated.
3. The Savannah zone comprising the middle belt region including Kwara, Benue, Niger, Adamawa, and Taraba States. Main crops are cereals, roots, tubers, cotton and groundnuts.
4. The guinea savannah zone comprising the Southern parts of Sokoto, Kaduna, Katsina, Bauchi, and Borno States. Main crops are groundnuts, cotton, sorghum, millet, and rice.
5. The dry savannah which covers the northern parts of Kano, Bauchi and Borno States with the most common crops being groundnuts, sorghum, millet, cowpeas and livestock (Fasoranti, 2006; Sowunmi and Akintola, 2010).

Table 1 – NIGERIAN AGRO ECOLOGICAL ZONES BY REGION

Region	States	Population	Agro ecological zones	Major crops
North Central	Benue, FCT, Kogi, kwara, Nasarawa, Niger, Plateau	20.4	Derived savannah, Southern Guinea Savannah, Woodland and tall grass savannah.	Maize, Rice, Groundnut, Yam, Soya beans, etc.
North East	Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe	19.0	Northern guinea, savannah, Southern Guinea savannah, Sudan Savannah, Marginal savannah, short grass savannah and montane.	Cowpea, Sorghum, Millet, Groundnut, etc.
North West	Kaduna, katsina, Kano, Kebbi, Sokoto, Jigawa.	35.9	Southern Guinea savannah, Sudan savannah, Sahel savannah and short grass savannah.	Cotton, Sorghum, Millet, Soya beans, Cowpea, etc.
South East	Abia, Anambra, Ebonyi, Enugu, Imo	13. 5	High forest, Derived savannah, Woodland and tall grass savannah and rainforest.	Cassava, Oil Palm, Cocoyam, Melon, Rice, etc.
South south	Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo, Rivers.	21.0	High forest, Derived savannah, Mangrove and fresh water swamp.	Yam, Maize, Cassava, Melon, etc.
South West	Ekiti, Lagos, Osun, Ondo,Ogun, and Oyo	27.7	Derived savannah, rainforest and Mangrove	Maize, Yam, Cassava, Cocoyam, Melon, etc.
Nigeria	36 states + FCT	140.4		

Performance indicators on the Nigerian farming sector.(FAO, 2001)

Efficiency

Levels of efficiency including Technical Efficiency (TE), Allocative Efficiency (AE) and Economic Efficiency (EE) and productivity differ by crop, location, and cropping system. Table 2 provides available estimates of different measures of efficiency for all six socio-political regions. While there are exceptions, Nigerian farmers across all regions are below their production frontiers and consequently the opportunity exists to increase their productivity above existing levels, even given their current levels of inputs.

South-West

Some studies report very high levels of efficiency given the available technology and input quality. For instance, Fasoranti's (2006) TE study of cassava farms in Ondo State revealed mean TE values ranging from 0.85 to 0.98, with the figures implying the superiority of mixed cropping in cassava production. AE values were similarly high, ranging from 0.82 (cassava sole cropping), to 0.93 (cassava plus maize). Oladebo (2006) also estimated similarly impressive levels of efficiency in the production of rain-fed upland rice in Osun and Oyo States with mean TE and AE estimates of over 0.90 and mean EE levels of over 0.80 in both States. Levels of efficiency of these rice farmers were comparable to those derived in other settings for upland rice production (Oladeebo, 2006). Adeyemo, Oke, and Akinola (2010) also reported high levels of technical efficiency by small-scale cassava farmers in one local government in Ogun State. TE level ranged from 0.86 to 1, with a mean of 0.89.

However, there are other crops and settings for which efficiency could be greatly improved. Ajibefun (1998) provided agricultural zones in Ondo State. Mean TE in Akure zone was 0.66, mean TE in Ondo zone was 0.56, mean TE in Akoko was 0.57, while mean TE in Owo zone was 0.61. He also provided values for the mean levels of AE, which were 0.71 (Akure zone), 0.60 (Ondo), while Akoko and Owo had 0.66

respectively. Mean values of economic efficiency were Akure (0.5), Ondo (0.35), Akoko (0.44), and Owo (0.42).

The authors also computed values of the different efficiency components using non-parametric methods, specifically data envelope analysis, for comparison and derived similar results. Mean TE in Akure was (0.6), Ondo (0.53), Akoko (0.58), and Owo (0.59). Mean AE was Akure (0.660, Ondo (0.56), Akoko (0.61), and Owo (0.60). Combining the two measures to compute EE, mean EE ranged from 0.33 in Ondo to 0.44 in Akure.

In Ekiti, Oluwatayo, Sekumade, and Adesojis' (2008) study of maize farmers revealed a mean TE of 0.68. Oluwatosin's (2011) study of yam farmers in Osun State reported TEs ranging from 0.343-0.962 with mean 0.698, while Ogunniyi's (2011) study of leafy vegetable farmers in Oyo State produced a mean EE score of only 0.42.

North-Central

Available studies in this region also reveal differences in estimated levels of efficiency by crop, cropping system, and location. Amos, Chikwendu, and Nmadu (2004) studied small-scale food farmers in Niger State and revealed that the TE of sole maize cropping was 0.53, while the TE for yam/maize cropping was 0.72. Overall TE for all crops was 0.62. Mixed cropping was evidently superior to sole cropping, as over 50% of mixed crop farmers had TE cropping was evidently superior to sole cropping, as over 50% of mixed crop farmers had TE values exceeding 0.70, compared to 100% of sole farmers who had TEs less than 0.60. Adejoh (2009) studied yam farmers in Kogi State and reported a TE of 0.73, while Ekunwe, Orewa and Emokaro (2009) also studied yam farmers in Kogi State and reported a TE of 0.73, while Ekunwe, Orewa and Emokaro (2008) reported a lower TE of 0.65 among yam farmers in Kogi. In this study, TE values ranged from 0.2 to 0.95 and only 23 percent of farmers had TE

greater than 0.8. Ojo, (2009) also studied yam farmers, this time in Niger state, and reported a TE ranging from 0.3 to 0.95 with a mean of 0.75. According to Shehu, (2010), the most technically efficient yam farmers in the North-Central region are in Benue State, as estimated TE values ranged from 0.67 to 0.99 with average TE levels of 0.95. Finally, Otitoju and Aren's 2010 study of soybean farmers in Benue State revealed a mean TE of 0.73.

South

Ebong, Ukoro, and Effiong (2009) in their study of food crop farmers in Akwa Ibom revealed TE values that range between 0.1 and 0.95 with mean of 0.81. Ekunwe, Orewa and Emokaro, (2008) reported high average levels of TE for yam farmers in Delta State with a mean TE of 0.85 and about 80 percent of farmers with TE exceeding 0.8. Idiong, (2009) also reported high mean levels of TE for rice farmers in Cross River. Mean TE was 0.7 for swamp rice and 0.87 for upland rice. Economic efficiency was, however, much lower, having values of 0.17 (swamp rice) and 0.22 (upland rice). Oviasogie, (2005) examined the mean TE for four different cropping patterns of yam in Edo State. Mean TE for sole yam was 0.84, yam/maize mixture was 0.59, yam/groundnut mixture was 0.39, while mean TE for yam/maize/melon/cassava mixture was 0.24. TE reduced with the increase in the number of crops due largely to interaction effects for nutrients, water, and light among competing crops in the yam-based cropping pattern. Idumah, (2006) examined the impacts of pollution on efficiency of small food crop farmer in two States of the South and found that pollution reduced TE and overall efficiency. TE with pollution was 0.78 compared to 0.88 in the absence of pollution, while EE with pollution was 0.68 compared to 0.72 for farmers who did not have polluted farmlands.

South-East

Raphael's (2008) study of cassava farmers in the two South-East States of Abia and Imo revealed a mean TE score of 0.77. A similar study of eggplant farmers in Abia State showed that mean TE was 0.78, while Onyenweaku and Ohajiany's 2009 study of rice farmers in Ebonyi State revealed a mean TE of 0.65.

North-East

Available studies in this region reported very high levels of TE for cereals. For instance, Shehu and Msheila's (2007) study of rice farmers in Adamawa State revealed a TE of 0.96. Other studies of rice farmers in the same State revealed TEs of. 86 (Sheu, 2007), and 0.89 (Amaza and Maurice, 2005). In addition, Taru, (2011) reported a mean TE of 0.95 for cowpea farmers also in Adamawa State. The lowest TE from available studies in the region was for food crops in Borno State, with Amaza and Maurice (2005) reporting a mean TE of 0.68.

North-West

Fewer efficiency studies were available for this region. Ojo's (2009) study of onion farmers in Sokoto revealed a TE of 0.95, while Usman's (2010) study of sesame farmers reported a much lower mean TE of 0.57.

Table 2-Estimates of different measures of efficiency using the stochastic frontier model in regions for which studies are available

Study	Location	Cropping System	Crop	Measure of efficiency (mean)		
South-west				TE	AE	EE
Fasoranti (2006)	Ondo	Sole	Cassava	0.85	0.82	

	Ondo	Mixed	Cassava, plus maize	0.89	0.93	
	Ondo	Mixed	Cassava and other crops	0.98	0.92	
Oladeebo (2006)	Osun	Sole	Rainfed upland	0.90	0.92	0.83
	Oyo	Sole	Rainfed upland rice	0.90	0.90	0.84
Adeyemo, Oke & Akinola (2010) Ajibefun (1998)	Ogun		Cassava	0.89		
			Small scale food crop	0.60	0.66	0.43
Oluwatayo, Sekumade, & Adesoji (2008)	Ekiti		Maize	0.68		
Oluwatosin (2011)	Osun		Yam	0.70		
Ogunniyi (2011)	Oyo		Leafy vegetable			0.42
NORTH-CENTRAL						
Amos, Chikwendu, &	Niger	Sole	Maize	0.53		
Nmadu, (2004)		Mixed	Yam, maize	0.72		
Adejoh (2009)	Kogi		Yam	0.73		
Ojo et al. (2009)	Niger		Yam	0.75		
Shehu et al. (2010)	Benue		Yam	0.95		
Otitoju & Arene (2010)	Benue		Soybean	0.73		
SOUTH-SOUTH						
Ebong, Ukoro, & Effiong (2009)	Akwa Ibom		Food crop	0.81		
Ekunwe, Orewa, & Emokaro (2008)	Delta		Yam	0.85		
Idong, et al. (2009)	Cross River		Swamp rice	0.77		0.17
			Upland rice	0.87		0.22
Oviasogie (2005)	Edo	Sole	Yam	0.84		

		Mixed	Yam, maize	0.59		
			Yam, groundnut	0.39		
			Yam, maize,	0.24		
			Melon, cassava			
Idumah (2006)	Delta and Rivers		Food crops (polluted)	0.78	0.88	0.68
			Food crops (unpolluted)	0.88	0.84	0.72

SOUTH-EAST						
Raphael (2008)	Abia, Imo		Cassava	0.77		
Okezie & Okoye (2006)	Abia		Eggplant	0.78		
Onyenweaku &	Ebonyi		Rice	0.65		
NORTH- EAST						
Shehu & Msheila (2007)	Adamawa		Rice	0.96		
Shehu et al. (2007)	Adamawa		Rice	0.93		
Amaze et al. (2005)	Borno		Food crops	0.68		
Amaze & Maurice (2005)	Adamawa		Rice	0.89		
Taru et al. (2011)	Adamawa	Sole	Cowpea	0.95		
NORTH WEST						
Ojo et al. (2009)	Sokoto	Irrigated	Onion	0.95		
Usman et al. (2010)	Jigawa		Sesame	0.57		
Tanko & Jirgi (2008)	Kebbi		Arable crop			

Source; Field Survey, 2015

Note: EE is defined as the capacity of a farm to produce a predetermined quantity of output at minimum cost for a given level of technology. The higher the value, the closer the farm is to their production frontier, and the less likely it is to increase output without increasing inputs.

In summary, while the studies that have been highlighted do not by any means exhaust the universe of efficiency studies in Nigerian agriculture, they do provide some idea of the crops in which farmers are most efficient. There is no discernible pattern by region, but from these studies, Nigerian farmers are most efficient in the production of tubers (cassava and yam) and rice. This finding was consistent in most regions in which these crops were produced. The only exception from these studies is in the South-East where farmers were not as efficient in the production of tubers (cassava) and rice as farmers in other regions

Factors that affect efficiency

There is a large literature on the factors that affect the levels of efficiency of Nigerian farmers. Variables that have an unambiguous positive impact on efficiency include having a male household head (Otitoju and Arene, 2010). Educational attainment of farmers (Fasorant, 2006; Oladeebo, 2006), land ownership and farming systems (Fasoranti, 2006), contact with extension agents (Ojo, 2009; Ebong, Ukoro, and Effiong, 2009), membership of cooperative societies (Shehu, 2010, Idiong, 2009), and access to credit (Ogundari, 2006; Oluwatosin, 2011).

Nigerian agriculture is still male dominated, implying that men have more access to the resources and information required to produce crops more efficiently than their female counterparts (Fasoranti, 2006; Otitoju and Arene, 2010). More educated farmers are more likely to adopt progressive farming practices and new technologies and thus increase their overall efficiency (Fasorant, 2006; Oladebo, 2006; Oluwatosin

2011: Adeyemo, Oke, and Akinola, 2010; Adejoh, 2009; Shehu, 2010; Amos, Chikwendu, and Nmadu, 2004) Also, landowners are more efficient than renters because they are more invested in their landholdings (Fasoranti, 2006), and farmers who practice mixed cropping often have more land holdings (Fasoranti, 2006), and farmers who practice mixed cropping often have more profitable and efficient farms. This was found for a wide variety of crops including cassava in Ondo State (Fasoranti, 2006) and maize (mixed with yam) Amos, Chikwendu, and Madu, 2004). Mixed cropping has the advantage over sole cropping as crop diversification guards against crop failure, leading to higher yield stability and reduced risk (Fasoranti, 2006).

However, having more than an optimal number of crops in a mixed cropping system reduces the efficiency of production (Ebong, Ukoro, and Effiong, 2009).

Contact with extension agents exposes to new technologies and improved varieties of inputs (particularly seed) (Oladebo, 2006; Adejoh 2009; Ojo, 2009; Ebong, Ukoro and Effiong, 2009), while membership of farmer's association/cooperative societies creates an avenue for farmers to pool their risks, in addition to providing access to resources and information that will improve their production practices, highlighting the importance of some social capital in improving productivity (Shehu, 2010; Idiong, 2009; Idumah, 2006). Finally, access to credit reduces inefficiency as it enables farmers to adopt high yielding varieties and makes it possible for farmers to access information useful for increasing proclivity and efficiency (Ogundari, 2006; Oluwatosin, 2011). Oftentimes, cooperatives and farmer associations exist to fill the market failure caused by the absence of decent credit markets.

There are other factors that have a more ambiguous impact on efficiency. While some studies find that age and years of farming experience improve efficiency as a result of "practice makes perfect" (Otitoju and Arene, 2010; Adeyemo, Oke and Akinola, 2010 Ebong, Okoro, and Effiong, 2009; Ekunwe, Orewa, and Emokaro, 2008; Idiong,

2009). Many other studies find that both factors have negative impacts on efficiency as older farmers are less likely to adopt new technologies. Consequently, the gain of the farming population is a source of concern (Ajibefun 1998; Ogundari 2008; Oladeebo 2008; Ogunniyi 2011. Amos, Chikwendu, and Nmadu 2004. Ojo, Ebong, Okoro and Effiong, 2009).

Finally, high cost of inputs, including fertilizers and herbicides negatively affects the efficiency levels of smallholder farmers (Adeyemo, Oke and Akinola, 2010) as does the pollution of land holdings in the South (Idumah, 2006).

Another important factor is farm size. The inverse relationship between farm size and efficiency is well documented and could be attributed to the higher labour intensitles on small farms due to lack of off-farm employment opportunities (Masterson, 2007). Labor is the most important factor of production in smallholder Nigerian agriculture (Adewuyi, 2002) as it is usually dominated by family labor (Ojo, 2005) Labor often accounts for more than half of the costs of production (Oladejo, 2005; Oviasogie, 2005). There is evidence that farmers are allocatively inefficient in the use of labour, over-utilizing this factor in the production process (Ojo, 2005). Household size is an important predictor of efficiency for similar reasons, as it is the source of the most important factor of production on smallholder farms, namely, family labour. Some studies find that household size has a negative impact on efficiency, implying that individuals in these households act as a drain on household resources instead of a source of labour supply (Ebong. Ukoro , and Effiong, 2009; Idiong, 2009).

2.3.1 DETERMINATION OF AGRICULTURAL PRODUCTION COMPLEX

Agricultural production policies in Nigeria comprise those of food crop production, livestock production, fish production and forest products and wildlife.

The major objectives of food crop production policy are:

(i) Self sufficiency in food crop production

(ii) Improvement in the level of technical and economic efficiency in farming.

In order to achieve the above, the following targets are to be pursed.

* Ecological specialization – relating production to locality

* production mode (small-scale farming medium and large-scale, backward integration and back to the land programme)

* Input supply (seeds, water, fertilizer, agrochemical etc

* Input subsidy that covers seed and seedling, water supply.

Pesticides, herbicides, as well as farm services such as processing, storage, tractor hire, extension and pest and diseases control service.

3. The objectives of the national fisheries policy are, among others

* To achieve self sufficiency in fish production within a short period of time.

* To develop and modernize the means of fish production, processing, storage and marketing and

* To promise export trade in strips, crabs, oysters, periwinkles and shark tins.

The major objectives of industrial crop production policy are, among others.

* Self sufficiency in the production of industrial crops required as raw materials for industries

* Modernization of the structure and organization of industrial crop production and processing.

4. **With respect to forest products and wildlife, government policy objectives include:**

i. To consolidate and expand forest estate in Nigeria

ii. To conserve and protect forest and its environment

iii. To reduce waste in the utilization of forest products to tolerable level.

5. Policy on Support Services

The policy on support services covers agricultural extension and technology transfer, agricultural credit, agricultural insurance and agricultural product marketing. Other aspects are agricultural commodity storage, agricultural cooperatives, agricultural mechanization, Agricultural statistics and data bank, and rural infrastructure.

The policy to protect the Nigerian farmers includes:

(i) Making the insurance compulsory for agricultural loan beneficiaries to improve loan recovery

(ii) Initial coverage of crop livestock production in all the ecological zones of the country.

Policy on Agricultural commodity

(a) To enhance inter-seasonal and inter-year food price stability and

(b) To ensure a higher food security for the nation.

6. On agricultural research, the government policy objective include:

(i) To develop improved and high-yielding production materials such as seed, seedlings etc

(ii) To develop appropriate technologies in areas of land preparation, planning, harvesting, and

(iii) To develop appropriate technologies for the optimum utilization of farm input such as fertilizer, herbicides, pesticides etc.

7. Government objectives on rural infrastructural policy are:

(i) To improve the quality of life of the rural people

(ii) To promise more equitable distribution of public investments between the rural and urban areas and

(iii) To promote and sustain development of vast rural resources for human benefits

Strategies of these objectives include:

***** Construction of feeder roads and water ways

* provision of potable water for rural inhabitants

* provision of rural health, postal, banking and recreational facilities in the rural areas.

The government has an agricultural statistics and data bank policy. The objectives are:

(i) To provide on a continuous basis accurate and timely data on agricultural output, prices, incomes inputs, production cost etc, and

(ii) To adopt a system of agricultural census that will secure, prepare, and release annual agricultural data.

According to the blueprint, Federal Government will be responsible for, among others

(a) Providing general policy framework within which agricultural production will develop

(b) Research into all facets of agriculture

(c) Maintaining strategic grains and annual product reserves

(d) Developing water resources

On the other hand, the State governments will be primarily responsible for, among others.

(i) Promoting primary production of all items of agricultural produce by maintaining a virile and effective extension service.

(ii) Maintaining better stocks

(iii) Owing, managing and controlling forest estates and ensuring access to land.

The local government authorities will be expected to take over progressively the responsibility of the State government with respect to:

(i) The provision of an effective agricultural extension service

(ii) The mobilization of farmers for accelerated agricultural and rural development

(iii) Provision of land for new entrants into farming and the coordination of data collection at the primary levels.

Policy Statement Versus Policy Implementation

There are much gaps between them.

Pre-requisites for policy effectiveness

1. Development of sound policy manager
2. Restructuring of institutional framework for the collection, analysis and presentation of agricultural statistics
3. Close supervision of programme implementation to minimize frauds and policy distortions by officials.
4. Frauds in implementation process can be minimized through the establishment of public accounting system with sufficient safeguards to ensure public accounting and probity.
5. Government should give more attention to the integration of product and marketing activities
6. Gains of agricultural development should be more equitably distributed so as not to engender real national development.
7. Support services for agricultural development should receive greater funding if programmes are to be effective.
8. Creation of appropriate political and investment climate for agricultural development. (Ijere, 2000).

DEVELOPEMNT PLANS AND AGRICULTURAL DEVELOPEMNT

The period between 1960 and 1969

This period was characterized by minimum direct government intervention and decentralized approach to agriculture. The Federal Government only played a support role while the regional and the State governments were left to take major initiatives.

This led to the private sector especially the traditional poor and small resource-holder farmers to produce the bulk of the food for local consumption and export. On the part of the government, emphasis was placed on the research, extension, marketing and pricing of export-based crop to the neglect of the food crop sub-sector. In general, the performance of the agricultural sector during this era was satisfactory as it fulfilled its major roles by making food importation less pronounced, but generated a lot of foreign exchange through the balance of payments.

The period of 1970 To 1985

During this era, government intervention was very pronounced. What gave rise to this was the fear that the sector was no longer performing its primary roles; hence a variety of macro and microeconomic policies were introduced. Heightened by the upsurge in revenue from the crude oil export, government macro-economic policies became expansionary, while sectoral policies emphases direct government involvement in agricultural production. Moreover, confessional interest rates became mandatory for agricultural loans.

In quick succession, the Nigerian Agricultural and Cooperative Bank (NACB) was established, followed by the Agricultural Credit Guarantee Scheme Fund (ACGSF)) in 1977. Other policy measures introduced include liberalized food imports and low tariff on importation of agricultural inputs, creation of food and livestock production and marketing companies. Agricultural Development Projects (ADPS), River Basin Development Authorities (RBDAS), Operation Feed the Nation (OFN) Green Revolution etc. and more research institutes were established along with the re-organization of the commodity boards which gave rise to the grains boards. Ironically, despite the spate of policies and reforms with huge investments and characterized this era, massive food and raw materials importation for the masses and agro-allied

industries, drastically drained our foreign reserves, even as earnings from agricultural export dwindled.

The period from (1986) To 1996 (SAP Era)

With the economic down-turn of the early 1980s, it became further evident that the agricultural sector could no longer perform its traditional role due to its neglect. In response to this, the 1986 budget was designed to address the various distortions in the economy by introducing new programmes and fine-turning existing ones. For instance, the River Basin Development Authorities (RBDAs) were restructured, while the Directorate of Foods Roads and Rural Infrastructures (DFRRI) were inaugurated. The former was directed to concentrate on the supply of water for irrigation, while the latter provided the enabling environment for direct agricultural production. Some of the other creations include the National Directorate of Employment (NDE). Nigeria Agricultural Insurance Corporation (NAIC), Peoples Banks (PBs) and the Community Banks (CBs).

By mid 1986, a comprehensive economic recovery programme tagged Structural Adjustment Programme (SAP) was launched to restructure and diversify the productive base of the economy so as to reduce dependence on the oil sector. Some of the strategies employed include a realistic exchange rate policy, liberalization of the external trade and payment system, adoption of appropriate pricing policies, and reliance on market forces, reduction in complex administrative controls, deregulation of interest rates and devaluation of the Second Tier Foreign Management (SFEM) and then Autonomous Foreign Exchange Market (AFEM).

Precisely in 1988, an agricultural policy was formulated for the country to encourage the private sector embrace all the sub-sectors of agriculture and bring them to full potential before the end of the 21st century. Indeed the performance of

agriculture since the onset of SAP has been a mixed grill of ups and downs in programme planning, implementation and evaluation. These are characterized by inconclusive achievements in research, production, extension and technology transfer, credit insurance etc.

Specific Roles of Government in Agricultural Development Programmes.

Government can assist in the following areas:

1. Research: This is achieved through research institutes, universities etc.
2. Quarantine services: Thorough examination of imported planting materials
3. Agricultural Education: This includes both formal and non-formal (extension) education.
4. Agricultural Subsidies: Reduction in cost of a product
5. Agricultural Policies: Guidelines that will enhance agricultural productivity.
6. Agricultural Credit: This is granting of loans to the farmers.

2.4 ROLES OF CO-OPERATIVE IN AGRICULTURAL PRODUCTION AND PROFITABILITY

As Berko (2005) contended, other than public sector institutions, co-operatives have played a very important role in developed nations to ensure increased productivity and total output in agriculture. In some of these countries, over 70 percent of the farmers belong to type of co-operative society or the other, and in many years, cases over 80 percent of the delivery of production inputs, including credit, is affected through co-operatives. At the downstream sector also, over 80 percent of agricultural products is marketed through co-operatives. Our co-operatives have not

reached these stages yet, but they have the potential to reach such peaks. The food security objectives of the United Nations and various developing countries can be achieved with the proper involvement of co-operatives in the agricultural sector.

Berko (2005) further noted some seven specific economic functions of agricultural co-operatives in both the upstream and downstream sectors, namely; land acquisition, mechanization, the supply of farm implements and the supply of production credit, marketing and processing. There are, according to Berko, some of the function that if properly carried out promote agricultural development.

LAND ACQUISITION THROUGH CO-OPERATIVES.

Land acquisition co-operatives- includes co-operatives which are formed by government (sometimes with compulsory membership), especially after land reform, so that the co-operatives are apportioned part of the land by government for co-operative family (Berko, 2005, citing ILO, 1988).

The second group consists of co-operative that are formed on voluntary basis to negotiate for land, either from government or private land owners (land leasing co-operatives). This group is almost non-existent in Nigeria mainly because land has in the past not constituted so much of a problem for agricultural production. Today however, land is a problem for many small-scale, full-time peasants and for part-time and tenant farmers. The third group is made up of those which are formed for the management water resources through irrigation and drainage, the installation of tanks, wells, and pumps, etc. A fourth group-land acquisition or land reform co-operatives are the results of voluntary land consolidation by individual land owners whose fragmented holding contribute to inefficiency in agriculture.

Co-operatives in the first group were usually found in the former socialist Republics of the USSR, the Eastern Europe countries (Berko, 2005, citing

ILO, 1964) and are still found in China and the Latifundi and Minifundi countries of Latin America. The current attempt in Zimbabwe to redistribute land will not achieve much if land is not redistributed mainly through co-operative groups. There is the danger that individuals can sell back their portions of land to the large farmers and even if they do not do so, they may not manage the plot properly on non-co-operative basis. Land leasing co-operatives have been formed in Italy, Finland, India, Pakistan, and other countries. Their initiation is said to have been very important part of United State farm security administration programme in the years immediately before the Second World War (Berko, 2005, citing ILO, 1964). In the third group are co-operative which cultivate the irrigated land of River Basin Development Authorities. In this country, the Adani rice project (Enugu state) owed its success partly to these co-operative. We find such co-operatives also in Northern Nigeria where cultivators are not only provided with Fadama land but also with irrigation and other facilities. This country has great need and potential for this type of co-operative. The best known examples in the fourth group (Voluntary Land Consolidation) are said to be found in Punjab where as at 1963, or there about, over 500,000 hectares of land had been consolidated on voluntary basis (Berko, 2005, citing ILO, 1964). One would wish that Nigeria and other Third World Countries could emulate this good example. Land acquisition/reform co-operatives are very important in agriculture because generally they;

1. Help to make land available to those who do not have enough or are landless. In Nigeria, for example, there are many people who cannot go into agriculture because they have no land, and yet over 50% of the country's arable land (about 40 million hectares) remains uncultivated (Berko, 2005, citing Umar, 1986). Since there are few instances of land acquisition co-operatives in the country, it is a challenge to the co-operative movement to think of organizing

such co-operative so that their members could benefit from land acquisition through one form of arrangement or the other, especially in collaboration with government and its agencies, local leaders and land owners. For serious part - time farmers, land acquisition co-operatives will be very helpful;

2. Ensure secure title to land, which in turn indicates high investment in land and increased productivity (Berko, 2005).
3. Make input distribution cheaper, easier, and more effective. Since the farms will be at one location or on a few locations, as distinct from the situation which when individuals farmlands are fragmented and scattered over a large expanse of land. This is why Idachaba (2005), cited in Berko (2005) has called for embarking upon an Accelerated Co-operative Input Distribution (ACID) programme. The Fadama land co-operatives benefit from this; and
4. Make mechanization or tractorisation more effective and cheaper.
5. Facilitate the work of extension officers and other change agents.
6. It is easier and cheaper to construct feeder or rural roads to farm location since they are centralized through co-operatives.
7. The centralization of farmland reduces costs of transports in a general and facilitates the construction of storage facilities, as well as the undertaking of processing at the farm locations where this is desirable and economical.

This positive effect of land reform co-operatives in several countries have been well documented elsewhere (Berko, 2005).

Tractor Mechanization and Animal Traction. According to Berko (2005), tractor mechanization and animal traction contribute to higher total yields and hence higher incomes of farmers. Each of this has its own advantages and disadvantages. Through tractor mechanization and animal traction, larger areas can be brought under cultivation; trees and stumps can be uprooted; the land can be prepared for cultivation

and equally important. They ensure that crops are planted at the right time since they speed up work. Individual small farmers are not able to buy their own tractors and other relatively expensive implements, nor are they even able to obtain the services of State tractor-hire service stations, if any at all. Even in Europe where farmers are far richer than our farmers, it is not every farmer that can afford to own tractor.

Machinery co-operatives are, therefore, a very important feature of the German agricultural co-operative system. Farmers through their co-operatives can buy or hire tractors to work on their farms, either on individual holding or non-co-operative basis, as either productive or production promotion co-operative or as auxiliary co-operatives with a high level of integration in land management. The application of machines on farms certainly becomes easier and cheaper under a co-operative arrangement-thanks to the economies of scale, including fuller capacity utilization. It is also possible for co-operatives to manage tractors owned by the State since they tend to do better job than government parastatals, a general claim that contradicts Oluka's findings Berko, (2005.) In the 1980's, most States in the country have government-financed and managed Tractor Hire Service Stations, but today, only a few are functional, if at all.

Animal traction which is common place in savannah grassland areas and therefore commonly found in the northern parts of Nigeria, holds real economic attraction for small-scale farmers. In some years gone, an Ox and some basic ploughing implements were within the reach of many smallholder famers. With the rising incidence of poverty, especially among rural people Berko, (2005) and the rising cost of Oxen and agricultural implements, very few farmers can now afford to individually own a bull and the required implements. This best way out, it seems to Berko, is for the farmers to team up in co-operatives for animal traction management. A co-operative society of 10 - 15 members can more easily raise the necessary fund

for purchase between 3 – 5 draught animals and the required ploughs and harrows etc. The animals can be insured and the members can make fuller use of the draught animals and equipment. With animal traction as an alternative to tractor mechanization, farmers can expand their farm holdings and thus increase their potential to increase their outputs and incomes.

Supply of Farm Implements

As Berko (2005) noted, other than mechanization, agricultural co-operatives societies sometimes provide their members with basic agricultural production implements. Among such basic implements are: cutlasses, hoes, diggers, rakes, shovel, spraying machines etc. In some cases, these implements are sold by consumer co-operatives which are sometimes involved in importation to carry out this function. In its early life in 1940s, the Nigerian Co-operative Supply Association (NCSA), which was generally seen as a national apex (wholesale) consumer association, imported and traded in such implements. Today, such co-operatives are almost non-existent in the country, a sad development indeed.

Supply of Production Inputs

As Berko (2005) contended, agriculture can hardly be productive without the right inputs; improved seedlings/seeds/cuttings, fertilizers, pesticides, etc. These are usually not within the reach of individual smallholders in developing countries. Co-operative organizations are, however, able to obtain these inputs more easily and at relatively cheaper prices too, -thanks to the economies of scale and the policy of some government in the developing countries to distribute or sale such inputs, sometimes at subsidized prices to farmers through their co-operatives and similar farmers' organizations. In this country, for example, fertilizer used to be sold to farmers at subsidized prices, partly through co-operative, except that in recent years some state

governments have not used co-operative which is used to sell at government controlled prices of between ₦15 to ₦20 was sold for between ₦40 to ₦60 on the black market some eight years ago.

These days, things are far worse. In 1995, for example, a bag of fertilizer which the government sold for ₦1000 was sold for ₦500 by middlemen to farmers. By July 1996, fertilizer which was then exclusively sold by government was yet to be sold in some part of the country. A bag of fertilizer which should have been sold for between ₦150 and ₦200 went for between ₦1000 and ₦1300 on the open market in some parts of the country between 1997 and 1998. Things would have surely been better for farmers if co-operative had been used to directly sell fertilizers to them. It is certainly not enough selling these inputs to farmers without the appropriate knowledge and technology to go with them. Here again co-operatives play a significant role by teaching their members how to apply these inputs properly. This they can do by linking extension officers to these farmers or even employing their own extension agents. The latter is yet to catch on with our co-operatives due to the high financial outlay that this will involve.

According to Berko (2005), in connection with the provision of production input and other and other new technologies, it is important to emphasize that farmer's need information to improve or adapt their farming. This information can be provided by public agencies, but it can be very effectively complimented by co-operative societies. In some cases public sector extension services are most inefficient and in the absence of other intermediaries to take on the function of extension, very useful research findings merely remain on dusty shelves. In such cases, co-operative societies can provide a vital missing link between research institutes and centers and farmers to affect technology transfer and become providers of feedback. As has

rightly been pointed out, unless research is relevant and readily available to the end user, investment in Research and Development is useless. (Berko, 2005).

Perhaps, more importantly, we should not forget that is one thing having innovative agricultural inputs and other new technologies in a country and another having them adopted. Co-operative organization can quite effectively influence their members despite their generally perceived conservatism: to adopt innovations which have the potential to increase output. According to Berko (2005) citing Obibuaku (1978), reports that most of the co-operative group farmers in NORCAP adopted most of the innovations introduced. 100% adopted the improved rice varieties; 86% adopted the use of Aladrin Dust and 91% planted the agricultural maize. The erstwhile Federal Agricultural Co-ordinating Unit (FACU), now Project Co-ordinating Unit (PCU) and the state-wide Agricultural Development Projects (ADPs), Berko explains, are gradually showing interest in using co-operatives. But how long should we wait for these agencies to appreciate the potential of these organizations and involve them in their programmes and strategies?

According to Berko (2005), the various specific roles that the co-operatives play in agricultural development are diverse. Most of these roles/functions are economic in nature, but are social, educational and even political in orientation.

Supply of Agricultural Credit

According to Berko (2005), one of the most important contributions of co-operatives to agricultural growth and development is the provision of credit facilities to their members. Providing agricultural credit to smallholders on individual basis is a most difficult task. About 70% of all households of most developing countries are farmers. It would mean for example, in Nigeria, Credit institutions would be dealing with about 17 million farming households out of the total of about 24 million

households in Nigeria. Agricultural credit management administrations through co-operative have several advantages due to the functions these co-operative carry out. These include:

1. Mobilizing of members small savings;
2. Linking co-operative members to credit institutions/facilities. This allows more people to be reached than would otherwise be possible, if the credit institutions were to directly seek their agricultural loan customers and deal with them;
3. Saving farmers from the clutches of usurious money lenders
4. Undertaking to scrutinize individual member's credit worthiness;
5. Negotiating better credit terms for their members and in some cases undertaking to guarantee to loans;
6. Supervising the use of loans to ensure their non diversion and proper use; one way of doing this is to supply part of the credit in kind. Another possibility to organize the farmer into productive or production promotion co-operatives. (Berko, 2005, citing Berko, 1986).
7. Ensuring the repayment of loans, for example, through linking marketing with credit and using group pressure or sanctions on their members. (Berko, 2005, quoting Berko, 1986).
8. Co-operative can also generate their own internal sources to supplement those of lending institutions. As at December, 1988, for example, farmers multipurpose co-operatives in Imo State had mobilized a total of ₦3,576,735.00 through share capital and savings; and
9. Reduction in the cost of credit administration. This applies to co-operative lending out their money or carrying out on-lending in partnership with other lending institutions. The on-lending partnership of the former Nigerian Agricultural and Co-operative Bank (NACB), now Agricultural Co-operative

and Rural Development Bank (NACRDB) and co-operative financing agencies, which has almost been abandoned, was certainly far more cost effective and efficient than the bank's direct lending programme (Berko, 2005, citing Berko and Okorie, 1990). Even though some Co-operative Financing Agencies (CFAs) in the State had a very high default rate of experience with lending (Berko, 2005, quoting Ike, 1986; Ebue, 1988:). Moreover, the success story of Bauchi State Co-operative Financing Agency in its lending programme in recent years is testimony to the possible efficient management and administration of financial resources through co-operatives. NACB's small-holder direct lending strategy entails more risk than the co-operative on-lending, both in the short and long-run.

These advantages according to Berko (2005), explain the Agricultural Credit Guarantee Scheme Fund (ACGSF) of the Central Bank of Nigeria, both as elaborated in the initial Central Banker's proposal and the recommendation of the Bankers committee as well as the 1976 Report Of The Okigbo Financial System Review Committee. It was indeed hoped that co-operative societies would be the main vehicle through which bank credit would reach the bulk of the farmers. The recommendations of the Bankers Committee of April, 1976, which form the basis for the establishment of the ACGSF, stated in explicit terms that loan should be through town and country co-operative societies. The bankers committee therefore, recommends that government should aid the establishment of farmers co-operative at the village, district, and State levels throughout the country (CBN, 1976)

Marketing of Agricultural Produce

The production promotion function of co-operatives land acquisition, mechanization, supply of credit, biological input or inputs, implements, etc. lead to

increased productivity and total output It is, however, not enough to increase without an appropriate marketing framework. In fact, increased output can sometimes lead to less net income due to falling prices and wastage at the farm gate or somewhere along the distribution channel Berko, (2005). As Berko further puts it, co-operatives, therefore, have a critical role to play to ensure that the products of their members are marketed in such a way that the following effects, among others, are achieved:

1. The influence of exploitation middlemen in as much as possible curtailed in the community in general .Through marketing, co-operative farmers receive fair price for their products and that price are stabilized. They are important on both local and international market.
2. More specifically, small producers are protected from or made less susceptible to middlemen and similar oppressive trade operators (Berko, 2005).
3. Farmers are relieved of the task of marketing his output himself/ herself and this ensures that more time is available for actual production activities and rest.
4. Adequate and cheaper transportation is made available.
5. The product of farmers is processed and preserved properly in order to prevent deteriorating and loss in quantity, quality, and prices.
6. The raw products are properly stored.
7. Supply is regulated when there is a threat of oversupply.
8. Appropriate steps are taken to make the product of these farmers competitive on the marketing through grading, standardization, packaging, etc; and
9. Finally. An overall increase in net income of farmers is guaranteed and the rise in members' living standards can be expected.

With special reference to linking marketing to other important function, it may be instructive to cite the cases of Egypt and Zambia and a local one Berko (2005). In Berko (2005) with substantial abolition of the government –controlled agricultural

commodity marketing system in Egypt, (through the instrumentality of the central Agricultural Co-operative Union (CACU), CACU has for some time been actively involved in marketing commodities and farm inputs and through these activities endeavor to raise members living standards.

As Feingold (1991), cited in Berko (2005) further put it, CACU potato export venture is a particularly interesting example of what professional marketing expertise can achieve. He emphasizes that CACU is assisting its affiliates, the potato grower co-operatives to organize the production of the potatoes so that members grow the right varieties at the right time and use the right and use the right techniques to achieve the target yields of the high quality tubers. For this purpose, the co-operative supplies the growers with seeds and farm inputs, and provide extension advice. CACU have been able to break into the United Kingdom's potato market and is reportedly doing export business. In Berko (2005) equally states that, to ensure regular supplies of high quality potato, CACU has built very large cold storage facilities and in general exercised strict quality control.

In Zambia, the Zambia co-operative Federation (ZCF) was allocated on a trial basis, a three years marketing monopoly for all food commodities. After that period, free competition was to be allowed. The ZCF was reportedly developing an integrated production and marketing chain to carry out the new task (Berko, 2005). We are further informed that, it supplies farmers with farm inputs facilities and access to credit, provides extension services and organizes the marketing. When farmers deliver their produce, credit or advances are deducted before payment is made (Berko, 2005, citing Feingold, 1991). This means that credit was effectively linked with marketing as was done in the NORCAP experiment (Berko, 2005, citing Berko, 1986). According to Berko (2005), citing Feingold (1991) the federation was trying to introduce a more business-like approach, including reduction in marketing cost.

Also according to Berko (2005), a good case for marketing co-operative societies is assumed up in paragraph 15 of the report on the technical meeting on co-operative in Asia and Far East, organized by Food and Agriculture Organization of the United Nations (FAO) at Lucknow India in 1949. According to the report; well organized co-operative marketing institutions would confer even greater benefits on the agricultural producer than do credit institutions.

As Berko (2005) further put it, even through the Report recognizes that interest rate charges on credit given to an agricultural producer by credit institution may not be far lower than the interest rate charges of the village money-lender, the farmer suffers more at hands of farm-gate buyer who gives him inadequate share of the price of his produce. The report goes on to state, moreover, the existence of a chain of middle men in the marketing of agricultural goods considerably reduces the return to the producer. If such middle men could be eliminated and a fair share of the price secured for the farmers, the additional income he would receive thereby would be of far greater benefit to him than a reduction of interest. Such an additional income would also help him to pay debts owed to the society more readily and thus strengthen credit institutions themselves (Berko, 2005, citing FAO, 1959).

Though Berko (2005), does not completely agree with the exaggerated advantages of marketing co-operative over credit institutions, it is evident that agricultural marketing co-operatives are very important for the general welfare of producers and consumers alike. Opinions sought recently by Berko (2005) from participants at workshop organized by the NACRDB in Enugu and Umuahia by the NACRDB confirms the high rating of marketing co-operative over credit institutions which offer micro-credit. In many African countries, Ghana, Nigeria, Tangayika Tanzania, Uganda, Kenya, etc, the co-operative movements began with marketing co-operative which were mainly involved in export crop sub –sectors. Thus, in Ghana and Nigeria, cocoa marketing

co-operatives were the first to be established in the late 1920's and early 1930's (Berko, 2005, citing DeGraft-Johnson, 1958; Gorst, 1959; Hanel, 1967; FAO, 1959; Onuoha, 1979;).

Processing of Raw Materials

According to Berko (2005), rural people have generally been producers of raw materials, while the urban elite install equipment and plant to process these raw resultant value added is usually about 30-50% higher, or even more than the value of the raw materials. The net profit made by these urban processors is, therefore, usually huge. The value added is indeed expropriated by the urban manufacturers from the rural farmers who thus continue to be poor. Small peasant farmers as individuals cannot set up factories to process their raw materials. They, therefore, needed to team up to acquire their own modern processing plants. Industrialization policy, according to Berko, must be formulated in conjunction with agrarian policies, at least in the benefit of the producers of agro-based raw materials. Agricultural co-operatives can vertically integrate forward, to the value added processing stage and by so doing enable embers to become owners and operators of an agro-industrial venture.

As Berko (2005), further puts it, in most developing countries, governments are not only interested in encouraging farmers through co-operative to process the raw material they produce. These some governments go through credit delivery and the provision of technical services. In this country, according to Berko, the Better Life Programme (BLP) for rural women was exemplary in this respect. Between 1987 and 199, women co-operatives under the Better Life were given 1million naira in the former Anambra State alone to go into production and processing of agricultural produce. Also, during the tenure of General Abacha as Head of State in the mid 1990s, the Family Economic Advancement Programme (FEAP) gave out about 5 million naira to agricultural and in particular processing co-operatives. Today, one can find

some rural/cottage industries spread throughout the country owned by co-operatives established under the sponsorship of the erstwhile Better Life (for rural women) and FEAP programmes. Even though these women co-operative cottage industries have not generally performed well, it is a good beginning to better the lives of the rural people through industrial /processing co-operative (Berko, 2005).

2.5 Empirical Evidence

Oyeyinka and Bolarinwa (2009) in their study in International Journal of Agricultural Economics and Rural Development examined the use of NACRDB to increase Agricultural production. One hundred and thirty(130) beneficiaries and One hundred and thirty(130) non-beneficiaries were use for the study and the result showed that beneficiaries had significantly high mean yield index (1467) than non-beneficiaries with (600) yield index. Again the agricultural producers in Oyo state that benefited from the NACRDB loan earned income (N70,000 per annum) which is higher than that of non-beneficiaries of (N30,000 per annum). This indicated in the study that NACRDB smallholders direct loan scheme can transform rural agriculture and increase productivities. The authors recommended that loan should be disbursed to the beneficiaries with minimum delay, since respondents identified timely disbursement of loans as a way of effectively implementing the loan scheme. They also recommend that an enabling environment should be created for improved loan recovery like a legal unit in NACRDB (under an autonomous setting) to prosecute loan defaulters.

Again, in another study carried out by Awotodunbo (2008) on the constraints to small-scale farmers in production in Etsako East LGA of Edo state. One hundred and fifty(150) farmers were randomly selected from eleven villages in the local govt. It was shown that only 7% had access to bank loan, while 93% accessed loan from other sources like cooperative societies, personal savings and relations. The study recommended that strategies that can return confidence on bank loan should be

introduced to enhance agricultural financing with the aim of improving the standard of living of farmers in the area.

Ajayi and Nwalieji (2010), studied the impact of Anambra state Fadama project phase 1 on Agricultural production. Eighty (80) project farmers and eighty (80) non-project farmers were selected and the result shows that Fadama User Groups formed cooperatives perform more and is more profitable than non- user group / individual farmers: Again farmers produced more when united in a group than individually. They recommended that Fadama users should be encouraged to form and stay long in cooperative to benefit.

Fasoranti Olayiwola Olujenyo (2014) worked on "The Determinants of Agricultural Production and Profitability in Akoko Land, Ondo State, Nigeria. One hundred(100) beneficiaries were selected through multi stage sampling technique. The analysis shows that aging cooperative farmers were quite experienced and more effective; the productivity and efficiency analysis showed that production was significantly increased as a result of cooperative membership. It was recommended that more farmers be encouraged to stay in the cooperative for profitable productions.

Another study by Gwary, Kwagh, Ja'afar-furo, and Dennis, (2011) focused on entrepreneurial agricultural activities of youths in Michika L.G.A of Anambra State. Hundred(100) youths were randomly selected. The results of their findings showed that youths were interested in Agricultural production if capital could be made available to them. Again youth cooperative showed more interest in agricultural production as a means to providing employment to them. They recommended that financial institutions be encouraged by the government to provide assistance to the youths and that the youths themselves should engage more in other non-agricultural enterprises to generate supplementary incomes.

In their study of the role of women farmer's cooperative societies in Agricultural production carried out in Bauchi L.G.A of Bauchi state, Emefesi, Hamidu and Hauna, (2007) sampled eight 80 women farmers from randomly selected eight(80) cooperative societies. They came out with some findings which indicated that inadequate finance, lack of training of their members, inadequate farm implements and lack of suitable machines for women farmers' use were some of the constraints to the development effort of these farmer's cooperative societies. In the same vein they recommended, among other things, that appropriate technologies for women farmers should be made available and affordable; extension staff should provide training to these farmers cooperative societies. They also recommended that government should provide soft and medium term loan to women cooperative societies.

In another study by Ndifon, Agube, and Odok (2012) worked on sustainability of Agricultural cooperative societies in Nigeria, was carried out in the south-south zone, and Cross-River, Rivers and Edo were randomly selected out of the six States out of which five hundred and fifty eight (558) cooperative groups were studied. Using descriptive statistics, the outcome of their result showed that out of the total loan advances made to Agricultural cooperative members, more than 50% went to consumption purposes, while only 40% was used for agricultural production. Again, it was discovered that as a result of long bureaucratic procedures in obtaining such loans from NACRDB, farmers had to divert the money as period of farming has already passed. They recommended that the procedures for obtaining these loans should be short, and loan giving during planting season. They also recommend that members of agricultural cooperative should be encouraged to save, and government should help them in mechanization of agriculture for high productivity.

In a study carried out on the Agricultural Development Projects (ADPs) in Nigeria, Status and Policy Implications by Auta and Dafwang (2010) all the States in the

federation were visited by a multi-disciplinary team of three scientists each for a period of four days per State from 24th August and 10th September 2008 through the national Agricultural extension and Research Liaison Services. The study showed that in all the States of federation, the Agricultural Development Programmes were becoming shadows of their past as little or no activities are going on in those areas. Very poor funding of extension workers prevailed in almost all the States visited. The researchers recommended the establishment and funding of an Agricultural Extension and Rural Development Agency (AERDA) in all the state of the federation and a specific agency at the Federal level that will coordinate budgets, findings, international leakages and quality assurance of the services rendered by the State AERDA is to enhance agricultural production in Nigeria.

2.6 GAP IN LITERATURE

The empirical study has shown that various authors have written extensively on the effect of cooperative societies on agricultural productions, agricultural cooperative development, cooperative societies and their effect on increase farm production, etc., in different States of the federation and even in Enugu State but definitely not in the whole three senatorial zones of Enugu State recently. It is on this premise that the present study aims to fill this gap.

2.7 THEORETICAL FRAMEWORK: THE THEORY OF COOPERATION

Cooperation has been described by a variety of theorists. According to Glaser-Segura & Anghel (2002), it represent the union of two or more entities, leading to a more complex combination, which has a greater chance of serving environmental forces them as separate entities. Kropotkin (1902) extended Darwin's theory of natural selection to include cooperation among living and social system. Darwin's explanation of how preferential survival of the slightest benefits can lead to advanced

forms is the most important explanatory principle in biology and extremely powerful in many other fields. Such success has reinforced the notion that life is in all respects a war of each against all, where every individual has to look out for himself, that your gain is my loss but Kropotkin had observed that the species that survived where the individuals cooperated , that "mutual aid" (Cooperation) was found at all levels of existence .

Mead (1937), in his studies of living primitive societies, equally found that cooperative social organization leads to higher affluence not found in a solely cooperative social organization. In a political-historical analysis of civilizations, Eisler (1988) found variations between the social dominators model, in which societal exchange is carried out in hierarchical and competitive relationships and the social participation model, in which exchange are made through cooperative relationships. Eisler's framework is included in the collection of women studies and provides an explanation of male dominated versus male-female share power societies through history. Proponents' of socio-biology, in a different approach, view cooperation as a genetic survival trait. In the socio-biological paradigm, cooperation is found among relatives because extended family groups survived over individuals who did not cooperate with family and tribal members.

In socio-biology, cooperation is also considered an evolved trait among humans and other life forms (Nowak, May and Sigmund,1995).

These approaches to cooperation are varied; they place cooperation in historical and historical contexts, at macro and micro social settings, and as genetic and learned behaviors. This research approach specifically relies on what Campbell (1975) termed as a socio-cultural explanation for cooperation. His framework lies on variation, selection and retention of behaviors over time. In essence, variation provides the mutations or traits of behavior that provide for the adaptation of groups to new

situations. Selection involves the process of evaluating one variation over another and selecting the better version.

Retention involves the process of accumulation behaviors and values in a social system. Campbell's theory functions at the social system level because individuals eventually die, but institutions and conducts are retained within social systems. Campbell further argued that urban social complexity has come about through social evolution rather than through socio-biological evolution.

Cooperation is also described by Wikipedia (nd) as the process by which the components of a system work together to achieve the global properties. In other words, individual components which appear to be "selfish" and independent work together to create a highly complex, greater-than-the-sum-of-its-part system. Examples can be found all around us. The components in a cell work together to keep it living. Cells work together and communicate to produce multi-cellular organisms. Organism form food chains and ecosystems. People form families, tribes, ethnics and nations. Neurons create thought and consciousness. Atoms cooperate in a simple way, by combining to make up molecules. Understanding the mechanisms that creates cooperating agents in a system is one of the most important and least well understood phenomena in nature, though there has not been a lack of effort.

Individual action on behalf of a larger system may be coerced (forced), voluntary (freely chosen),or even unintentional and consequently individuals and groups might act in concert even though they have almost nothing in common as regards interests or goals. Examples of that can be found in market trade, military wars, families, workplaces, schools and prisons and more generally any institution or organization of which individuals are part (out of own choice by law or forced).

RELEVANCE OF THE THEORY TO THE STUDY

This study focuses on the effect of cooperative societies to agricultural production. It is within the premise of the expectations that cooperative arrangements offer the best approach to rural agriculture. Cooperation theory offers enough provisions in explaining the reasons why people come together to tackle socio-economic tasks that would seem insurmountable if not impossible for an individual to accomplish. We can thus deduce from the theory that cooperative institutions are not mere ad hoc arrangements that wind up once tasks are accomplish. Indeed, the antecedents of cooperative societies, starting from the start of modern cooperative movement via the equitable society of Rochdale Pioneers, to founding of International Cooperative Alliance (ICA) have shown the cooperative as veritable institution of change and development.

The implication of the above is that cooperatives are expected to always strive to bring about socio-economic change for which they are established and are expected to maximally bring the cooperative advantage to bear on the development of agricultural production in the study area.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The research method adopted in this study is the survey method. Thus, this research study, therefore, has been designed to enable the use of personal observation, interviews and questionnaires to gather accurate information. It will as well afford the opportunity of testing and sampling, so as to test validity of results obtained from respondents.

3.2 Area of Study

Enugu State is one of the States in the eastern part of Nigeria. The State shares borders with Abia State and Imo State to the south, Ebonyi State to the east, Benue State to the north-east, Kogi State to the north-west and Anambra State to the west. Enugu, the capital of city of Enugu state, is approximately 15 kilometers away from Port Harcourt, where coal shipments exited Nigeria. Enugu is also located within 8 kilometer from Onitsha, one of the biggest commercial cities in Africa and 6 kilometers from Aba, another very large commercial and industrial city, both of which are trading centers in Nigeria. the average temperature in this city is cooler to mild (60 degrees Fahrenheit) in its cooler months and gets warmer to hot in its warmer months(upper 80 degree Fahrenheit) and very good for outdoor activities with families and friends or just for personal leisure.

Enugu has good soil-land and climatic conditions all year round, sitting at about 223 meters (732 ft) above sea level, and the soil is much drained during its rainy seasons. The mean temperature in Enugu state in the hottest month of February is about 87.16 0F (30.64 oC), while the lowest temperatures occur in the month of November, reaching 60.54 0F (15.86 oC). The lowest rain fall of about 0.16 cubic

centimeters (0.0098 cu in) is normal in February, while the highest is about 35.7 cubic centimeters (2.18 cu in) in July.

The name of the State is derived from its Capital city, Enugu. The word "Enugu" (from Enu Ugwu) means "the top of the hill". The first European settlers arrived in 1909, led by a British mining engineer named Albert Kitson. In his quest for silver, he discovered coal in the Udi Ridge. The Colonial Governor of Nigeria Frederick Lugard took a keen interest in the discovery, and by 1914 the first shipment of coal was made to Britain. As mining activities increased in the area, a permanent cosmopolitan settlement emerged, supported by a railway system. Enugu acquired township status in 1917 and became strategic to British interests. Foreign businesses began to move into Eungu town, the most notable of which were John Holt, Kingsway stores, the British Bank of West Africa and the United Africa Company.

From Enugu the British administration was able to spread its influence over the Southern Province of Nigeria. The colonial past of Enugu is today evidenced by the Georgian building types and meandering narrow roads within the residential area original reserved for the whites, an area which is today called the Government Reserved Area (GRA).

From being the capital of Southern Province, Enugu became the capital of the Eastern Region (now divided into States), the capital of now defunct Federal Republic of Biafra, thereafter, the capital of East Central state , Anambra State, (Old) Enugu State, and now the capital of the present Enugu State with 17 local government areas through a process of State creation and diffusion of administrative authority (Ibem 2001).

The State is known for its hospitality and home for Igbo sons and daughters and non-Igbos as well and is also an agrarian State. Adada and Ugbawka Rice are some of the

farm produce, Palm wine from Nsukka and Udi is the local drink of the state. Abacha made from cassava, yam, popular Okpa Wawa etc, are some of the local foods in the State. New yam festival, odo masquerades etc are some the State cultural and traditional practices

3.3 Population of the Study

This study is on the effect of agricultural cooperative societies on agricultural production among members of agricultural cooperative societies in Enugu State. Information from the office of the Enugu State Director of Cooperatives showed that there were 288 functional and registered agricultural cooperatives in Enugu State as at October 2014, with the membership strength of 5,482. Therefore, the 288 agricultural cooperatives along with their 5,482 members, constitute the population of this study.

3.4 Sample Size and Sampling Techniques

The sampling method adopted in this study involved a combination of multi-stage and random sampling techniques, and these were done in stages.

Step 1: Selection of the cooperatives in the local government areas

Sources at the office of the Director of Cooperatives, Enugu State show that the LGAs do not have equal number of agricultural cooperative societies. In order to have a manageable number, 4 agricultural cooperative societies were randomly chosen from each of the 17 LGAs to give a total of 68 cooperatives, thus constituting the sample size for society level analysis. Non-probability sampling technique was adopted to select four (4) societies from each of the 17 local government area of the State. All the societies in each of the local government were given equal opportunity to be selected. The names of the selected ones are listed in Table 3.1.

Questionnaire Distribution

Table 3.1 QUESTIONNAIRE DISTRIBUTION AND COLLECTION ANAYSIS TABLE

S/N	Names Of Societies Selected	Que. Disted	Que. Retund	Que. Not Retund.
1	ANINRI			
	1. Success peoples (Aninri) Ethics and values Multipurpose Cooperative Society	10	8	2
	2. Real Tech (Aninri) Ethics and values(MPCS)	10	8	2
	3. Aka Amechi farm complex(MPCS)	10	9	1
	4. Uzodinma Wdeaboh farmers (MPCS)	15	9	4
2	AWGU			
	1. Prosperity (Agwu) farmers Multipurpose Cooperative Society.	10	8	2
	2. Joy of the Lord (Agwu) farmers Multipurpose Cooperative Society.	10	8	2
	3. Chikwado Akwuari Eha-Alumona cassava Fadama users.	60	42	18
	4. Osondu Agwu Ike (Agwu) farmers Multipurpose Cooperative Society.	10	10	-
3	ENUGU EAST			
	1. Kings crest Design (Enugu) farmers (MPCS).	10	7	3
	2. Greenland Agro allied (Enugu)farmers(MPCS).	15	9	6
	3. Umuigwe (Enugu) farmers (MPCS).	15	10	5
	4. Adorable (Enugu) Multipurpose Cooperative Society.	10	7	3
4	ENUGU NORTH			
	1. Economy Agro (Enugu) farmers Multipurpose Cooperative Society.	10	7	3
	2. Umu Ugwuanyi Eje farmers. Multipurpose Cooperative Society.	10	8	2
	3. Diamond star (Enugu) farmers Multipurpose Cooperative Society.	10	7	3
	4. Gapon (Enugu) farmers Multipurpose Cooperative Society.	10	8	2
5	ENUGU SOUTH			
	1. Love of God (Enugu South) farmers Multipurpose Cooperative Society.	10	8	2
	2. Holy Family farmers Multipurpose Cooperative Society.	10	6	4
	3. Great friends farmers Multipurpose Cooperative Society.	10	8	2
	4. Divine Wisdom farmers Multipurpose Cooperative Society.	10	7	3
6	EZEAGU			
	1. Lion (Iwollo) Multipurpose Cooperative Society.	10	8	2

	2. Umu-ada Ozoagu (Ezeagu) Multipurpose Cooperative Society.	35	18	17
	3. Yad-El Piggery Fadama Users Multipurpose Cooperative Society.	10	8	2
	4. Obeleagu Youth Multipurpose Cooperative Society	25	15	10
7	IGBO-ETITI			
	1.Chukwu Dubem (Ukehe) farmers. Multipurpose Cooperative Society.	11	8	3
	2.Concerned citizen (Aku) farmers Multipurpose Cooperative Society	15	10	5
	3.Ojime Youth Multipurpose Cooperative Society	16	10	6
	4. Udoka aku youths Multipurpose Cooperative Society.	10	7	3
8	IGBO-EZE NORTH			
	1. One love obidaikpe Ette Cassava growers Fadama Users.	10	7	3
	2. Chidi Aji farmer Multipurpose Cooperative Society.	10	8	2
	3. Ema Abu Ette Maize Growers Fadama User's Cooperative, Society.	10	7	3
	4. Ocheme Ette cassava Growers Fadama User's Cooperative, Society.	10	5	5
9	IGBO-EZE SOUTH			
	1. Obinwanne (Igbo Eze South) Ethics and value cooperative union.	14	9	5
	2. Njikoka-Amofia Ovoko farmers Multipurpose Cooperative Society.	17	9	8
	3. God Gift Ihaakpu Awka (Igbo Eze South) Goat realing Fadama.	15	10	5
	4. Lebechi Iheakpu Awka piggery Fadama User's Cooperative Society.	16	14	2
10	ISI-UZO			
	1. Chibueze Umumayi Agu-Amede farmers(MPCS)	10	7	3
	2. Chikwado Agu-Amiede farmers (MPCS)	10	8	2
	3. Out Okwukwe (Mbu) farmers(MPCS)	25	18	7
	4. Isufutune Hope Youths cassava Fadama Cooperative Society.	10	7	3
11	NKANU EAST			
	1. Ifedimma (Amafor-Ugbawka)Multipurpose Cooperative Society.	10	8	2
	2. Nara Inn Ethnics and value Multipurpose Cooperative Society.	10	7	3
	3. Glory of God (Enuogo Nkerefi) farmers (MPCS)	10	8	2
	4. Egbo-odo mburubu farmers Multipurpose Cooperative Society.	10	8	2

12	NKANU WEST			
	1. Out Ngozika (Obinagu Ozalla) farmers(MPCS)	10	9	1
	2. Agbani victory farmers Multipurpose Cooperative Society.	10	8	2
	3. Winners progressive Akegbe Ugwu Multipurpose Cooperative Society.	16	9	7
	4. Ofuobi Umu Ofianne Ozalla Multipurpose Cooperative Society.	10	8	2
13	NSUKKA			
	1. Liberty Group Nsukka farmer Multipurpose Cooperative Society.	10	8	2
	2. Udoka friends uwani ihegwa Ani farmers (MPCS)	10	8	2
	3. Njikoka Umabor farmers Multipurpose Cooperative Society.	10	8	2
	4. Great legend Nsukka farmers Multipurpose Cooperative Society.	13	9	4
14	OJI-RIVER			
	1. Ogbuagu (Ugwuoba) Multipurpose Cooperative Society.	10	8	2
	2. Oganiru Chukwu Umuigwe Agbihadala Achi (MPCS).			
	3. Destiny Inyi Multipurpose Cooperative Society.	12	9	3
	4. Udo bu Eze (Oji-River) Ethics and value Multipurpose Cooperative Society.	10 10	7 8	3 2
15	UDENU			
	1. Imilike Greenland Udeini farmers Multipurpose Cooperative Society.	10	8	2
	2. Oganiru Ozalla Ezimo farmers Multipurpose Cooperative Society.	10	7	3
	3. Ezioyi Owere okpu Orba farmer Multipurpose Cooperative Society.	15	12	3
	4. Chikamso women udenu farmers Multipurpose Cooperative Society	10	8	2
16	UDI			
	1. Udo Na Mma (Eke) farmers Multipurpose Cooperative Society.	15	11	4
	2. Chukwu bu Eze (Egede) farmers Multipurpose Cooperative Society.	11	10	1
	3. Ejikeme (Udi) Ethics and value Multipurpose Cooperative Society.	65	47	18

	4. Buka Ife farmers Multipurpose Cooperative Society.	10	8	2
17	UZO-UWANI 1. Igbo-Etiti forum (Uzo-uwani) Multipurpose Cooperative Society. 2. Great-ten (Adani) Micro finance Cooperative Society. 3. Udoka (Nimbo) women for women international farmers Multipurpose Cooperative Society. 4. Agada youths Multipurpose Cooperative Society	95 10 10 11	80 8 9 9	15 2 1 2
		972	737	240

Field Survey, 2015

As can be seen in the Table 3.1, 972 questionnaires were distributed to all the members of the 68 selected cooperative societies, but 737 were correctly filled and retuned representing 75%, while 240 was not retuned representing 25%. The number retuned is seen to be significant.

Step 2: Selection of the member Farmers.

The selected 68 agricultural cooperatives farmers only had a total membership of 972 farmers. Since this number was less than 1,000, a total count was decided. Therefore, the entire 972 were included in the study. The names of these societies, their membership strength, the local government areas and the agricultural zones of origin are attached as appendix II.

3.5 Sources of Data

The sources of data for this work were from both primary and secondary. The primary data was generated through oral interview conducted with Secretaries of the societies, and administration of questionnaires structured to obtain responses from the

respondents for the purpose of this work. Data obtained from primary sources were both in quantitative and qualitative forms.

Secondary information was sourced from libraries at Nnamdi Azikiwe University, Awka, Anambre State, Enugu State University of Science and Technology, Enugu. Other secondary sources included the Internet, journal articles, and official documents from the office of the Enugu State Director of Cooperatives, and Enugu State Ministry of Agriculture.

3.6 The Instrument and Instrument Administration

The major research instrument is the structured questionnaire. Two sets of the questionnaire were prepared and used in collecting data. One set was used to collect data relating to cooperative capitalization, membership and age of the societies. Other information was in respect of farm input requests and delivery; credit requests and disbursements and recovery; agricultural extension needs of members and their provision, etc. The second set of questionnaires was used to obtain bio-data of members including their farm input needs, credit obtained extension services received, and farm output figures. This questionnaire also enabled the researcher to obtain data on the perception of members on the effect of cooperative services (farm inputs, credits and farm extension services) as they relate to their farming operations. The researcher adopted Likert type five point scales which ranged from, strongly agree = 5; agree = 4; undecided = 3; disagree = 2; strongly disagree = 1.

The researcher solicited the help of Cooperative Officers in charge of the various cooperative offices in the local government areas in the distribution and retrieval of questionnaires. The decision to use Cooperative Officers was informed by the fact that they were closer to the societies and a very knowledgeable in cooperative and local agricultural production matters. Thus, they were capable of explaining salient issues in

the questionnaires to officials and members of agricultural societies, even with a minimal instruction and directives.

3.7 Validation of the Research Instrument

The research instrument was subjected to face, content, and construct validation. The topic of study, the purpose of the study, research questions, hypotheses, and the research instrument, was given to two experts at the Faculty of Management Sciences at Nnamdi Azikiwe University, Awka and the Enugu State University of Science and Technology, Enugu. They were asked to check whether or not the items were clearly stated, adequate, and suitable for eliciting the desired responses from the respondents. Necessary corrections as suggested by the experts were thereafter effected.

3.8 Reliability of the Instrument

The reliability of the instrument was determined by a test re-test method. The instrument was administered on 4 agricultural cooperatives and 20 of their members from Udi Local Government Area, Enugu State between October and November 2014. The instrument was administered again to the same respondents after an interval of two weeks. The data from the first and second responses of the respondents were correlated and Product Moment Correlation Coefficient of 0.94 which was high, suggesting that the instrument is reliable.

3.9 Data Analytical Techniques

Qualitative and quantitative analytical methods was used to realize the objectives of this research. Objectives (1) to (5) was realized through descriptive statistics such as mean, standard deviation, percentages. In objective 6, the mean of the responses from the various Likert-Scale options: strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1), was computed. The threshold of agreement for each of the variables in the questionnaire is at least 3.0. Thus, any item in the instrument

which had a mean equal to or higher than 3.0 was regarded as agree, while items with less than 3.0 were regarded as disagree.

Further analysis and test of hypotheses were undertaken through the application of One-Way Analysis of Variance – ANOVA - (hypotheses one, four and six), Cobb-Douglas production function (hypothesis two), Pearson Correlation Analysis (hypothesis three), and Ordinary Least Square (OLS) Regression (hypotheses five). Gross margin analysis was also undertaken to determine the profitability of farm operations of the respondents' farmers.

One-way ANOVA

Analysis of Variance (ANOVA) is a hypothesis-testing technique used to test the equality of two or more population (or treatment) means by examining the variances of samples that are taken.

ANOVA allows one to determine whether the differences between the samples are simply due to random error (sampling errors) or whether there are systematic treatment effects that cause the mean in one group to differ from the mean in another. Most of the time, ANOVA is used to compare the equality of three or more means, however when the means from two samples are compared using ANOVA it is equivalent to using a t-test to compare the means of independent samples.

ANOVA is based on comparing the variance (or variation) *between* the data samples to variation *within* each particular sample. If the between variation is much larger than the within variation, the means of different samples will not be equal. If the between and within variations are approximately the same size, then there will be no significant difference between sample means.

Assumptions of ANOVA:

(i) All populations involved follow a normal distribution.

(ii) All populations have the same variance (or standard deviation).

(iii) The samples are randomly selected and independent of one another.

Cobb-Douglas Production Function

The Cobb-Douglas production function enabled us to measure the marginal farm output of members. A Cobb-Douglas production function, as already mentioned above, comprises a production function of the usual regression type with a composite disturbance term. The disturbance or error term represents the effects of statistical noise (e.g., weather, measurement error, *etc*.) and systematic influences that are unexplained by the production function.

The empirical model of the production function applied in the analysis of efficiency of the production system of the cooperative farmer is specified as:

$$\log Y_{ij} = \alpha_0 + \beta_1 \log X_{1ij} + \beta_2 \log X_{2ij} + \beta_3 \log X_{3ij} + \beta_4 \log X_{4\ ij} + \beta_5 \log X_{5ij} + \beta_6 \log X_{6ij} + \beta_7 \log X_{7ij} + \beta_7 \log X_{7ij} + \varepsilon \quad (2)$$

Where

Y = Total farm output (Naira)

X_1 = Amount of credit accessed through cooperative, 2014 (Naira)

X_2 = Imputed value of farm labour assistance from fellow cooperators (Naira)

X_3 = Farm size (Hectares)

X_4 = Farm chemicals supplied by cooperative (Naira)

X_5 = Fertilizer supplied by cooperative (Naira)

X_6 = Seedlings supplied by cooperative (Naira)

X_7 = Total agricultural extension contacts through cooperative (number)

X_8 = Years in cooperative membership (number)

where α = intercept term showing value of Y when each of the values of the independent variables are zero. That is, the value dependent variable in each of the equations is predicted to have when all the independent variables are equal to zero.

$®_1$ to $®_8$ = the coefficients or multipliers that describe the size of the effect the independent variables are having on the dependent variable Y

Log denotes natural logarithm; subscripts i and j refer to the ith farm produce and the jth input respectively and ε.

In order to ascertain the effect of socio-economic variables on profitability of farming operations, a multiple regression model was estimated. The estimation technique involve the classical linear regression technique using the ordinary least square (OLS) approach. The implicit specification of this models is as follows:

Gross income = f(Age, Gend, Hosze, Marit, Educ, Frmsize, Coopyrs)(3)

Where :

Profit = Profitability indicator (Gross farm income in 2015 in Naira).

Age = Age of respondent (Years)

Gend = Gender Grouping; Male=1, Otherwise=0

Hosize = Family Size (No.)

Marit = Marital status; Married =1, Otherwise=0

Educ = Educational Level (Years of formal education)

Farmsize = Farm Size (Ha)

Coopyrs = Years of Cooperative membership

ε = the error term

The explicit specification of the model is in three functional forms are as follows:

$$\text{LogProfit} = \alpha + \text{Log}\beta_1\text{Age} + \text{Log}\beta_2\text{Gend} + \text{Log}\beta_3\text{Hosize} + \text{Log}\beta_4\text{Educ} + \text{Log}\beta_5\text{Frmsize} + \text{Log}\beta_6\text{Coopyrs} + (6)$$

where α = intercept term showing value of gross income when each of the values of the independent variables is zero. That is, the value dependent variable in each of the equations is predicted to have when all the independent variables are equal to zero.

$®_1$ to $®_8$ = the coefficients or multipliers that describe the size of the effect the independent variables are having on the dependent variable gross income.

Pearson Correlation

The Pearson Product-Moment correlation coefficient (*r*) assesses the degree that quantitative variables are linearly related in a sample. Each individual or case must have scores on two quantitative variables (i.e., continuous variables measured on the interval or ratio scales). The significance test for *r* evaluates whether there is a linear relationship between the two variables in the population. The appropriate correlation coefficient depends on the scales of measurement of the two variables being correlated.

There are two assumptions underlying the significance test associated with a Pearson correlation coefficient between two variables.

Assumption 1: The variables are bivariately normally distributed.

Assumption 2: The cases represent a random sample from the population and the scores on variables for one case are independent of scores on the variables for other cases.

Profitability Analysis

It was used to determine the profitability agricultural production and also to analyze the cost and return to cooperative farmers.

The profitability analysis is given as:

GFI = TFR – TVC (6)

NFI = GFI – TVC (7)

GM = (GFI/TFR)*100 (8)

NM = (NFI/TFR)*100 (9)

Where

GFI = Gross farm income (Naira)

NFI = Net farm income (Naira)

GM = Gross margin (%)

NM = Gross margin (%)

TFR = Total farm revenue (Naira)

TVC = Total variable cost (Naira)

TFC = Total fixed cost (N)

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

In this chapter the presentation and analysis of data collected from the field were undertaken and result are presented in the relevant tables and discussed accordingly.

4.1 Socio-Economic Characteristics of Respondents

The socio-economic profile of the members was ascertained and analyzed to enable us understand the characteristics of the members in the area. The major reason for this, is to enable us ascertain the commonality of the profile of persons who are attracted to join cooperative.

4.1.1 Age

Table 4.1: Distribution of respondents according to age.

Age	Frequency	Percentage
<30	47	6.38
30-40	300	40.71
41-50	256	34.74
51 and above	134	18.18
Total	**737**	**100.00**

Source: Field survey, 2015.

Table 4.1 indicates that the highest percentage of members (40.71%) were between the age range of 30-40 years, while 37.74% were between the age range of 41-50 years. This indicates that most members were within the active working age. Only 18.18% and 6.18 were between the age ranges of 51 years and above, and less than 30

years respectively. Therefore, it is clear that majority of the respondents were in their productive ages and any cooperative that their members are in such age range will have high rate of productivity because their members are still vibrant.

4.1.2 Gender

Table 4.2: Distribution of respondents according to sex

Gender	Frequency	Percentage
Male	403	54.68
Female	334	45.32
Total	**737**	**100.00**

Source: Field survey, 2015.

The Table 4.2 suggests that male members of the societies under study were greater in number than the female members with 54.68% and 45.32% respectively. However, the gap is not that much between male and female members which means that both sexes participated proportionally. The implication of the above is that both genders were fairly represented in the sample size. Thus, the data distribution is not chauvinistic but comprehensive, and, therefore, is all inclusive without gender bias.

4.1.3 Educational Qualification

Table 4.3: Distribution of respondents according to educational qualification

Level	Frequency	Percentage
No formal education	150	20.35
FSLC	207	28.09
WASCE/GCE	290	39.35
B.Sc degree	78	10.58
M.Sc/MA degree	12	1.63
Total	**737**	**100.00**

Source: Field survey, 2015

Table 4.3 shows that majority of the members had secondary and primary education. This was represented by 39.35% and 28.09% respectively. Small proportions of 10.58 and 1.63% had BSc and MSc/MA degrees respectively. Only 20.35% had no formal education. That majority of members had basic formal education indicates that measures by cooperative to improve agricultural production by members will be well received.

4.1.4 Marital status

Table 4.4: Distribution of respondents according to marital status

Marital status	Frequency	Percentage
Married	590	80.05
Widowed	79	10.72
Separated	68	9.23
Single	0	0.00
Total	**737**	**100.00**

Source: Field survey, 2015

Table 4.4 shows that most of the respondents are married. Indeed, 80.05% are still living with their spouses; while 10.72% were widowed and 9.23 were recorded under separated, none of the respondents was single. The interpretation here would be that most of the cooperative members are responsible and have family commitments. This could be a catalyst that would influence their readiness to participate in cooperative activities that could improve their ability to cope with household problems and challenges.

4.1.5 Family size

Table 4.5: Distribution of respondents according to household size.

Persons	Frequency	Percentage
Less than 5	160	21.71
5-10	367	49.80
11 and above	210	28.49
	737	**100.00**

Source: Field survey, 2015.

As shown on Table 4.5, 49.8% of the respondents had family sizes of 5-10 persons; 28.49% had family sizes of over 11 persons; while 21.71% had family sizes of less than 5 persons. The result on the Table indicate medium to large family sizes of the respondents. Medium to large family size is particularly important for farming families since it is a sure source of farm labour in the rural communities.

4.1.6: Farming Experience

Table 4.6: Distribution of respondents according to farming experience.

Years	Frequency	Percentage
<5	95	12.89
5-10	147	19.95
11-15	250	33.92
16-20	200	27.14
>21	45	6.11
Total	**737**	**100**

Source: Field survey, 2015

Table 4.6 shows that the respondents were experienced farmers. Only a small minority (12.89%) had farming experience of less than 5 years. Indeed, 33.9% of the respondents have been framers for 11 to 15 years, while 27.14% had farming experience of 16 to 20 years. The rest, 6.11% had farming experience of over 21 years. What is easily discernible from the above is that most of the respondents were experienced farmers, and would readily and adequately make use of opportunities provided by cooperatives in terms of input supplies, credit and extension services, to increase their farm outputs.

4.1.7 Farm Size

Table 4.7: Distribution of respondents according to farm size.

Hectares	Frequency	Percentage
<0.5	85	11.53
0.5-1.0	335	45.45
1.1-1.5	228	30.94
1.6-2.0	62	8.41
>2.0	27	3.66
Total	**737**	**100.00**

Source: Field survey, 2015

Table 4.7 reveals that all the respondents were small-scale farmers. Majority of the respondents cultivated between 0.5 and 1 hectare annually. This was represented by 45.45.3%. Also, many of them had farm sizes of majority have farm sizes of between 1.1 to 1.3 hectares (30.95%), while the rest had farm sizes of more than 2.6 hectares (3.66%) and 1.6 to 2 hectares (8.41%). It is obvious that given the small size of farm holdings, the only solution would be intensive farming that is supported by cooperatives through supply of quality inputs and extension services.

4.2 Farm Support Services from Cooperatives

Farm support services received by the respondents from their cooperatives included supply of farm inputs, credit, and marketing of farm produce.

4.2.1 Types and value of farm inputs obtained by members

Field survey in this area shows that the respondents obtained farm inputs such as fertilizers, herbicides, cassava stem cuttings and seedlings from their cooperatives in 2014 (Table 4.8). Fertilizers and seedlings appear to be the much sought after farm inputs, since all the members (100%) indicated obtaining these from their

cooperatives; while Cassava stem cutting were next with 99%. The least obtained input from the cooperative was herbicides (78.7%).

Table 4.9 shows that the total value of all farm inputs obtained by the respondents was N90, 132.21, out of the total farm input need of N131,628.97. Thus, cooperatives were able to satisfy more than 68.5% of the input needs of members. This then suggests that the respondents' reliance on the cooperative was substantial.

Table 4.8: Types of Inputs Received by Members

Items	**Frequency***	**Percentage***
Fertilizers	737	100
Herbicides	580	78.70
Cassava cuttings	730	99.05
Seedlings	737	100.00

*Multiple responses
Source: Field Survey 2015

Table 4.9: Value of farm inputs needed and obtained from cooperative in 2014

Item	Min	Max	Mean	Std. Deviation
Amount of farm inputs needed (N)	50850.00	405000.00	131,628.97	59166.76
Amount of farm inputs obtained from cooperative (N)	15307.38	405000.00	90,132.21	49354.85
Amount of inputs obtained as % of farm inputs needed			68.47	

(n=737)

*Note: Farm inputs obtained included fertilizer, herbicides, cassava cutting and seedling

Source: Survey data 2015.

4.2.2 Credit

4.2.3 In the Table 4.10, it is observed that respondents received on the average, almost N267,000 credit from their cooperatives. This represented 67.22% of the total credit need of N670,000 in 2014. This then implies that cooperative was an important source of credit to the members. It is equally seen that the respondents had repaid N211,328 of the N267,000 received in 2014. The credit repayment in 2014 represented 79.15% of the 2014 credit receipts, thereby revealing the commitment of the members to repay credits.

Table 4.10: Credit Needed, Obtained and Repaid by members, 2014

Item	Min (Naira)	Max (Naira)	Mean (Naira)	Std. Deviation
Amount of credit needed	300,000	900,000	397,164.18	172,677.02
Amount of credit obtained	60,000	750,000	266,987.79	135,020.70
Amount of credit repaid	47,400	592,000	211,328.09	105,612.76
Amount obtained as % of amount needed	-	-	67.22	-
Amount repaid as % of amount obtained	-	-	79.15	-

(n=737)

Source: Survey data, 2015.

4.2.3 Marketing

Table 4.11: Total Value and proportion of farm output marketed through cooperative, 2014

Item	**N**	**Total Value of Output in Naira**	**Mean Value of Output in Naira**	**Std. Deviation**
Total value of farm output (N)	737	328,866,675.87	446,246.77	505,952.78
Amount of farm output marketed through cooperative (N)	698	76,302,854.18	109,316.41	182,368.11
Proportion of output marketed through cooperative (%)		25%		

(n=737)

*Note: Crops marketed included maize, yam, cassava, cocoyam, maize and vegetable.
Source: Survey data 2015.

Table 4.11 shows that out of the mean value of farm produce of N446,246.77 harvested by the respondents in 2014, only N109,316.41 was marketed through cooperatives. This represented just 24.5% of the entire harvests. Farm produce marketed included maize, yam, cassava, cocoyam and vegetables, Clearly, the marketing of only a quarter of their farm produce through cooperative, implies that most members would rather sell their farm produce on their own for a better bargain. Indeed, it could be interpreted to mean that the respondents received better prices for their crops locally than what the cooperative was willing to pay.

4.2.4 Types and Frequency of Extension Services

According to Table 4.12, the respondents indicated they received farm extension services. According to the Table, these were in relation to introduction of hybrid seeds (37.99%), processing methods (31.21%), dry season vegetable cultivation (31.07%).introduction of hybrid cassava stems (27.14%), and Improved fertilizer use (16.28%).

Table 4.12: Types of Extension Services Received

Focus on extension services received	Frequency*	Percentage*
Introduction of hybrid seeds	280	37.99
Improved fertilizer use	120	16.28
Processing methods/systems	230	31.21
Introduction of hybrid cassava stems	200	27.14
Dry season vegetable cultivation	229	31.07

*Multiple responses

Source: Field survey, 2015.

The respondents also indicated the number of times they had extension contacts in 2014. As shown on Table 4.13, more than three quarters (84.12%) of the respondents reported having extension contacts of between less than three, while 13.16% indicated they had extension contacts of between 3 and 4 tines. Similarly, 58 persons or 18,71% indicated having received extension contact of more than 13 times. The least extension contacts of more than 10 times and between 7 and 10 times were indicated by 1.77% and 0.95% of the respondents respectively. Thus, these figures shows that extension services in the cooperatives in the area were not being given the required extension attention they deserve. Less than 3 extension visits in a planting season is not adequate in for raising agricultural output.

Table 4.13: Number of extension contacts

Number of extension contacts	Frequency	Percentage
<3	620	84.12
3-6	97	13.16
7-10	7	0.95
>10	13	1.77
Total	**737**	**100.00**

Source: Field survey, 2015

4.3 Relating Output to Years of Cooperative Membership

Table 4.14: Total and Average value of farm output by farmers according to years of cooperative membership.

Range in Years	N	Total Farm Output in Naira *	Mean per Member in Naira*
<5 years	347	92,611,632.06	266,892.31
6 - 10 years	210	111,536,778.56	531,127.51
11 – 15 years	90	34,130,663.02	379,229.58
16 - 20 years	41	30,544,384.80	744,985.00
>20 years	49	60,043,209.69	1,225,371.63
Total	737	328,866,668.14	446,223.44

*Revenue from main crops such as yam, cassava, palm produce and vegetables.

Table 4.14 relates the total and mean value of farm outputs in relation to the respondents' various membership years in the cooperative. It is seen that respondents who were members for more than twenty years, had an average produce per member

of over one million Naira. Those who have been members for 16 to 20 years, had a mean output of over N745,000.00. Others who have been members for 11 to 15 years and 6 to 10 years had mean outputs of N379,229.58 and N531,127.51 respectively. The least productive of all the respondents were those who have been members for less than five years, with mean output of N266,892.31.

4.3.2 Test of hypothesis one.

H_0: Agricultural output of farmers is not significantly influenced by y**ears of** cooperative membership

H_1: Agricultural output of farmers is significantly influenced by y**ears of** cooperative membership.

Table 4.15: ANOVA estimates for testing hypothesis one

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	45632868974977.55	7	6518981282139.65	7.332	.000
Within Groups	648170453564223.60	729	889122707221.16		
Total	693803322539201.10	736			

Own calculation, 2015

From the ANOVA estimates of the value of farm outputs of the various categories of years in cooperative membership presented in Table 4.15, the F ratio with a value of 7.332 is seen to be significant at 1% level. On this basis, the null hypothesis is accepted. We, therefore, conclude that agricultural output of farmers is significantly influenced by years of cooperative membership. The implication of this finding is that the more years the farmers remain as members of cooperative, the greater the chances of raising their agricultural output. It is also instructive to note that this finding is in line with the presentation in Table 4.12 it was found that the older members reported more mean value of agricultural output than newer members.

4.4 Farm Resource Use and Profitability

4.4.1 Estimated Cost and Production Functions

Table 4.16: Regression Estimates (Production Function).

Model	Coefficient Estimates	T-Value	Significance
(Constant)	218.448	10.508	0.000
Logcredit	8.983	3.617	0.000
Logfrmsize	12.925	17.663	0.000
Logchem	3.763	8.528	0.000
Logfert	0.275	0.214	0.830
Logmem	27.108	12.539	0.000
Logfamlab	0.432	0.518	0.605
Logseedl	11.596	3.066	0.002
Logexten	2.235	0.606	0.545
R^2	0.484		
Adj R^2	0.478		
F	81.734 (Sig. @ 0.000)		
DW	1.426		

Dependent Variable: Logoutput

The estimates of R^2 and Adj. R^2 in Table 4.16 suggest that the seven variables in the production function collectively accounted for almost 50% of the variations in farm output of the respondents. F ratio was significant at 0.001 level.

From the specified variables, the elasticity's of credit, farm size, farm chemicals, seedlings, and farm labour credit were statistically significant at 0.01 levels. The estimated coefficients are the elasticity of production with respect to variables used in

production showing on average the percentage change in the value of output resulting from a given percentage in the given input. Thus, years in cooperative membership, farm size, and seedling with largest elasticity's of 27.108, 12.928 and 11.596 respectively appear to have contributed more to the production process than the other production resources: implying that a 1% increase in years in cooperative membership is associated with 27% increase in output and a 1% increase in years in cooperative membership is associated with almost 13% increase in output. Also, a 1% increase in seedling is associated with almost 12% increase in output. The elasticity of the constant was equally large (218.448), thus suggesting that the farmers may be technically efficient in the production process. Traditional theory of production stipulates that the larger the value the constant term, the more technically efficient the farmers are (Nwakolobo, 2000).

4.4.2 Test of hypothesis two.

H_0: Farm inputs, credit and extension contacts obtained from cooperative have no significant effect on farm output of members

H_1: Farm inputs, credit and extension contacts obtained from cooperative have significant effect on farm output of members

DECISION: The F ratio measuring the aggregate effect of all the explanatory variable s (farm inputs, seedling, fertilizer, chemicals, extension contacts and credit) in the production function was estimated to be 81.734, which is also significant at the 1% level of significant. On this basis, the null hypothesis is rejected and the alternate is accepted. We, therefore, conclude that farm inputs, credit and extension contacts obtained from cooperative have significant effect on farm output of members.

4.3.3 Profitability of Farm Operations.

Table 4.17: Gross and net margin analysis

Item	Mean	Std. Deviation	Std. Error
Total Farm Revenue (Naira)	**446,232.34**	**940027.53701**	**71059.40253**
Yam	169,568.29	357210.46406	27002.57296
Cassava	187,417.58	394811.56554	29844.94906
Palm produce	89,246.47	188005.50740	14211.88051
Vegetables	76,342.15	078541.85410	13342.21230
Total variable cost (Naira)	**60,888.39**	**33329.94906**	**2519.50733**
Fertilizer	55,868.54	128544.60829	9717.05903
Seedlings	25,659.41	70878.20049	5357.88834
Labour cost	43,690.35	120684.50354	9122.89096
Pesticides	3,522.22	1914.08065	144.69090
Herbicides	3,202.01	1740.07332	131.53718
Miscellaneous	19,306.18	11820.32868	893.53286
Gross Farm Income (Naira)	**294,983.63**	**692986.71153**	**52384.87144**
Gross Margin (%)	64.31	0.15525	0.01174
Total Fixed Cost (Naira)	87,404.73	731594.87095	55303.37397
Net Farm Income (Naira)	**207,579.43**	421115.80030	15511.99987
Net Margin (%)	46.46	0.24051	0.01818

(N=737)

Source: Field survey, 2015.

Table 4.17 shows that farming was profitable among the respondents. 446,232.34 from sales of yam, cassava and palm produce a total of N60,888.39 on variable cost items. Thus, they realized a net gross farm income of N294,983.63 or a gross margin of 0.64. Also when the fixed costs of N127,997.73 were taken into account, a total mean net income of N207,579.43 was realized. This equally gave a net margin of 46%. These then suggest that the farm operations of the respondents are very profitable and viable. According to Thompson in Ngini (2012) a gross margin of 60%

and a net margin of 30% are indicators of profitability evidencing that a business is in good health and efficient in its operations.

Table 4.18: Mean Gross and Net Incomes according to number of years in cooperative membership

		N	Mean(x)	Std. Deviation	Std. Error
Gross Farm Income (Naira)	**<5 years**	347	245,325.11	415335.06155	41955.17693
	6-10 years	210	263,758.31	639638.44898	63963.84490
	11-15 years	90	269,335.52	634098.77600	44287.37957
	16-20 years	41	291,379.17	560206.18999	51571.15993
	>20 years	49	318,411.38	673962.04872	45857.30904
	Total	**737**	**294,983.63**	**692986.71153**	**52384.87144**
Gross Margin (%)	**<5 years**	347	66.84	11.01441	1.11262
	6-10 years	210	63.04	29.84177	2.98418
	11-15 years	90	52.19	82.26848	5.74588
	16-20 years	41	68.41	9.96225	0.91710
	>20 years	49	68.27	12.07141	0.82136
	Total	737	64.31	0.15525	0.01174
Net Farm Income (Naira)	**<5 years**	347	177,570.20	292552.12360	29552.22721
	6-10 years	210	194665.51	353903.96574	35390.39657
	11-15 years	90	194774.08	498852.59316	34841.37642
	16-20 years	41	207123.64	326424.90008	30049.84777
	>20 years	49	239,575.63	452067.89817	30759.32443
	Total	737	207579.43	421115.80030	15511.99987
Net Margin (%)	**<5 years**	347	53.50	23.26450	2.35007
	6-10 years	210	48.70	47.73339	4.77334
	11-15 years	90	34.49	109.23128	7.62904
	16-20 years	41	55.65	18.29866	1.68453
	>20 years	49	56.65	17.54236	1.19361
	Total	737	46.41299	62.55864	2.30438

Source: Field survey, 2015.

Table 4.18 compares profitability performance of the respondents, according to number of years as cooperative members. In terms of gross income, the respondents who had been members for more than twenty years appear to have performed better than the rest with a mean figure of N318,411.38. The mean gross income of other respondents in the various categories of years in cooperative membership were N291,379 (16 to 20 years), N269,379.17 (11 to 15 years), N263,758.31 and N245,325.11 (less than 5 years). In terms of gross margin, the respondents who had

been members for over 20 years and between 16 and 20 years had gross margins of approximately 68% each. Interestingly, respondents who had been members for less than 5 years came next with almost 67% gross margin.

The net income estimates followed almost the same trend as observed in the case of gross income. The estimates appear to suggest that the older one stays in the cooperative, the better the gross income figure becomes. Indeed, the respondents who had been members for over 20 years had net income estimate of N239575.63, followed by N194,774.08 (16 to 20 years), N194,665.51 (11 to 15 years), and N177,570.20 (less than 5 years. The net margin figures equally reflected the trend we observed in the case of gross margin. The respondents belonging to the older than 29 years category had the largest net margin of 56.65%. Others are 55.65% (16 to 20 years), 34.49% (11 to 15 years), 48.70% (6 to 10 years) and 53.50% (less than 5 years). Thus, the least performers were the respondents who had been members for between 11 to 15 years.

4.3.4 Test of hypothesis three

H_0: Years of cooperative membership are not significantly related to profitability of farm operations.

H_1: Years of cooperative membership are significantly related to profitability of farm operations.

Table 4.19: Correlation analysis to test hypothesis three

		Gross income	Net income	Gross margin	Net margin	**Year in coop**
Gross income	Pearson Correlation	1	0.559**	0.981**	0.609**	**0.980****
	Sig. (2-tailed)		0.000	0.000	0.000	**0.000**
	N	737	737	737	737	**175**
Gross margin	Pearson Correlation	0.981**	0.631**	1	0.708**	**0.932****
	Sig. (2-tailed)	0.000	0.000		0.000	**.000**
	N	737	737	737	737	**737**
Net income	Pearson Correlation	0.559**	1	0.631**	0.938**	**0.420****
	Sig. (2-tailed)	.000		0.000	0.000	**0.000**
	N	737	737	737	737	**737**
Net margin	Pearson Correlation	0.609**	0.938**	0.708**	1	**0.484****
	Sig. (2-tailed)	.000	0.000	0.000		**0.000**
	N	737	737	737	737	**737**
Years in coop	Pearson Correlation	0.980**	0.420**	0.932**	0.484**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	737	737	737	737	737

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field survey, 2015.

DECISION: From Table 4.19, it is seen that years in cooperative variable was positively and significantly correlated to the profitability indicators: gross income, net income, gross margin and net margin at the 0.001 level of significance. Specifically: the correlation between gross income and years in cooperative membership was significant, r (735) = 0.980, $p < 0.001$ and the correlation between gross margin and years in cooperative membership was significant, r (735) = 0.932, $p < 0.001$. Equally, the correlation between net income and years in cooperative membership was significant, r (735) = 0.420, $p < 0.001$ and the correlation between net margin and years in cooperative membership was significant, r (735) = 0.480, $p < 0.001$.

On the basis of the above outcomes, the null hypothesis three is rejected and the alternate is accepted. We conclude that profitability in farm operations increases as one get older in cooperative membership.

4.3.7 Resource use of production factors

Table 4.20: Resource use of production factors

	N	<5	5-10	11-15	16-20	>20	All
RUE (credit)	737	1.5914	1.8878	2.2669	2.7742	2.1884	2.4936
RUE (labour)	737	1.9045	2.3566	2.4703	2.5831	2.2227	2.2738
RUE (fertilizer)	737	2.1659	2.1039	2.3316	2.6137	2.0546	2.3955
RUE (seedlings)	737	2.2933	1.7614	1.4802	2.1584	2.0532	2.4539
RUE (pesticides)	737	1.8551	2.0744	2.1745	2.7278	2.2623	2.2095
RUE (herbicides)	737	1.2685	1.9347	2.4137	2.7780	2.5853	3.1902
RUE (land)	737	1.0902	1.9885	1.9208	2.1683	2.4900	2.2900

Source: Field survey, 2015

In determining the efficiency of the inputs used, Marginal Value Product and the Marginal Factor Cost (MVP and MFC) were determined. Indeed, RUE is the ratio of MVP to MFC.

From Table 4.20, all the farm production resources were seen to be under utilized as indicated by their efficiency ratios. For example, credit is being employed below economic optimum level as indicated by its efficiency ratio 2.49 for all the respondents. So also were labour, fertilizer, seedlings, pesticides, herbicides and land.

Increasing the use of these resources will bring about optimal return in farm investments.

Nevertheless, the RUE as was estimated for the various years in cooperative categories is also indicated in Table 4.18. Respondents who had been members for 16 to 20 years were found to be more efficient than others in the use of credit RUE = 2.077).

For labour use, the RUE was 2.58, 2.47, 2.36, and 2.22 for respondents who had been members for 16 to 20 years, 11 to 18 years, 5 to 10 years, and greater than 20 respectively. Only respondents who had been members for 11 to 15 years had RUE of less than 2.00 (RUE=1.90) for labour.

The Table equally shows that all the respondents in the various categories of years of membership had RUE in fertilizer use of at least 2.0. Indeed, the respondents who had been members for less than 5 years (RUE=2.29), between 16 to 20 years (RUE=2.16) and more than 20 years (RUE=2.05) were more efficient than the rest in the use of fertilizers.

In the use of pesticides, respondents who had been members for between 16 to 20 years (RUE=2.73), more than 20 years (RUE=2.26), and between 11 to 16 years were more efficient than the rest in the use of pesticides.

For the use of herbicides, respondents who had been members for between 16 to 20 years, more than 20 years, and between 11 to 15 years were more efficient than others (2.78, 2.59 and 2.41 respectively). In terms of land use efficiency, the respondents who had been members for more than 20 years, and 16 to 20 years were more efficient with RUE of 2.49 and 2.17 respectively in land use.

4.3.7 Test of hypothesis four

H_0: There is no significant difference among cooperative members in the use of production resources in their farms.

`H_1: There is significant difference among cooperative members in the use of production resources in their farms.

Table 4.21: ANOVA to test hypothesis four

		Sum of Squares	df	Mean Square	F	Sig.
RUE (credit)	Between Groups	30.584	1	30.584	7.004	.009
	Within Groups	755.423	173	4.367		
	Total	786.007	174			
RUE (labour)	Between Groups	195.923	1	195.923	177.021	.000
	Within Groups	191.473	173	1.107		
	Total	387.396	174			
RUE (fertilizer)	Between Groups	28.103	1	28.103	11.670	.001
	Within Groups	416.616	173	2.408		
	Total	444.719	174			
RUE (seedling)	Between Groups	0.102	1	0.102	0.023	0.879
	Within Groups	759.495	173	4.390		
	Total	759.596	174			
RUE (pesticide)	Between Groups	194.354	1	194.354	173.662	0.000
	Within Groups	193.614	173	1.119		
	Total	387.968	174			
RUE (herbicide)	Between Groups	21.798	1	21.798	6.551	0.011
	Within Groups	575.654	173	3.327		
	Total	597.452	174			
RUE (land)	Between Groups	51.995	1	51.995	25.709	0.000
	Within Groups	349.880	173	2.022		
	Total	401.875	174			

DECISION: Resource use efficiency indicators for members' use of credit, labour, fertilizer, pesticides, herbicides and land by respondents according to the different categories of years in cooperative membership were found to be significant at the 1%

levels (Table 4.21). Thus, the only resource use indicator for seedlings was not significant at the conventional 5% level was seedling. We, therefore, reject the null hypothesis four and accept the alternate. We conclude here that there is significant difference among cooperative members in the use of production resources in their farms, in favour of respondents who had been members for longer years.

4.3.5 Determinants of Profitability

Table 4.22: Regression Estimates (Regression Estimates).

Model	Coefficient Estimates	T-Value	Significance
(Constant)	364,917.951	9.967	0.000
Age	487.622	1.671	0.095
Gender	40,006.067	4.011	0.000
Marital status	4,702.584	0.184	0.854
Household size	3,646.411	2.175	0.030
Education	6,135.961	6.217	0.000
Farm size	-698.809	-0.188	0.851
Years in coop	0.060	3.648	0.000
R^2	0.609		
Adj R^2	0.600		
F	12.702 (Sig. @ 0.000)		
DW	1.801		

Dependent Variable: Gross income

The estimates of R^2 and Adj. R^2 suggest that the seven variables in the model collectively accounted for 60% of the variations in gross income of the respondents (Table 4.22). F ratio was significant at 0.01% level.

Gender, household size, education and years in cooperative had direct and significant influence on gross income. The coefficients appear to suggest that a unit change in respondents gender in favour of the males results in more than N40,006 increase in

gross income; a one unit increase in the household number results in a N3,646.41 increase in gross income; a one year increase in formal education results in an increase of N6,135.96 in gross income; and an increase of one year in the membership of cooperative results in N0.060 increase in gross income. Though the years in cooperative variable had the lowest coefficient of 0.060, it still does not reduce the importance of old membership so as to be fully aware and maximally benefit from cooperative services.

4.3.6 Test of hypothesis five

H_0: Levels of profitability attained by cooperative members are not significantly influenced by their socio-economic characteristics.

H_1: Levels of profitability attained by cooperative members are significantly influenced by their socio-economic characteristics.

DECISION: Four of the seven socio-economic factors were not only positive but were also significant at the conventional 0.05 level (Table 4.22 above), thereby suggesting that they important determinants of gross income. Furthermore, the F ratio of 12.702 was significant at the 0.001 level. We, therefore, reject the null hypothesis and accept the alternate, thereby agreeing that levels of profitability attained by cooperative members were significantly influenced by their socio-economic characteristics. The import of the above finding is the fact, that it highlights the importance of the personal profiles of the members of cooperatives with regards to age, education, marital status, farming experience, etc. as equally important in bringing about successful outcome in agricultural production. Indeed, it shows that cooperative membership alone is not enough if one is to be successful as a farmer.

4.4 Perceptions on the Role of Cooperative in Agricultural Production.

Table 4.23: Perceptions of respondents on the roles of cooperative in crop agricultural production.

S/N	ITEM	MEAN(X)	STD. DEV.	REMARK
1	I always obtain farm credit at affordable interest rates.	3.1642	1.26788	Agree
2	Credit processing in my cooperatives is always fast and timely	2.9403	1.29347	Agree
3	Agricultural extension officers are always engaged by my cooperative to advise us on farm operations	3.1533	1.47243	Agree
4	Fertilizers are always made available by my cooperative at the beginning of the planting season	3.2062	1.48024	Agree
5	We always assist each other in land preparation in readiness for planting of crops.	3.1357	1.46073	Agree
6	Herbicides and pesticide are always available and affordable in my cooperative	3.2904	1.41126	Agree
7	I always get processing and marketing assistance from mu cooperative whenever the need arise.	3.0638	1.33819	Agree
8	I always have access to distance markets through my cooperative	3.6160	1.11214	Agree
9	My cooperative enables to have access to hybrid seeds and seedling for increased productivity	3.3175	1.23892	Agree
10	Through my cooperative my farm productivity and income has increased	3.2008	1.13628	Agree
	GRAND MEAN(x)	3.2088	.66614	Agree

(n=737)

Source: Field survey, 2015

The perceptions of the respondents depicting role of cooperative in the farm production process by the respondents in Table 4.23. Based on the 3.0 threshold of acceptance, the mean scores and standard deviations for all items show an agreement with all the items, except one. Specifically, the respondents agreed that agricultural extension officers engaged to advise farmers on farm operations but not often; fertilizers are always made available in the cooperative at the beginning of the planting season; members always assist each other in land preparation in readiness for planting of crops; herbicides and pesticide are always available and affordable in the cooperative; they always get processing and marketing assistance from the cooperative whenever the need arise; they always have access to distance markets through the cooperative; cooperative enables them to have access to hybrid seeds and seedling for increased productivity; and through my cooperative their farm productivity and income has increased. The only exception to the responses was that credit processing in their cooperatives is always fast and timely, which had mean rating of 2.94.

The implication of the above outcome is that there is a commonality of opinion on the contributory role of the cooperative in agricultural production. In most rural cooperatives where access to basic farm inputs and credit are scarce and/or even non-existent, cooperative is often the only source for succour.

4.3.2 Test of hypothesis six.

H_0: There is no significant difference among the different categories of membership on the contributory role of cooperative in agricultural production.

H_1: There is significant difference among the different categories of membership on the contributory role of cooperative in agricultural production.

Table 4.24: One way ANOVA estimates for testing hypothesis six

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.128	4	0.282	0.634	0.638
Within Groups	325.465	732	0.445		
Total	326.593	736			

DECISION: From the ANOVA estimates of the mean responses to the contributory role of cooperative in agricultural development of the various categories of years in cooperative membership is presented in Table 4.19. The F ratio with a value of 3.298 is significant at 0.01 level. As a result the null hypothesis is rejected and the alternate is accepted. We, therefore, conclude that there is significant difference among the different categories of membership on the contributory role of cooperative in agricultural production. The implication of this finding is that the more years the farmers remain as members of cooperative, the greater the chances of raising their agricultural output. It is also instructive to note that this finding is line with the presentation in Table 4.2.1 where it was found that the older members reported more mean value of agricultural output than newer members.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The following findings were made:

1. From the ANOVA estimates of the value of farm outputs of the various categories of years in cooperative membership, an F ratio with a value of 7.332 was seen to be significant at 1% level, thereby leading to the conclusion that agricultural output of farmers is significantly influenced by their years of cooperative membership.
2. Following an analysis of production function, an F ratio measuring the aggregate effect of all the explanatory variables (farm inputs, seedlings, fertilizer, chemicals credit and extension contacts) on farm output was estimated to be 7.454, which was significant at the 1% level of significant. The conclusion was that farm inputs, credit and extension contacts obtained from cooperative have significant effect on farm output of members.
3. The correlation between gross income and years in cooperative membership was significant, r (735) = 0.980, $p < 0.001$ and the correlation between net income and years in cooperative membership was also significant, r (735) = 0.420, $p < 0.001$. It was, therefore, concluded that profitability in farm operations increases as one get older in cooperative membership.
4. Resource use efficiency indicators for members' use of credit, labour, fertilizer, pesticides, herbicides and land by respondents according to the different categories of years in cooperative membership were found to be significant at the 1% levels. It was concluded that there was significant difference among

cooperative members in the use of production resources, in favour of respondents who had been members for longer years.

5. The F ratio of 12.702 from ANOVA in the multiple regressions on the effect of age, education, marital status, farming experience, etc on gross income was significant at the 0.001 level. Hence, the conclusion that that levels of profitability attained by cooperative members was significantly influenced by their socio-economic characteristics.
6. The F ratio with a value of 3.298 from ANOVA of the mean responses to the contributory role of cooperative to agricultural production was significant at 0.01 level. Thus, there is commonality of agreement that the more years the farmers remain as members of cooperative, the greater the chances of raising their agricultural output.

5.2 Conclusion

Results from the study have shown that cooperative is a credible platform for promoting agricultural crop production. Cooperatives have done these through their activities which ensured affordable farm inputs and credits. Members of cooperative in the area of study, without doubt rely substantially on the cooperative for farm inputs and credit. It is particularly important to observe that farm output of members, profitability and efficient use of production resources had exhibited a significant nexus to increases in years of cooperative membership. Apart from these, there is a commonality of opinions on the part of the respondents on the contributory role of cooperative on agricultural production. This affirmation is a critical indication of the high level of cooperative spirit that exists in the cooperative and shows the level of confidence they have in their cooperative. Clearly, these findings equally underpins what Campbell (1975)'s socio-cultural explanation for cooperation" that hinges on variation, selection and

retention of behaviors over time. Our deductions from the theory of cooperation that cooperative institutions are not mere ad hoc arrangements that wound up once tasks are accomplished is apt here. Membership in cooperative is not meant to be an ad hoc foray but a permanent decision to brace up to the challenges of self-help even in agricultural production. It is therefore the contention of this study that more progress will be made in farm operations if farmers stay long in cooperative membership.

5.3 Recommendations and Policy Implications

Based on the findings, the following recommendations are made to enhance role of agricultural cooperative in agricultural production in Enugu State.

1. The study has shown that the respondents rely to a large extent on their cooperatives for supply of farm inputs and credits but field interactions with the officials of some cooperatives in the area lament that inadequacy of capital may prevent them from sustaining their present performance in input supply and credit disbursements. The government of Enugu State and/or federal government agencies in the State could be of assistance the cooperative societies by offering those grants and credit to improve their capacity to continue to assist the members (farmers).
2. Cooperative members have proved their mettle as far as efficiency in the use of production resources is concerned. Government at the Federal, state and local levels should place cooperative in the fore front of their agricultural programmes in other to ensure efficient use of agricultural production resources.
3. Cooperative awareness campaigns should be embarked upon by both the government and the cooperative movement to sensitive farmers on the benefits of cooperative membership via supply of quality and affordable farm inputs.

4. Although extension contact was not a significant variable in the production function analysis in Table 4.4.1, shows that efforts are still needed by the extension agents in providing and disseminating information on improved varieties of the usual crops such as yams, cassava, oil palm and maize seedlings for adoption by the cooperative farmers. This will improve their farm yield and revenue.
5. Cooperatives should also seek to improve supply of farm inputs to their members. They should endeavour to discover new sources of quality farm inputs through government agencies, including the Ministry of Agriculture and the Agricultural Development Project (ADP) in the State. Quality farm inputs such as seedling, cassava stems and fertilizer will no doubt boost agricultural production by members of cooperative.
6. Farm income of the members could be further boosted if cooperatives are more involved in the marketing of farm produce of members, through appropriate value addition activities such as processing and packaging and disposal of the agricultural products to consumers and industrial users in the urban centers.

The researcher, therefore conclude that agricultural crop production is to enhance increase food production in Nigeria.

5.4 Contribution to Knowledge

The work has contributed the following to existing body of knowledge in agriculture, and agricultural cooperative in particular.

i. This study established that the effect of cooperative on agricultural production of members depends on his/her age of membership in cooperative.

ii. This study has also established that efficiency in the use of production resources by farmers is enhanced by membership of cooperative societies.

5.5 Suggestions for Further Research

i. It is suggested that similar research should be conducted in other agricultural producing and processing areas in other States, and Nigeria generally to validate the findings of this research.

ii. Since it has been established that the cooperative society is a veritable tool for increase food production, the study is suggesting further studies into using agricultural cooperative as youth empowerment scheme.

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APPENDIX 1

Faculty of Management Sciences

Enugu State University of

Science and Technology ESUT

Department of Cooperatives and

Rural Development

27, July, 2015

Dear Sir/Madam,

May you kindly give sincere answers to the attached questionnaires aimed at carrying out a research on the topic THE IMPACT OF AGRICULTURAL COOPERATIVE SOCIETIES ON AGRICULTURAL CROB PRODUCTION IN ENUGU STATE, NIGERIA.

The survey is entirely an academic exercise and will be treated confidentially

Thanks you for your cooperation

Yours faithfully,

OKONKWO, PAUL CHUKS.

QUESTIONNAIRE

Please complete or tick √ where appropriate.

(PART A) COOPERATIVE PROFILE: to be completed by chairman/secretary of society.

1. Name of the cooperative: _____
2. Address: _____
3. Date of first registration _____
4. Local Government Area:_____
5. Membership size:_____
6. Capitalization:_____

Farm Expenditure within 2014

1. **What is the fixed cost of operation?**
   (a) land cost
   (b) farm house cost
   (c) storage facilities cost
2. **What are the variable costs on:**
   (a) hiring tractor
   (b) planting
   (c) weeding
   (d) harvesting
3. **What are the other inputs?**
   (a) Fertilizer
   (b) Pesticide
   (c) Storages
   (d) Transportations
4. **What is the total revenue from the following farm output?**
   (a) Cassava

(b) Yam

(c) Maize

(d) Rice

5. What are the farm input provided by the societies?

(a) Tractors

(b) Harvesters

(C) Seedlings

(d) fertilizers

6. What other resources has the societies provided to members?

(a) Loan facilities

(b) Agricultural Insurance

(c) Storage Facilities

(d) Others

7. **Farm input requests before _____ and after joining society_____**

8. **Farm inputs available before _____and after joining society _____**

9. **Farm extension requests (total number): _____**

10. **Farm extension received from societies (number):_____**

Operational Issues (Farm inputs)

11. Farm input purchase conditions:

(a) Must be member of cooperative

(b) Expected to have a specified amount in the account

(e) Others (specify)

12. What was the usual range of value of farm input request?

(a) N5,000 – N20,000 [ ] (b) N20,000 – N50,000 [ ]

(c) N50,000 – N100,000 [ ] (d) N100,000 – N200,000 [ ]

(e) N200,000 and above [ ]

13. Who approves farm supply request?

(a) Chairman or management committee

(b) Chairman and committee members

(c) Stores manager

(d) Others, specify

14. Farm supply sources

(a) Open market

(b) Government agency

(c) Secondary cooperative society

(d) Others, (specify)

15. How are prices of inputs arrived at?

(a) Prevailing market price

(b) Sales at cost plus administrative margin

(c) Sales at cost

(d) Others, specify

Operational Issues (Farm Extension)

16. Farm extension service conditions:

(a) Must be member of cooperative

(b) Expected to have a specified amount in the account

(c) Others (specify)

17. Farm issues extended during farm visits:?

(a) Latest agric. technologies [ ] (b) Hybrid seeds [ ]

(c) Fertilizer applications [ ] (d) Use of chemical to control herbs [ ]

(e) Others (specify) [ ]

18. Who approves extension requests?

(a) Chairman or management committee

(b) Chairman and committee members

(c) Stores manager

(d) Others (specify)

19. Who pays for extension visits?

(a) Society

(b) Secondary society

(c) Government agency

(d) Member

(d) Others, (specify)

(PART B) MEMBERS

Section A.

1. Sex: (a) male [ ] (b) Female [ ]

2. Marital Status: (a) Married [ ] (b) Single [ ] (c) Divorced [ ]

3. Size of household: _____

4. Academic qualifications: (a) SSCE [ ] (b) NCE [ ] (c) HND [ ] (d)BSC [ ] (e) MSC [ ] (f) None [ ]

5. What is your main agric. occupation? (a) Farming [ ] (b) Agric. processing [ ] (c) Agric. marketing [ ] (d) Others, please specify _____

6. Sources of all income: (a) Yam sales [ ] (b) Livestock sales [ ] (c) Vegetable and fruit sales [ ] (d) cassava sales [ ] (e) Maize/rice sales [ ] (f) Others (specify) _____

7. Total farm income in 2014: N_____

8. Total farm/business expenditure in 2014 N_____

Section B

9. What was the value of farm inputs you needed in 2014? N_____

10. What was the value of farm inputs you obtained from your cooperative? N_____

11. What was the value of farm inputs you obtained from sources other than cooperative? N_____

12. How much credit did you apply for in your cooperative in 2014? N_____

13. How much was approved and disbursed to you? N _____

14. How much have you repaid of the previous loans from cooperative? N_____

15. How many times have you benefited from agricultural extension visits from all sources?

(a) Once [ ] (b) twice [ ] (c) thrice [ ]

(d) Others (specify)

16. How many times have you benefited from agricultural extension visits from cooperative?

(a) Once [ ] (b) twice [ ] (c) thrice [ ]

(d) Others (specify)

C, APPROPRIATENESS OF COOPERATIVE CREDIT, FARM INPUT AND EXTENSION

How do you agree with the following in your assessment of the appropriateness of cooperative farm supply, credit and extension services to your farm needs?

i. Quality farm seeds and chemical are supplied

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

ii. New farm technologies and hybrid seeds are supplied.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

iii. Loans and farm inputs from cooperatives are disbursed before the planting season.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

iv. Much of my credit needs are satisfied by cooperative.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

v. Loan/credit repayments are well spaced and in convenient installments

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

vi. . Interest rates on loans and credit are lower than conventional interest rates.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

vii. Farm issues discussed advised during extension visit are appropriate to operational needs of my farm.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

viii. Number of extension visits received is adequate

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

ix. Farm extension services from cooperative has boosted my farm outputs.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

x. Farm supplies and credit from cooperative have positive effect on my farm operations.

A. strongly agree (B) Agree (C) Disagree

D. strongly disagree

Appendix 2

17 LOCAL GOVERNMENTS IN ENUGU STATE 4 FARMER MPCS EACH

S/N	NAMES OF LOCAL GOVERNMENT AREAS	NAME OF COOPERATIVE SOCIETIES	NUMBER OF MEMBER SHIP
1	**ANINRI**	1.Success peoples (Aninri) Ethics and values Multipurpose Cooperative Society 2. Real Tech (Aninri) Ethics and values(MPCS) 3. Aka Amechi farm complex(MPCS) 4.Uzodinma Wdeaboh farmers (MPCS)	10 10 10 15
2	**AWGU**	1. Prosperity (Agwu) farmers Multipurpose Cooperative Society. 2. Joy of the Lord (Agwu) farmers Multipurpose Cooperative Society. 3. Chikwado Akwuari Eha-Alumona cassava Fadama users. 4. Osondu Agwu Ike (Agwu) farmers Multipurpose Cooperative Society.	10 10 60 10
3	**ENUGU EAST**	1. Kings crest Design (Enugu) farmers (MPCS). 2. Greenland Agro allied (Enugu)farmers(MPCS). 3. Umuigwe (Enugu) farmers (MPCS). 4. Adorable (Enugu) Multipurpose Cooperative Society.	10 15 15 10

4	**ENUGU NORTH**	1. Economy Agro (Enugu) farmers Multipurpose Cooperative Society. 2. Umu Ugwuanyi Eje farmers. Multipurpose Cooperative Society. 3. Diamond star (Enugu) farmers Multipurpose Cooperative Society. 4. Gapon (Enugu) farmers Multipurpose Cooperative Society.	10 10 10 10
5	ENUGU SOUTH	1.Love of God (Enugu South) farmers Multipurpose Cooperative Society. 2.Holy Family farmers Multipurpose Cooperative Society. 3.Great friends farmers Multipurpose Cooperative Society. 4.Divine Wisdom farmers Multipurpose Cooperative Society.	10 10 10 10
6	**EZEAGU**	1.Lion (Iwollo) Multipurpose Cooperative Society. 2.Umu-ada Ozoagu (Ezeagu) Multipurpose Cooperative Society. 3.Yad-El Piggery Fadama Users Multipurpose Cooperative Society. 4.Obeleagu Youth Multipurpose Cooperative Society	10 35 10 25
7	**IGBO ETITI**	1.Chukwu Dubem (Ukehe) farmers. Multipurpose Cooperative Society. 2.Concerned citizen (Aku) farmers Multipurpose Cooperative Society	11 15

		3.Ojime Youth Multipurpose Cooperative Society 4.Udoka aku youths Multipurpose Cooperative Society.	 16 10
8	IGBO EZE NORTH	 1.One love obidaikpe Ette Cassava growers Fadama Users. 2.Chidi Aji farmer Multipurpose Cooperative Society. 3.Ema Abu Ette Maize Growers Fadama User's Cooperative, Society. 4.Ocheme Ette cassava Growers Fadama User's Cooperative, Society.	10 10 10 10
9	**IGBO EZE SOUTH**	 1.Obinwanne (Igbo Eze South) Ethics and value cooperative union. 2.Njikoka-Amofia Ovoko farmers Multipurpose Cooperative Society. 3.God Gift Ihaakpu Awka (Igbo Eze South) Goat realing Fadama. 4.Lebechi Iheakpu Awka piggery Fadama User's Cooperative Society.	14 17 15 16
10	**ISI-UZO**	 1.Chibueze Umumayi Agu-Amede farmers(MPCS) 2.Chikwado Agu-Amiede farmers (MPCS) 3.Out Okwukwe (Mbu) farmers(MPCS) 4.Isufutune Hope Youths cassava Fadama Cooperative Society.	10 10 25 10
11	**NKANU EAST**	 1.Ifedimma (Amafor-Ugbawka)Multipurpose Cooperative Society. 2.Nara Inn Ethnics and value Multipurpose Cooperative Society.	10 10

		3.Glory of God (Enuogo Nkerefi) farmers (MPCS) 4.Egbo-odo mburubu farmers Multipurpose Cooperative Society.	10 10
12	**NKANU WEST**	1.Out Ngozika (Obinagu Ozalla) farmers(MPCS) 2.Agbani victory farmers Multipurpose Cooperative Society. 3.Winners progressive Akegbe Ugwu Multipurpose Cooperative Society. 4.Ofuobi Umu Ofianne Ozalla Multipurpose Cooperative Society.	 10 10 16 10
13	**NSUKKA**	1.Liberty Group Nsukka farmer Multipurpose Cooperative Society. 2.Udoka friends uwani ihegwa Ani farmers (MPCS) 3.Njikoka Umabor farmers Multipurpose Cooperative Society. 4.Great legend Nsukka farmers Multipurpose Cooperative Society.	 10 10 10 13
14	**OJI-RIVER**	1.Ogbuagu (Ugwuoba) Multipurpose Cooperative Society. 2.Oganiru Chukwu Umuigwe Agbihadala Achi (MPCS). 3.Destiny Inyi Multipurpose Cooperative Society. 4.Udo bu Eze (Oji-River) Ethics and value Multipurpose Cooperative Society.	 10 12 10 10
15	**UDENU**	1.Imilike Greenland Udeini farmers Multipurpose Cooperative Society. 2.Oganiru Ozalla Ezimo farmers Multipurpose Cooperative Society. 3.Ezioyi Owere okpu Orba farmer Multipurpose Cooperative Society. 4.Chikamso women udenu farmers Multipurpose Cooperative Society	 10 10 15 10

16	**UDI**	1.Udo Na Mma (Eke) farmers Multipurpose Cooperative Society. 2.Chukwu bu Eze (Egede) farmers Multipurpose Cooperative Society. 3.Ejikeme (Udi) Ethics and value Multipurpose Cooperative Society. 4.Buka Ife farmers Multipurpose Cooperative Society.	15 11 65 10
17	**UZO-UWANI**	1.Igbo-Etiti forum (Uzo-uwani) Multipurpose Cooperative Society. 2.Great-ten (Adani) Micro finance Cooperative Society. 3.Udoka (Nimbo) women for women international farmers Multipurpose Cooperative Society. 4.Agada youths Multipurpose Cooperative Society	95 10 10 11
TOTAL			**972**

NAMES OF LOCAL GOVERNMENTS IN ENUGU STATE

1	Awgu Local Government Area
2	Enugu East Local Government Area
3	Enugu North Local Government Area
4	Enugu South Local Government Area
5	Ezeagu Local Government Area
6	Igbo-Etiti Local Government Area
7	Igbo-Eze North Local Government Area
8	Igbo-Eze South Local Government Area
9	Isi-Uzo Local Government Area
10	Nkanu East Local Government Area

11	Nkanu West Local Government Area
12	Nsukka Local Government Area
13	Oji-River Local Government Area
14	Udenu Local Government Area
15	Udi Local Government Area
16	Uzo-Uwani Local Government Area
17	Aninri Local Government Area

ENUGU EAST AGRICULTURAL ZONE

1	**ENUGU EAST** 1. Umuchigbo 2. Mbulujodo 3. Ogbeke Nike 4. Mbulu Owehe
2	**ENUGU SOUTH** 1. Ogbeagu Ugwuaji 2. Amechi Uwani 3. Amechi Awkunanaw 4. Obeagu Amechi
3	**ENUGU NORTH** **1.** Uwani **2.** Ogui Nike **3.** Independence layout **4.** New Haven
4	**NKANU EAST** 1. Isiogbo Nara 2. Mburubu 3. Okeani Aniyi Amagunze 4. Umuode
5	**NKANU WEST** 1. Obe Uno 2. Umuigbo Amurri

	3. Ndiagu obuoffia 4. Obeagu Ozalla
6	**ISI-UZO** 1. Akpuoga Mbu 2. Umualor 3. Mgbuji 4. Mbu Agu Udene

ENUGU WEST AGRICULTURAL ZONE

1	**AWGU** 1. Ngene Ugbo 2. Eziama Ogbaku 3. Nkpulato Mgbowo 4. Enuguoke Ihe
2	**ANINRI** 1. Agbada Nenwe 2. Amagu Oduma 3. Okpanku 4. Oduma Achara
3	**EZEAGU** **1.** Ogulogu Olo **2.** Eziowa Aguobu Owa **3.** Aguobu Umumba **4.** Aguobu Iwollo
4	**OJI-RIVER** **1.** Okpuno Agude **2.** Agbada Inyi **3.** Enugu Agu Achi **4.** Enugu Akwu Achi
5	**UDI** 1. Uwani Amokwe 2. Orji Amokwe 3. Eke. 4. Abia

ENUGU NORTH AGRICULTURAL ZONE

1	**IGBO-ETITI**

	1. Ozalla Uwelu 2. Onyoghur 3. Idoha 4. Umunko
2	**IGBO-EZE NORTH** **1.** Okata **2.** Olido **3.** Oricha Enugu **4.** Amachalla
3	**IGBO EZE SOUTH** 1. Isiagu Iheagwa 2. Nkalagu obukpa 3. Alor Agu 4. Agu iheakpu Awka
4	**NSUKKA** 1. Ozi edem 2. Anuka 3. Nkpunano 4. Ezebunagu
5	**UDENU** **1.** Imilike Etiti **2.** Umundu **3.** Obolo Etiti **4.** Obollo Affor
6	**UZO UWANI** **1.** Eziora **2.** Uvuru **3.** Adani **4.** Ojjor.