CONTRIBUTIONS OF CASSAVA ENTERPRISE TO SOCIO-ECONOMIC STATUS OF ENTREPRENEURS IN SOUTH-EASTERN NIGERIA

BY

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This thesis is dedicated to MOST HIGH GOD, the source of all knowledge and wisdom

ABSTRACT

Cassava, being an important staple, is widely grown in Nigeria. Potential contribution of Cassava Enterprise (CE) to Socioeconomic Status (SES) of entrepreneurs is threatened by fluctuation and unpredictability of cassava production, processing and marketing activities. Information on contributions of CE to entrepreneurs' SES is scanty. Therefore, contributions of CE to entrepreneurs' SES in south-eastern Nigeria were investigated.

Multistage sampling procedure was used to select respondents for the study. Imo and Anambra states were selected from five south-eastern states of Nigeria due to high involvement in CE. Systematic sampling procedure was used to randomly select 20% of registered cassava producers (81, 54), processors (51, 36) and marketers (50, 36) groups from Imo and Anambra states respectively resulting in 308 entrepreneurs. Interview schedule was used to collect data on respondents' personal characteristics, enterprise characteristics, extent of involvement in CE, benefits derived and constraints to involvement in CE. Indices of benefits (0-57.5 is low, 57.6-74.9 is moderate and 75-77 is high), involvement (2-4.8 is low, 4.9-10 is high) and SES (110-154.07 is low, 154.08-168.16 is moderate and 168.17-169 is high) were generated for analysis. Data were analysed using descriptive statistics, ANOVA and regression analysis at $p = 0.05$.

Annual income, age and years of experience in CE were ₦24965.1±75.59, 55.69±6.792 and 36.78±9.942 respectively. Most respondents were females (77.9%), married (95.8%) and had formal education (67.2%). Most entrepreneurs (83.4%) were highly (4.9±1.6) involved in CE. Most producers of fresh tubers (87.4%) and stem cuttings (76.1%) operated on small scale of 309.1±358.4 bags/season and

259.6±289.6 bundles respectively. *Garri* (97.7%) and *fufu* (98.8%) were processed at small scale of 81.9±20.6 and 46.4±26.1 bags/season respectively. Stem cuttings (85.1%) fresh tubers (96.6%), *fufu* (97.6%) and *garri* (97.7%) were marketed at small scale of 192.3±91.6 bundles, 745.2±96.9, 88.1±10.3 and 89.7±24.9 bags/season respectively. Major constraints of entrepreneurs were lack of credit (93.8%) and technical knowledge (96.1%). Food security (92.6%), improved diet (73.7%) and recognition in the society (85.7%) were major benefits derived by entrepreneurs. Producers (67.3±8.7) and marketers (67.2±7.4) had higher benefits from CE than processors (63.7±9.5) but it was not significant. The SES for marketers (162.8±3.1), producers (161.0±7.2) and processors (159.7±8.8) were essentially moderate. Experience (β = 2.638), benefits derived (β = 3.247) and income (β = 3.103) significantly increased producers' SES. Marketers' SES was significantly increased by constraints (β = - 3.248) and benefits derived (β = 3.279). Processors' SES was significantly enhanced by income (β =3.120), years of experience (β = 2.095), and benefits (β = 5.867).

Income and benefits derived from cassava enterprise were the two major factors that enhanced the socio-economic status of the entrepreneurs.

Keywords: Cassava enterprises, Entrepreneurs' socio-economic status, *Garri* production

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Oscar Titus Ikwuakam

CERTIFICATION

I certify that this research work was carried out under my supervision by Mr. Oscar Titus Ikwuakam in the Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria.

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ADP	-	Agricultural Development Programmes
ANT	-	Actor-Network Theory
APMEU	-	Agricultural Projects Monitoring and Evaluation Unit
BNARDA Authority	-	Benue State Agricultural and Rural Development
CBB	-	Cassava Bacterial Blight
CBN	-	Central Bank of Nigeria
CE	-	Cassava Enterprise
CEDP	-	Cassava Enterprise Development Project
CMD	-	Cassava Mosaic Disease
COSCA	-	Collaborative Study of Cassava in Africa
CSMS	-	Cassava Supply Management System
DATCO	-	Dutch Agricultural and Trading Company
DGIS	-	Directorate General for International Cooperation
EU	-	European Union
FACU	-	Federal Agricultural Coordinating Unit
FADAMA	-	Hausa word for the low-lying flood-prone lands found n the plains of - rivers
FAO	-	Food and Agricultural Organization
FIIRO	-	Federal Institute of Industrial Research
FMANR	-	Federal Ministry of Agriculture and natural Resources
FMARD	-	Federal Ministry of Agriculture and Rural Development
FMST	-	Federal Ministry of Science and Technology
FOS	-	Federal of Statistics

FOS	-	Federal Office of Statistics)
FS	-	Farming Styles
GDP	-	Gross Domestic Product
HQCF	-	High Quality Cassava Flour
IAASTD	-	International Assessment of Agricultural Knowledge, Science and Technology for Development
IFAD	-	International Fund for Agricultural Development
IFDC	-	International Fertilizer Development Center
IITA	-	International Institute for Tropical Agriculture
MARKETS	-	Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites
MHNR	-	Ministry of Health and Nutrition of Nigeria
NCAM	-	National Centre for Agricultural Mechanization
NDDC	-	Niger-Delta Development Commission
NISER	-	National Institute for Social and Economic Research
NPFS	-	National Programme for Food Security
NRCRI	-	National Root Crop Research Institute
NRI	-	National Resource Institute
PCU	-	Project Coordinating Unit
RMDRC	-	Raw Materials Research and Development Council
RTEP	-	Root and Tuber Expansion Project
SES	-	Socioeconomic status
SPDC	-	Shell Petroleum Development Company
UNS	-	United Nations System
USAID	-	United States Aid for International Development

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Cassava, once a neglected crop in some places, is fast becoming an elite food crop in sub-Saharan Africa (Phillips *et al*., 2004). It is a cheap and reliable source of food for more than 700 million people in Sub-Saharan Africa (FAO, 2005) as well as Africa's second most important food staple, after maize in terms of calories consumed (Nweke, 2004). Cassava's combined abilities to produce high yields under poor conditions and store its harvestable portion underground until needed make it a classic "food security crop" (Nweke 2003, Ezedinma *et* al., 2006). The stem is used for plant propagation, while the roots are typically processed into garri, chips/flour, fermented paste (fufu) and starch for human consumption and industrial use (Akoroda, 2010). The leaves can be consumed as vegetable, or dried and fed to livestock as a protein feed supplement. The processed secondary products of industrial market value include chips, pellets; flour, adhesives, alcohol and starch are vital raw materials for livestock feed, alcohol/ethanol, textile, confectionery, wood, food and soft drinks industries. These products are tradable in both domestic and international market. Akoroda and Terri (2004) see these characteristics as reasons for the attraction of cassava enterprise to most entrepreneurs in Nigeria.

Cassava's unique socio-economic potentials could also be the upward push for worldwide production that doubled in the last 30 years, reaching 213 million tonnes in 2005 with Africa accounting for more than 50%, (118 million tonnes) of the production (FAOSTAT, 2009). This is nearly 70% increase, compared with the 70

million tonnes produced in 1990. In West Africa, production is reported to have doubled from 25.8 million tonnes in 1990 to 52.3 million tonnes in 2004 and nearly two thirds of this total (38.3 million tonnes) is from Nigeria. Nigeria is also revealed to be a leading producer of cassava globally; harvesting from 3.81 million ha; a 45.72 million tonnes in 2006, 18% higher than its production in 2004 (FAOSTAT, 2009). This figure is triple more than production in Brazil and almost double the production of Indonesia, Thailand, the Democratic Republic of Congo, Ghana, Madagascar, Mozambique, Tanzania and Uganda. Interestingly, South-east is among the zones that produce the bulk of cassava in Nigeria (PCU, 2003). IITA (2004) corroborated this stating that north central zone produced over 7 million tonnes of cassava annually; South-south produced over 6 million tonnes while South-west and South-east produced just less than 6 million tonnes a year.

The increase came due to the interventions of Nigeria government and some developmental agencies (Ogundari and Brummer, 2010). In 1940, the Gold Coast hybrid was introduced to combat African Mossaic Virus and boast production while Federal Institute for Industrial Research in Cassava Plant was launched in Lagos in 1968.

The IITA in 1971 began root and tuber improvement programme in Ibadan and Special Government Programme on Maize and Cassava Production was launched with import restriction in 1982. Between 1983 and 1986, IITA introduced high yielding, early bulking varieties resistant to cassava mosaic disease (CMD) and cassava bacterial blight (CBB).

The years 1987, 1996 and 1997 recorded IFAD Cassava Multiplication Project and Nigeria Crop Marketing Board started and ended with this period. Other

intervention of IFAD in 2001 was on Roots and Tuber Crops Expansion which resulted in sporadic increase in cassava output.

The Nigeria government facilitated the development of new disease-resistant cassava varieties by the joint efforts of IITA, National Root Crops Research Institute (NRCRI), Root and Tuber Expansion Programmes (RTEP), and the Federal Ministry of Agriculture, in conjunction with State Agricultural Development Programs and cassava farmers. Another wave of cassava transformation began with the Presidential Initiative on Cassava in 2003. The initiative sought to position cassava as a commodity crop and foreign exchange earner, beyond its traditional role as a food crop through a number of projects such as building flour and sweetener processing factories in the country, dissemination of over 100 million bundles of certified stock of improved cassava, establishing multiplication centers across the country to facilitate farmers access to improved cassava varieties, training of local fabricators by the National Centre for Agricultural Mechanization (NCAM) and other relevant agencies to build and sell thousands of grating, dewatering, and drying machines. As a result of this, Ogundari and Brummer (2010) cited in Ogunleye and Oladeji (2012) reported that cassava production increased between 2000/2001 to 2005/2006 farming seasons and later stagnated.

Consequently, the current government through her Agricultural Transformation Agenda (ATA) has picked up cassava as important agri-business by adopting the policy of 10% inclusion of cassava flour into wheat flour for baking (Sanogo and Adetunji, 2008). This is in addition to USAID and Netherlands' Directorate General for International Cooperation's (DGIS) intervention to build cassava value-added chains for starch, sweeteners, and high quality cassava flour (HQCF) and the Cassava + Initiative launched by the International Fertilizer

Development Center (IFDC) and Dutch Agricultural and Trading Company (DATCO) with funding by the DGIS. The cassava + or beta carotene varieties of cassava was a move to correcting individual and household vitamin A deficiency and a mission to shift cassava from a subsistence crop to a cash crop in addition to developing agro-dealers and other farm service providers.

As an important agro enterprise, cassava enterprise is understood to have a vertical chain in the commodity flow and shows links between producers and consumers through the processes of buying, processing and marketing the commodity. NISER (2001) sees the profitability of cassava enterprise as cutting across the flow of producers, processors and marketers; generating cash income in comparison with other staples, alleviating poverty and improving the socio-economic status of entrepreneurs. Socio-economic status, sometimes shortened to (SES), is an economic and sociological indices combined to measure a person's or family's work experience, economic and social position relative to others, based on income, material possession, education level, and social status in the society (Marmot, 2004). However, since socio-economic factors are important to productivity of any population either positively or negatively (Apata, 2007), it is imperative that the contributions of cassava enterprise to socio-economic status of entrepreneurs (producers, marketers and processors) in South-eastern Nigeria be determined.

1.2 Statement of the research problem

Cassava has played and continues to play a remarkable role on the agric-business stage of Nigeria. Since its introduction into Nigeria in the 1600s, cassava has moved from a minor crop status to a major crop that accounts for between 40 and 50% of all calories consumed in Southern and Central Nigeria (Maziya-Dixon, 2001).

It constitutes a major item in the crop combination of most farmers and contributes significantly to total farm income in Nigeria. The profitability of the crop has been the focus for various intervention programmes in Nigeria (Ogunleye and Oladeji, 2012). These interventions in cassava production were aimed at driving development in cassava sector through value-addition and building support around farmers, marketers and processors by tackling existing technical and policy challenges yet it has been reported that the sub-sector has remained predominantly (99%) at subsistence level (FAOSTAT, 2010). Similarly, Nigeria is the world's largest producer of cassava with estimated 36.8 million metric tons on a total harvested area of 3.13 million ha in 2009 (FAOSTAT, 2010). Studies also revealed that most of Nigeria's population is chronically hungry and economically back-ward (Iheke, 2008). It is expected therefore that Nigeria's level of production will be a boost to Socio-Economic Status (SES) of those involved in the nation's cassava enterprise. On the contrary, research has further shown that the SES of those involved is not significantly improving as most Nigerians are poor and hungry (Philip *et al*, 2004, Simonyan *et al.*, 2010). There should supposedly be a correlation between production levels attained and change in the SES of those involved in the cassava enterprise.

High cost of cassava production has remained a major reason why cassava produced in the country is less competitive in the international market and only good for local consumption (Yomi, 2006). This is unlike what obtains in Indonesia where production is not up to half of Nigeria's, but the country maintains largest exporter of cassava products in the world (FIIRO, 2006). The issues that revolve around scale of operation, level of involvement and SES of entrepreneurs in cassava enterprise need to be critically assessed to bring out the explanatory factors for attained production level and SES of those involved in south eastern Nigeria.

The issue of who among the entrepreneurs have higher SES in cassava enterprise needs to be ascertained. Such information gap is a reason why appropriate packaging, channeling and distribution of incentives are difficult in the study area. On the other hand, whereas; government and non-governmental interventions in cassava enterprise are typically cited in literature as means of encouraging involvement in cassava enterprise, entrepreneurs' access to those interventions are rarely mentioned. It is obvious that access to intervention is important to necessitating substantial benefits from cassava enterprises and improved SES of entrepreneurs. Evidence also suggests that agro-enterprises generally are bedeviled by numerous constraints (Nwosu and Onumadu, 2008). Therefore, effort at determining specifically those of cassava enterprise is germane and a step in proffering solutions to improving entrepreneurs' productivity, benefits and socio-economic status. All these lead to the following research questions:

1. What is the entrepreneurs' level of involvement in cassava enterprise in the study area?
2. What is the level of access of entrepreneurs to intervention programmes inputs for cassava enterprises in the study area?
3. What are the constraints to cassava enterprise in the study area?
4. What are the benefits derived by entrepreneurs in cassava enterprise in the study area?
5. What is the socio-economic status of entrepreneurs in cassava enterprise in the study area?

1.3 Objectives of the study

The general objective of the study is to determine the contributions of cassava enterprise to the entrepreneurs' socio-economic status in the study area.

The specific objectives are to:

1. examine entrepreneurs' level of involvement in cassava enterprise in the study area
2. determine entrepreneurs' access to intervention programme input for cassava enterprise in the study area
3. identify constraints to cassava enterprise in the study area.
4. determine the relative benefits entrepreneurs derive from their involvement in the cassava enterprise
5. ascertain the different socio-economic status of entrepreneurs in cassava enterprise in the study area

1.4 Hypotheses

Socio-economic characteristics of the entrepreneurs are expected to have significant relationship with their socio-economic status. This conjecture became necessary giving the findings of Nwaru (2004), Ironkwe, Ekwe, Okoye and Chukwu (2009), Nweke *et al.* (2009) who established significant relationship between some selected socio-economic characteristics (age, household size, benefits and years of experience) and socio-economic status of farmers. It is noteworthy to state that these studies were carried out among farmers other than cassava entrepreneurs (producers, processors and marketers). This makes it imperative for this work to assess with a view to establishing the interconnectivities between cassava entrepreneurs' selected socio-economic characteristics and their socio-economic status.

Another important interrelationship that this study attempts to establish is between benefits in cassava enterprise and entrepreneurs socio-economic status. Niser (2001), FAO (2002), Nweke (2002), Aye (2006) and Ogbonna and Asumugha (2009) established significant relationship between income, food security, employment opportunity and improved nutrition as having significant relationship with the socio-economic status of rural farm households. It is therefore logical to assume that all things being equal, these variables will influence a change in the socio-economic status of entrepreneurs in cassava enterprise.

Access to intervention progammes in cassava enterprise is also conjectured to have significant relationship with the socio-economic status of entrepreneurs. Improved scale of production, increased benefits, a reliable and convenient source of food, as well as change in socio-economic status are reported to be the result of cassava farmers having access to appropriate technology in Africa (Nweke, 1994, Nweke *et al*., 2001). It is therefore against this background that it is expected that intervention programmes in cassava enterprise may have a significant correlation with socio-economic status of entrepreneurs.

Finally, level of production, income (returns), benefits, constraints, and experience and farm size are assumed to be possible predictors of entrepreneurs' socio-economic status. This is sequel to the findings of FAO, (2005), Eze, (2006), Nwosu and Asumugha, (2007), Ogbonna and Asumugha, (2009), Agwu, (2009) that these variables are among the determinants of categories of rural farmers' living standard.

It is therefore on this premise the following hypotheses stated in the null form were tested in this study:

1. There is no significant relationship between selected socio-economic characteristics of entrepreneurs in cassava enterprise and their socio-economic status.
2. There is no significant relationship between entrepreneurs' level of involvement in cassava enterprise and their socio-economic status.
3. There is no significant difference in the socio-economic status of different categories of entrepreneurs in cassava enterprise.
4. There is no significant relationship between the relative benefits entrepreneurs derive from cassava enterprise and their socio-economic status.
5. There is no significant difference in the benefits derived by different categories of entrepreneurs in cassava enterprises
6. There is no significant relationship between entrepreneurs' access to intervention programmes in the cassava enterprise and their socio-economic status.
7. There is no significant contribution of selected independent variables to the socio-economic status of categories of entrepreneurs.

1.5 Significance of the study

Over the years, cassava has been transformed into a number of products for both domestic and industrial uses across the country. There are indications that the domestic demand for cassava, particularly as a staple food, tends to outweigh the demands by the industrial sector. It is believed however, that the outcome of the study will improve government policy in this direction as well as direct marketing and pricing on cassava and cassava products.

Perhaps various studies conducted in Nigeria and other parts of the world may have revealed the socio-economic gains of cassava enterprise. However, since this phenomenon is location specific and intertwined with a society's culture, or preferences and economy, it is important to uncover that of south eastern Nigeria. This will help fill the gap in such an agrarian zone of the South eastern Nigeria.

Research institutions on their own part will further be challenged to develop improved planting materials, cultural practices, pests and disease control mechanisms and appropriate post-harvest technology prototypes that are cost-effective, easy to fabricate, operate and maintain at the farm level without electrical or petroleum sources of energy. The aim would be to save labour and cost, improve the efficiency of production, quality of products and marketability of cassava products.

In the same vein, both government (federal, state, local government) and non-governmental organizations will be challenged into identifying broad based intervention programmes that would contribute significantly towards alleviating the production, utilization, processing and marketing/distribution constraints to cassava enterprise thereby enhancing and sustaining their socio-economic gains.

The findings of the work will be an evidence base for proactive measures and a formidable source of policy direction, formulation and implementation to government, non-governmental and other agencies/outfits. The findings will further aid those involved in rural and agric-business development programmes under the Agricultural Transformation Agenda of Federal Government of Nigeria.

It is obvious that Agricultural Transformation Agenda of the government was initiated and pursued along value addition of agricultural production as it relates to cassava enterprise. Thus; the findings of the study will facilitate support building as well as assist relevant stakeholders in addressing constraints along the value chain of

entrepreneurs in cassava production, processing and marketing. This is with a view to achieving the transformation agenda of the present government. It will also aim at ensuring that rural and agric-business development policies are carried out in a manner to assist people see and utilize opportunities at their disposal and as may be provided by the cassava enterprise.

Finally, the outcome of the study would provide an easy reference material at continental, regional, national, and state levels. This will create a basis for improved provision of technical advice and support to entrepreneurs in cassava enterprise as well as provide a benchmark for future policy intervention in the sub sector.

1.6 Conceptual definition of terms

Socio-economic Status (SES): Socio-Economic Status (SES) is the position that an individual or family occupies with reference to the prevailing average standards of cultural possessions, income, material possessions and participation in group activities of the community.

Cassava enterprise: A cassava enterprise is an agribusiness with many coordinates that produces, processes, markets and or distributes services or products for the purpose of making profits from the operations.

Entrepreneurs: Entrepreneurs are individuals and or groups of people with direct interest, involvement or investment to mobilize resources necessary to manage cassava enterprise for the purpose of wealth creation.

Intervention programme: Intervention programmes are systematic developmental activities and approaches initiated and aimed at addressing issues and solving societal problems as well as improving people's living standard.

CHAPTER TWO

LITERATURE REVIEW

2.1 Historical perspective of cassava in Nigeria

Cassava, (*Manihot esculenta crantz*), is a perennial, vegetative propagated shrub, grown throughout the lowland Tropics. Originating in Tropical and Sub-Tropical areas of Central and South America, cassava arrived in Africa at the end of the sixteenth century. Cassava is thought to have made its entry into Nigeria in the late 17th century through the island of Sao Tome and Farnando Po (Agbola, 1976) and has since become widely distributed throughout the country.

Nigerian cassava production is by far the largest in the world; a third more than production in Brazil and almost double the production of Indonesia and Thailand. Its production in other African countries, the Democratic Republic of the Congo, Ghana, Madagascar, Mozambique, Tanzania and Uganda appears small in comparison to Nigeria's substantial output. The Food and Agriculture Organization (2004a) has in 2002 estimated cassava production in Nigeria to be approximately 34 million tonnes. Comparing also the output of various crops in Nigeria, cassava production ranks first, followed by yam production at 27 million tonnes in 2002, sorghum at 7 million tonnes, millet at 6 million tonnes and rice at 5 million tonnes (FAO, 2004a).

By zone, the North Central zone produced over 7 million tonnes of cassava a year (1999 to 2002). South-South produces over 6 million tonnes a year while the South West and South East produce just less than 6 million tonnes a year. The North West and North East are small by comparison at 2 and 0.14 million tonnes

respectively (PCU, 2003). On a per capita basis, North Central is the highest producing state at 0 .72 tonnes/per person in 2002, followed by South East (0.56), South South (0.47), South West (0.34), North West (0.10) and North East (0.01) (IITA, 2004).

Extrapolating from the estimates of cassava production in Africa (Scott *et al.* 2000) and (FAO, 2004b), Nigeria's production was targeted at 40 million tonnes in 2005 and 60 million tonnes by 2020 (IITA, 2002). This target relates well to the mapping of a simple linear time trend on historical production levels. An alternative 'middle of the road' production target generated by mapping an exponential time trend to historical production levels suggested an intermediate production target for 2007 of 60 million tonnes (a doubling from early 1990 production levels) to be followed by 150 million tonnes in the year 2020 (Hillocks, 2002).

2. 2 Agronomy of cassava

Cassava adapts to a wide range of climatic and edaphic conditions. As a crop of the lowland tropics, it is grown between Latitude 30°N and 30°S of the Equator (Nweke *et al.*, 2002). Root formation is photo-periodically controlled. Consequently, root formation is enhanced by short days and delayed by long days exceeding 10 to 12 hours (Alves, 2002). The crop has been observed to tolerate air temperature of between 18°C and 35°C, an average rainfall of 500mm to 5000mm and a soil pH of 4 to 9, requiring a warm moist climate where the mean temperatures range from 25°C to 29°C and well distributed annual rainfall of between 1100 and 2000mm (Onwueme, 2000; FIIRO, 2006). Poor annual rainfall distribution however, may be offset by favourable soil characteristics such as texture, topography and drainage (Silvestre, 1989; Nweke, 1994a).

Similarly, a survey in the 1990s showed that cassava can be grown more intensively in the humid zone where it occupies about 60% of the staple crop field than in the sub-humid zone (less than 20%) and in the non-humid zone (5%) (Nweke,1999). The favourable climatic conditions that prevail in and around the agro-ecological zones are one big factor for production of the crop in Nigeria.

2.3 Benefits of cassava enterprise

Cassava has been growing in economic importance over the years and in recent times. Its recognition in producing and consuming countries for industrial development is also increasing. According to FAO (2002) cassava plays a vital role in the food security of the rural economy due to its capacity to yield under marginal soil conditions and its tolerance to drought. Analysis of profitability and value chain indicators of cassava has attracted attention in Nigeria not only because the commodity is assuming increasing economic importance in terms of domestic and industrial demand but also due to the current policy attention being focused on export of cassava products. With regard to profitability, studies have shown that cassava enterprises are quite profitable. According to NISER (2001), cassava production is profitable under the traditional and improved system of production. The contribution of cassava enterprise by geopolitical zones in Nigeria shows that the southern states account for 64% of the cassava produced in Nigeria (Nweke *et al.,* 2002), providing and sustaining the livelihood for over 30 million producers and countless processors, marketers and consumers (FAO, 2002).

Cassava has remained important, not only as a food crop but also as a major source of income for most rural households. Nigeria is currently the largest producer of cassava in the world with an annual production of over 34 million tonnes of

tuberous roots (PCU, 2003). It is largely consumed in many processed forms in Nigeria. Its use in the industry and as livestock feed, is well known and gradually increasing, especially now that import substitution is becoming prominent in the industrial sector of the economy. As a cash crop, cassava generates cash income for the largest number of households in comparison with other staples.

Presently, the domestic demand for cassava starch is about 130,000 tonnes per annum and 200,000 tonnes per annum for high quality cassava flour (FIIRO, 2006). The domestic demand for ethanol is 180 million liters – all ethanol is imported in Nigeria (Oshinade, 2007). Cassava is produced with relevant purchased inputs as frequently as and in some cases more frequently than other staples. A large proportion of total production, probably larger than that of most staples, is planted annually for sale.

As a food crop, cassava has some inherent characteristics which make it attractive to most entrepreneurs in Nigeria. First, it is rich in carbohydrates especially starch and consequently has a multiplicity of end users and second, it is available all year round, making it preferable to other food security and seasonal crops such as grains, peas and beans (Tewe, 1995). It has been estimated that the dietary calorie equivalent of per capita consumption of cassava in the country amounts to about 238 kcal (Cock, 1985). Compared to grains, cassava is more tolerant to low soil fertility and more resistant to drought, pests and diseases. Its roots are storable in the ground for months after maturity. These attributes combined with other socio-economic considerations are what IFAD has recognized in the crop as lending itself to a commodity-based approach to poverty alleviation (FAO/IC, 1995). APMEU (1997) also described the importance of cassava enterprise to Nigeria's socio-economic life as; provision of employment to producers, processors, marketers, food vendors and as

a food of great preference to the rich and poor in both urban and rural areas. In quantitative economic terms, APMEU (1997) revealed that the value of all cassava produced in Nigeria annually can be estimated as follows: US$2.8 billion worth of gari and US$795 million worth of fresh roots.

2.4 Intervention programmes in cassava enterprise

Cassava has played and continues to play a remarkable role on the agricultural stage of Nigeria. Since its debut in the late 1600s on Portuguese trade ships from Brazil into Nigeria, it has gone from minor crop to a major crop that accounts for between 40-50% of all calories consumed in Southern and Central Nigeria (FAOSTAT, 2010). Nigeria's production was estimated in 2009 to be 36.8 million metric tons (FAOSTAT, 2010) with total area harvest of 3.13 million ha. It is produced predominantly (99%) by small farmers with 1-5 ha of land intercropped with yams, maize, or legumes in the rainforest and savannah agro-ecologies of Southern, Central, and lately Northern Nigeria (FAOSTAT, 2010).

Systematic interventions in the cassava sector began in the early 1980s with the introduction of high yielding, early bulking varieties resistant to the cassava mosaic disease (CMD) and cassava bacterial blight (CBB), produced at the International Institute for Tropical Agriculture (IITA) in the 70s', and the establishment of small-scale processing facilities. These two key interventions increased profit margin for producers and processors alike and drove down prices of cassava food products for the rural and urban consumers. "The cassava transformation", as the rapid increase in production and marketing has been termed, spun an entire food industry and transformed the crop from a rural subsistence crop to a cash crop and urban food staple (Nweke, *et al*., 2001).

The second wave of cassava transformation began with the Presidential Initiative on Cassava, started in 2003. The initiative sought to position cassava as a commodity crop and foreign exchange earner, beyond its traditional role as a food crop. A number of projects were embarked upon to build flour and sweetener processing factories in the country. Increased productivity of cassava by small scale farmers in Nigeria was addressed via the production and dissemination of over 100 million bundles of certified stock of improved cassava varieties over a period of three years, and a fast-track farmer participatory selection of new varieties (UNIDO/FGN, 2006).

Multiplication centers were established across the country to facilitate farmers' access to improved cassava varieties. Local fabricators were trained by the National Centre for Agricultural Mechanization (NCAM) and other relevant agencies to build and sell thousands of grating, dewatering, and drying machines. Six farm-gate primary processing Centers for training extension and farmers in production of cassava flour, chips and pellets were established. State extension personnel were also trained in improved production technologies. The Presidential cassava initiative also raised the profile of cassava in Nigeria and demonstrated the immense potential of the country to increase production within a short time; from 35million tons when the program started in 2003 to as high as 45million metric ton in 2006 (http://www.Unaab.ed.ng/-/). This will stimulate an improvement in cassava enterprise as well as boost economic activities and opportunities through sustainable and competitive cassava production, processing and marketing development in Nigeria. The initiative will further strengthen human and institutional capacity of producers, processors, marketers and their scale of operation, benefit and socio-economic status.

The report also revealed that two projects financed by the USAID and Netherlands' Directorate General for International Cooperation (DGIS) have sought to build cassava value-added chains for starch, sweeteners, and high quality cassava flour (HQCF). The USAID funded project, Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) was started in 2005 to partner credible cassava processors with smallholder farmers to develop efficient value added chains for starch and sweeteners in Nigeria. The project also introduced best farming practices to lower production costs. (http//www.Unaab.ed.ng/-/). The report further showed that in Ondo state, MARKETS is partnering with MATNA Nigeria Limited, one of the two large starch mills in the country, and in Ogun State, MARKETS is working with EKHA Agro, the only cassava-based sweetener processing plant in Nigeria to build robust supply chains. Also a computer-based system called the Cassava Supply Management System (CSMS) was designed to coordinate production, harvesting, and collection of cassava from a network of approximately 400 farms per processing plant, enabling these plants to reach 60-80 percent of processing capacity in five years.

The second project, Cassava +, was launched by the International Fertilizer Development Center (IFDC) and Dutch Agricultural and Trading Company (DATCO) with funding by the Netherlands' Directorate General for International Cooperation (DGIS) (http//www.Unaab.ed.ng/-/). The three year project has as mission to shift cassava from a subsistence crop to a cash crop and is working with farmers to supply raw materials for high quality cassava flour (HQCF) in Taraba, Kwara, Kogi, Osun, and Rivers States. The projects hopes to increase productivity of 160,000 farm families by developing sustainable and productive cassava and rotation cropping systems and linking them to reliable demand via DATCO. In addition the

project seeks to develop agro-dealers and other farm service providers and link them with participating farmers (http://www.Unaab.ed.ng/-/).

Cassava transformation under the Agricultural Transformation Program of President Goodluck Jonathan as being implemented by the Honorable Minister of Agriculture, Prof. Akinwumi Adesina, seeks to build upon the gains in all aforementioned efforts. The new cassava transformation will drive development in the cassava sector through value-addition to realize opportunities that exist in the industrial and export sectors for cassava. The plan will build market and production support around farmers and processors by tackling existing technical and policy challenges (http://www.Unaab.ed.ng/-/). This demonstrates government understanding that cassava is important in improving income and food security status of most Nigeria families as well as playing a remarkable role in traditional and industrial raw materials provisions. It further implies government realization that with appropriate initiative cassava will not only be positioned as a commodity crop but also as a foreign exchange earner.

With these interventions in place cassava, in its processed form, is reported to be a reliable and convenient source of food for tens of millions of rural and urban dwellers in Nigeria (Nweke *et a*l., 2001). Also, a significant industrial demand exists for cassava but primarily as substitution for imported raw materials and semi-finished products. Nweke *et al*. (2001) further revealed that there is a potential demand of 250,000 ton/year in the High Quality Cassava Flour (HQCF), primarily from 10% replacement in bread flour and for use in bouillon, noodles, and the adhesive industry (dextrins), a demand for native and modified starches exceeds 230,000 tons/year in the food, paint, and pharmaceutical industries. In the sweetener industry, an estimated annual demand of 150,000 tons for high fructose syrup, as part replacement for

imported sugar, was also revealed by (Nweke *et al.,* 2001). The dried cassava chips value-chain has a potential demand of 900,000 tons per annum with about 300,000 tons going to the regional food market, an estimated 80,000 tons/year to the local animal feed market, and 520,000 tons destined for the China export market. According to Nweke *et al.* (2001) Nigeria has adopted the policy of blending gasoline with 10% ethanol, the E-10 policy. These represent a potential one billion liter per year market for fuel ethanol and, a potential demand of 2.3 million tons of fresh cassava roots.

2.5 Entrepreneurship in cassava enterprise

An enterprise is a concern set up by an individual (entrepreneur) for the purpose of making profit. The words entrepreneur and entrepreneurship have acquired special significance in the context of economic growth in a rapidly changing socio-economic and socio-cultural climates, particularly in industry, both in developed and developing countries. According to Adisa and Sodique (2008), an entrepreneur could be defined as person (s) who initiate, organize, and control the affairs of business units that combine the factors of production to supply goods and services, whether the business pertains to agriculture, industry, trade or professions. An entrepreneur is someone who is able to balance the economically desirable with the technologically/operationally feasible, someone who takes a calculated risk to seize an opportunity or meet a sustainable business (Robbins and Coulte,r 2005). Petrin (1991) viewed an entrepreneur as a person who either creates new methods of production, new products, new markets, new sources of supply and new forms of enterprise. Entrepreneurs are highly creative people who always try to develop new products, processes or markets. They are innovative, flexible and are willing to adopt

changes. They are not satisfied with conventional and routine way of doing things hence they involve themselves in finding new ways of doing the things for the better

On the other hand, the process of undertaking by which an entrepreneur is involved in the task of creating and managing an enterprise for the purpose of making profit is entrepreneurship (Adisa and Sodique, 2008). Entrepreneurship is the capacity to develop ideas and achieve success with them. Innovation, the acceptance of change and risk, the mobilization of resources and the tapping of opportunities are prerequisites involved in creating a competitive or sustainable enterprise. Commission of European Communities, (2003) also noted the entrepreneurial spirit is the asset responsible for creating employment, competitiveness and the potential to exploit any sector or business. This task entails raising finance, planning, organizing, controlling, commanding, and coordinating activities resources necessary to manage the enterprise.

Bernier and Hafsi (2003) described entrepreneurship as a process in which an agent manages to conceptualize and implement an idea, notion, service, product or activity. Stevenson *et al.* (1999) see it as the pursuit of an opportunity and turning a vision into reality regardless the possibilities of success. This could suggest that anyone can be an entrepreneur, or at least has the capacity to develop that vision in order to create his own enterprise.

Although, it has been observed that no ideal profile for an entrepreneur exists but certain psychological traits or characteristics are usually associated in theory with a business-minded person (Robbins and Coulter, 2005). These entrepreneurial traits are high levels of motivation and energy, skills, and the ability to set goals and take moderate risk

Other traits according to Robbins and Coulter (2005) are goals, to be autonomous and convey a message, to act quickly, to distance oneself and be objective, to create simple and practical solutions, to take risks, to have clear values, to obtain results and to act positively, exhibiting enthusiasm and optimism. Other authors such as Timmons (1989) and Filion (2000) suggest that entrepreneurs are tenacious, can live with uncertainty, make good use of resources and are imaginative, moderate risk takers and results-oriented. In the cassava enterprise, an entrepreneur is someone that either produces processes or markets not just for subsistence but is also involved in the enterprise for profit.

2.6 Types of involvement in cassava enterprises

Cassava enterprise in Nigeria has been that of the small scale type (RTEP, 2002). In 2001, it was estimated that 84% of the cassava produced in Nigeria was used as food; out of this 70% was processed into gari and the remaining 14% into other human food products, such as lafun (fermented cassava flour), fufu/akpu, abacha and tapioca (FIIRO, 2006).

Arising from the policy statement of the Federal Government of Nigeria in 1999, pledging to give among others, special attention to cassava because of its diverse values, great hope was generated among diverse stakeholders (FGN, 2002). These stakeholders include the producers, processors and marketers (FIIRO, 2006). Thus, the various types of involvement in cassava enterprise are in the areas of production, processing, marketing of cassava and cassava products (IITA, 2004).

2.6.1 Cassava production enterprise

Cassava can be grown in almost all the states in Nigeria either as a sole crop or an intercrop with principal staples, such as maize, yam, cocoyam, sweet potato, rice, sorghum, millet; and subsidiary crops, such as beans, okro and leafy vegetables. Cassava can also be grown with oil palm, rubber, cashew and cocoa within the first few years of the permanent crop before the canopy covers. In most of the southern areas of Nigeria, producers grow cassava in mixtures with maize, cocoyam, yam and vegetables but some grow it sole. In northern areas, sole cropping is more common (Clement-Ogbuanu, 2007). A recent survey in the country indicates that on the average, for all the crops, about 25 percent of the fields are sole cropped and 75 percent are intercropped (RMDRC, 2004).

Three sets of estimates exist for Nigerian cassava production from 1996 to 2002. The Food and Agriculture Organization of the United Nations (FAO) in Rome (FAO, 2004a) estimated 2002 cassava production in Nigeria to be approximately 34 million tonnes. The trend for cassava production reported by the Central Bank of Nigeria mirrored the FAO data until 1996 and thereafter rises to the highest estimate of production at 37 million tonnes in 2000 (FMANR, 1997; Central Bank of Nigeria). The third series provided by the PCU (PCU, 2003) had the most conservative estimate of production at 28 million tonnes in 2002. Comparing the output of various crops in Nigeria, cassava production ranks first, followed by yam production at 27 million tonnes in 2002, sorghum at 7 million tonnes, millet at 6 million tonnes and rice at 5 million tonnes (FAO, 2004a). Expansion of cassava production has been relatively steady since 1980 with an additional push between the years 1988 to 1992 owing to the release of improved IITA varieties. By zone, the North Central zone produced over 7 million tonnes of cassava a year (1999 to 2002). South-South produces over 6

million tonnes a year while the South West and South East produce just less than 6 million tonnes a year. The North West and North East are small by comparison at 2 and 0.14 million tonnes respectively (FAO, 2004a).

On a per capita basis, North Central is the highest producing state at .72 tonnes/per person in 2002, followed by South East (.56), South-South (.47), South West (.34), North West (.10) and North East (.01). National per capita production of cassava is .32 tonne/per person. Benue and Kogi state in the North Central Zone are the largest producers of cassava (IITA, 2004). Cross River, Akwa Ibom, Rivers and Delta states dominate state cassava production in the South South. Ogun, Ondo and Oyo states dominate in the South West and Enugu and Imo dominate production in the South East. Kaduna alone in the North West is comparable in output to many of the states in the southern regions at almost 2 million tonnes a year with very little currently produced, in the North East.

Cassava production in Nigeria, however, is reported to be increasing at 3% every year and with increasing import of starch, flour and sweeteners that can be made from cassava (Nweke, 2001). This paradox is due to how cassava is produced, marketed, and consumed in Nigeria, in a largely subsistence to semi commercial manner. According to Clement-Ogbuanu (2007) cassava production in Nigeria is largely in the hands of smallholders who operate about 87 percent of the total cultivated land area while the medium holding farms constitute about 10 percent, and the large-scale farms make up the remaining 3 percent. This finding corroborates the earlier report of Azogu, *et al.* (2004) that although Nigeria is the world leader in cassava production, the country is not an active participant in cassava trade in the international markets because most of her cassava is targeted at the domestic food market and production methods primarily subsistence in nature to support industrial

level demands. Thus, any surplus cassava is either processed on the farm, or sold to local processors. It also implies low profit margin as well as entrepreneurs' inability to move from subsistence level of production to commercial status thus engendering poverty.

In cassava enterprise, the producer is concerned with primary cassava production and ends with the sale of a raw fresh tubers and or stem cuttings at the farm gate or local market. These transactions may occur literally at the farm gate or at some other point where the producers hand over sale ownership of the produce to the next value chain participant. However, depending on situation, some type of primary processing (such as the pilling or bagging of fresh tubers) may take place at the farm level.

Also depending on variety, soil conditions and climatic factors the producer harvests cassava when the roots have accumulated enough starch at 7 months after planting early maturing varieties, late maturing varieties at 12 months after planting. However, studies have shown that several cassava varieties attain optimum fresh weight from 12 – 15 months after planting (IITA, 1990).

2.6.2 Cassava processing enterprise

Cassava is a very versatile commodity with numerous uses and by products. Each component of the plant can be valuable to its cultivator. The leaves may be consumed as a vegetable, or cooked as a soup ingredient or dried and fed to livestock as a protein feed supplement. The stem is used for plant propagation and grafting. The roots are typically processed for human and industrial consumption. In Nigeria, the consumption pattern varies according to ecological zones. According to (Lancaster *et al*., 1982) the leaves can used as animal feeds while the roots are good source of

carbohydrate and are commonly processed to remove naturally occurring toxins and provide storable products that can be consumed or used in the production of secondary products.

The processing stage of cassava involves the transformation of raw cassava tubers into one or more finished domestic and internationally traded goods by the processor. Cassava processing is aimed at reducing the limitation of cassava roots, increase shelf-life and reduce naturally occurring cyanogens (Sanni *et al* 1998). COSCA (1988) also stated that efficient processing of cassava into storable forms offers an opportunity to overcome the perishability of the fresh cassava roots. The essential features of efficient processing include sufficient tissue disruption to allow endogenous linamarase to react with linamarin and then favourable conditions for the breakdown of acetone cyanohydrins (O'Brien *et al.*,1991). It is also revealed that cassava tubers consist of 60 to 70 percent water and have a shelf life of 2 to 3 days (IFAD and FAO, 2000). Thus, once harvested, the tubers have to be processed or consumed immediately to avoid tuber quality deterioration. Imo ADP (2003) concurs to this stating that the need for cassava processing however arises to stabilize the crop for storage purposes and price stability.

Cassava products are classified into roasted granules, stemmed granules, flour/dry pieces and fermented wet pastes (Natural Resources Institute, 1992). Garri, a roasted granule is the dominant product and is widely accepted in both rural and urban areas as convenience food prepared by the simple addition of hot water or milk. It can be consumed without any additives or it can be consumed with a variety of additives such as sugar, groundnut, fish, meat and stew (Blanshard *et al.*, 1994).

An alternative product fufu is a fermented paste that is also widely consumed in eastern and south western Nigeria and other parts of West Africa such as Siera

Leone (Blanshard *et al.*, 1994). Nweke (1994) agreed to this stating that in Nigeria, the production and consumption of fufu is concentrated near the coast and declines in importance further north. Nweke (1994) further revealed that the coastal areas provide the abundant water supply needed for fufu processing as well market infrastructure. Nweke and Bokanga (1994) also noted that in Nigeria, fufu has great commercial potential.

Lafun is another processed cassava product that is similar to fufu. Although the main differences according to Sanni *et al.* (1998) are that lafun is a dried product that has a good shelf-life and fufu is a wet product that has much lower fibre content. Alternatively, chips are made directly from fresh roots whereby the fresh cassava roots are cut into chunks and dried by sun drying. Other products of cassava include starch, abacha, and tapioca.

Presently, the vast majority of cassava roots are processed at the village level by a variety of small-scale methods into many different products that cater for local customs and preferences. In sub-Saharan Africa, cassava roots are processed into various products that are used in diverse ways according to local preferences by a variety of methods (Oyewole, 1990, Oyewole and Sanni, 1995). The process involves combinations of unit of activities such as peeling, slicing, grating, soaking, boiling, stemming, drying, pounding and milling (Sanni *et al.*, 1998). According to Longe (1980), Hahn (1989), Oguntunde and Orishagbemi (1991) the final products characteristics are dependent on the combination of activities used. Abiagom (1971) corroborated also that several products are processed from cassava in Nigeria according to dynamic consumer preferences. According to him cassava through the 1960s was processed and consumed in the following forms: 15% as fresh roots, 5% as garri, 60% as fufu, 10% as starch and 10% as flour. By the early 1980s, the

consumption of fufu had declined to 14% of all cassava eaten, while consumption of garri rose to 65% (FOS, 1981). It is considered that the processing and consumer preference for fufu has reduced due to its inherent undesirable characteristics of poor odour, short shelf life and tedious preparation (Okpokiri *et al.*, 1985).

The rural and urban demand for instance *garri* is higher than that for *fufu*. It is also reported that *garri* is the preferred product for higher income consumers because of the ease with which it is prepared for consumption Sanni *et al.* (1998). These observations suggest that roasted granule (*garri*) processing is more commercialized than the processing of other cassava products. This is due the problems of raw material supply and in producing a product that is competitive with that produced at the household level (Sanni *et al.*, 1998). The situation is different in Latin American where traditional farina de manalioca (cassava flour prepared by toasting grated cassava) have been scaled up and in many cases mechanized (Sanni *et al.*, 1998).

Oyewole and Sanni (1995) buttressed this stating that most processors still prefer to process a large proportion of their cassava roots into *garri* rather than other products. The preference for *garri* could be because its processing is becoming more mechanized. This is different from *fufu* which at present is mainly produced by rural processors at both household and small scale, mainly in eastern and south western Nigeria (Oyewole and Sanni, 1995). This is to say that processing of cassava into *fufu* is largely home based, manually done and labour intensive.

There are also these other major new market opportunities that cassava processors are open to. They are high quality cassava flour as a replacement for wheat flour, cassava starch as raw material for food and non-food industries and cassava chips for either the domestic livestock feed sector or export (Bokanga, 1995). It has been observed that at the moment, processors' involvement in these areas is at low

scale despite their economic potentials. It is against this situation that Plucknett *et al.* (2000) advocated for "A Global Cassava Development Strategy". The strategy according to Plucknett *et al.* (2000) presents a vision of using cassava to spure rural industrial development and raises incomes for producers, processors and traders and contributes to the food security status of its producing households. The strategy is also aimed at using a demand-driven approach to promote and develop cassava-based industries with the assistance of a coalition of groups and individuals interested in developing the cassava industry. In other word, it consists of identifying, in a systematic manner, the opportunities and constraints of cassava at each level of the supply chain

Estimates of industrial cassava use suggest that approximately 16 percent of cassava root production was utilized as an industrial raw material in Nigeria (FAO, 2004a). Thus, small scale cassava processors have been revealed to be predominant and processes over 80% of cassava in Nigeria (Oyebanji and Akwashiki, 2003). Oyebanji and Akwashiki (2003) maintained that, large-scale processing plants that are capable of processing roots quickly are not as prevalent as small scale processors. Thus medium and large processing plants operate but seasonally and at low level. This has been substantiated by Agbo (2002) who observed cassava is the main staple of southern Nigeria; both production, processing and marketing are mainly in the hand of small scale stakeholders that use traditional methods and very little modern techniques; that output will continue to be small and short of its demand. Ekwe *et al.* (2009) also corroborated this pointing out that processing of cassava products is mainly in the hands of small scale processors that process less than 500kg of cassava roots. According to Fresco (1993), the trend has continued despite high market demand for cassava products and significant economic gains.

In Nigeria, the consumption pattern varies according to ecological zones and processing is carried out along this line. According to Oyebanji and Akwashiki (2003) the vast majority of cassava roots are processed at the village level by a variety of small-scale methods into many different products that cater for local customs and preferences. Gari, *Fufu* or *Akpu* (a fermented wet paste from cassava) are widely consumed throughout the country especially in the south eastern zone (Ministry of Health and Nutrition of Nigeria, 2004).

Corroborating the above assertion, Kormawa and Akoroda (2003) estimates Nigeria's industrial cassava raw material utilization to be approximately 16 percent; out of this, 10 percent was used as chips in animal feed, 5 percent was processed into a syrup concentrate for soft drinks and less than one percent was processed into high quality cassava flour used in biscuits and confectionary, dextrin pre-gelled starch for adhesives, starch and hydrolysates for pharmaceuticals, and seasonings.

Cassava processing operations in Nigeria can be described at 5 levels of capacity (Ferris *et al.,* 2002). The common terms used to describe these capacity levels are household (or cottage), micro, small, medium and large. Household level processing typically does not employ any outside labour. The household consumes virtually all of the processed products and sells a small amount to raise income for additional household needs. At present, most Nigerian processors fall within this category.

At the micro processing capacity, the employment of one or two units of labour may take place while processing a variety of cassava products. This enterprise typically uses batch processing. Batch processing may take four hours per day and this would be sufficient for the owner/operator. Nigeria has a few cassava processors in this category of operation. The small and medium processing operations typically

employ three to ten workers and are very sparse at present. Large scale cassava processing is virtually non-existent in Nigeria. Large-scale operations are defined as enterprises employing 10-30 or more labourers. Large-scale operations would also have the capacity for large tonnage processing with wider marketing opportunities.

Processing cassava for industrial purposes implies the transformation of fresh roots in substantial amounts of fairly uniform processed products. In case of flour, chips and ethanol, drying the roots immediately after the harvest is the first step in processing. Cutting the roots in smaller pieces accelerates the drying process. However, cutting in small pieces and laying these out on a clean surface for sun drying takes labor, a vast drying floor, and abundance of sunshine. The three major processing strategies are: (a) processing fresh roots into flour, (b) processing fresh roots into (small and large) chips, and (c) processing fresh roots directly into starch (Ferris *et al.*, 2002).

However, FAO (2002) has observed that the transportation of cassava from the field to the factory/market in Nigeria is a major problem due to poor roads and high costs, with the consequent effect on the variable costs of the operation. According to Ferris Ferris *et al.*, (2002), the costs of transportation in rural Nigeria are extremely high and a key constraint to the development of commercial cassava marketing. Many rural areas of Nigeria still resemble a footpath economy with head portage being the principle means of primary transportation of cassava and products. This is being used in material areas of factory, especially for porting cassava roots from the field to trucks before transporting to markets and processing centers and that is one of the causes of high variable cost of cassava and cassava products

2.6.3 Cassava marketing enterprise

The commercial potential of cassava products in Nigeria has not been fully realized due to a series of technical and socio-economic constraints. Although cassava products are widely consumed in rural and urban areas, *fufu* and gari are the two most popular cassava products in south eastern Nigeria. However, one of the main reasons behind differences in degrees of commercialization between these two products lies in the fact that *garri* has a considerably longer and more stable shelf life than the *fufu* (Henry *et al.*, 1999; Nwajiuba, 1995). Apparently, the contributions made by cassava processing to rural and urban livelihoods in Nigeria and elsewhere would be significantly enhanced if the shelf-life and other key constraints to processing and marketing could be addressed.

Cassava marketing is undertaken in both rural and urban contexts. Primary processing, which entails transforming fresh roots into a wet paste, dried granules and chips, essentially takes place in villages or small towns located within important cassava production areas. Secondary processing on a commercial scale, for instance in the case of *fufu* which consists of cooking the ready-to-eat *fufu* balls from the wet paste for sale in the market has recently gained importance as distances to medium and large consumption centres become shorter. The development according to Nwajiuba (1995) has made cassava marketing an important source of livelihood for many people in rural towns and peri-urban and urban areas, including small canteen owners and food vendors.

Two sorts of factors, both related to the economics of transport, seem to dictate to a large extent the location patterns observed in marketing activities. According to Nwajiuba (1995), the first relates to the fact that fresh cassava roots are extremely perishable once harvested and very bulky to transport, and as a result they

are usually processed close to production areas, often by cassava farmers themselves, who thus have access to expanded income opportunities. In other words, it would not be economical to carry out the bulky tubers to urban centres that are relatively distant from the main sources of production. Similarly, because the wet paste is not as difficult and costly to handle and transport as the ready-to-eat cassava product, it is usually processed further away from major consumption centres. Indeed, whereas market-oriented wet paste processing has been found to take place some 50 or 60 km from the main destination market, ready-to-eat *fufu* processors tend to sell their production in the vicinity or to supply close by sub-urban and urban areas, usually not more than 15 or 20 km distance while *garri* is taken more distances away from the point of production.

There are two predominant market channels for cassava products; a direct one, linking the point of processing to wholesalers and an indirect one, whereby the wet paste is first assembled in a primary market before being channelled to centers of need (Nwajiuba, 1995). Nwajiuba (1995) reiterated that wholesalers may either come to the processing location or wait for the products to come to them. The cycle continues as the products are sold to wide range of retailers, who are often involved in secondary processing and selling also to consumers. Retailers in this context include street vendors, canteens, restaurants and hotels. It is reported that because of the more localized nature of cassava products, marketing chains and the comparatively smaller quantities of the product leaving processing areas, practically no primary assemblage takes place. The products normally moves from the processors to the retailer, and then from the latter to the consumer.

The marketing chains cassava products, whether in its roasted granules (*garri*) or wet paste or ready-to-eat form, present some interesting features that include:

1. First, the products change few hands along the chain. The opposite would be surprising given their short shelf life and the relatively short distances from the point of processing to destination markets.
2. Second, products are mainly sold to wholesalers and are rarely in direct contact with the consumer in the final destination markets.
3. No exports to neighbouring countries or overseas markets are taking place. According to (Henry *et al.*, 1999; Nweke, 1994), marketing of cassava products is in small scale and for local consumption.

This quiet unlike what obtains in most cassava exporting countries like Thailand, that involves direct interaction of small scale producers with export brokers who are responsible for shipping directly to the importing country, through an import broker based in the importing country (FIIRO, 2006). In the EU countries, the Netherlands is a major importer and also acts as a re-exported to other EU countries. The products get to the final end users from the importer broker through a network of wholesaler/distributor/re-exporter or through a retailer who sells especially to those requiring smaller quantities. The major players therefore are the importer and export brokers and probably the wholesalers/distributors/re-exporter that normally control the volume of the trade and even prices.

In Nigeria, Lemchi (1999) further gives a very comprehensive description of the traditional cassava market in Nigeria. According to Lemchi cassava is usually traded in some processed forms like *fufu*, *gari*, lafun, abacha/tapioca and it is aimed at forestalling early deterioration and reduction of its bulky nature. It is estimated that 70% of the cassava produced in Nigeria is processed into gari (Onabalu, 2001). As a result, gari is the most commonly traded cassava product. The market channel for gari consists mainly of three alternative flow channels. First, there is the flow from village

gari processors through the rural wholesale/assemblers and rural retailers to the rural consumers. The second movement is from gari processors to the rural assemblers to the long distant traders who deliver to urban retailers or directly to urban consumers. A third flow is the traffic from gari processors directly to distant traders, thereby bypassing the local assemblers (Onabalu, 2001).

Fresh cassava roots marketing is adjudged to be limited and often carried out by private marketers who operate in both rural and urban markets (FAO, 2007). This may be due to bulkiness of cassava roots and paucity of affordable and in some cases absence of infrastructural support facilities, especially roads and a development policy that pays lip service to up-scaling the agricultural production process through the development of farm-gate processing enterprises. The marketing channel consists mainly of five alternative flow channels (FMST, 2004). First there is the movement from the producer through the rural wholesale/assembler and rural market retailer to the rural consumers. The second channel is the movement from the producer through the processor to either the rural assembler or retailer. The third flow channel is the movement from the processor to the urban market wholesalers, retailers and even to the consumers, while the fourth possible channel is that arising directly from the producer to the rural or urban consumers. The fifth channel is from the producer directly to the rural retailers. Currently, the Federal Government has removed the ban on the exportation of cassava products. This barrier has enhanced cross-border trade in cassava products.

FIIRO (2006) also has revealed similar market access strategy; pointing out that cassava producers are mainly small-scale farmers and most of the processors are also household and micro-level processors, whose individual output is relatively small. FIIRO however, maintained that cassava food products are distributed mainly

through informal marketing channels, whereas products for industrial use are distributed through formal marketing channels involving the producers, the wholesalers, retailers and end- users or two-level marketing channels. In some, a one-level (i.e., producer -> retailer-> end-user) or a zero-level distribution (i.e. Producer -> end-user) channel is used. The later is a common channel for distributing high quality cassava flour and industrial starch.

In parts of the north, raw roots of 'sweet types' of cassava are eaten as snacks (rogo). Otherwise, most harvested roots are processed. The marketing of fresh cassava roots is directly related to a number of factors. Due to their bulkiness, weight and high perishability, fresh cassava roots cannot be transported over a long distance. Usually, tubers are sold, either left in the ground, or harvested and sold in heaps at the farm gate or in rural markets (FMST, 2004). The export of cassava products from Nigeria is presently insignificant due to the fact that export-market channels for the products are yet to be developed (FIIRO, 2006). FIIRO further opine that due to the relatively low level of individual output and processors, access to export market is difficult.

Nwajiuba (1995) also observed that the highly perishable nature of both cassava roots products is recurrent and cross cutting issue in cassava marketing. He further stressed that perishability is such a determining factor behind existing cassava marketing systems and dynamics that its importance cannot be overemphasized. It has also considered that extremely limited possibilities for storage of cassava products reduce the convenience of traders and consumers, thereby restricting market size and reducing the potential for demand growth (FIIRO, 2006). On the supply side, Nwajiuba (1995) reiterated the fact that because marketers are dealing with a highly perishable product, they are always cautious not to expand the size of their operations

beyond a point in which unsold inventories and product spoilage can become a recurring phenomenon, resulting in heavy financial losses.

2.7 Constraints to cassava enterprise

Nigeria as a country is largely endowed with human and natural resources that are necessary for the development of cassava enterprise. The country has a total land area of about 98.3 million hectares out of which 71.2 million hectares are cultivable (Daramola, 2004). It is observed that despite these enormous potentials, cassava enterprise is still dominated by small scale holders as producers, processors and marketers (Awoyemi, 1981). Okuneye (2004), Oluwasola and Adewusi (2008) agreed to these finding and further observed that smallholder agricultural enterprises in Nigeria, like most developing nations, are characterized by both technical, financial, institutional and infrastructural support, which adversely affect the economic wellbeing of farm families and marginalization of the rural space. Manyong *et al.* (1996) earlier found out that cassava enterprise is mainly small scaled in most rural communities and is primarily produced for food especially in form of *garri*, *fufu* with little or no use in agribusiness sector as industrial raw material, notwithstanding the crop can be processed into several other producs like chips, flour, pellets, adhesives, alcohol, starch etc which are raw materials in livestock, feed, alcohol/ethanol, textiles, confectionery, wood, food and soft drink industries. In addition to this, cassava processing for example gari, a “dry pre-gelled particulate product obtained by artisanal or industrial processing of cassava roots” has very little quality measures taken to ensure high quality products. The processing, which, consists of peeling, washing, grating, fermentation, de-watering, fragmentation, sifting, and roasting to drying is reportedly not free from any foreign matter (Ezedinma et al. 2005a). The

reason according to Scott *et al.* (2000) is that processors were lacking with product development, improvement and innovation in terms of fortification, branding, grading and packaging. IITA (2004) has also revealed that major constraints to smallholder agriculture generally are the paucity of affordable and environmentally appropriate technology; absence of infrastructural support facilities, especially roads, and a development policy that pays lip service to up-scaling the agricultural production process through the development of farm-gate processing enterprises.

The cost of hiring labour and the tedium encountered in manual cultivation particularly during land preparation with local implements were also found to discourage investment in cassava enterprise in Africa (IITA, 2004). According to IITA (2004) processing, equipment are generally not easily available, and when available, they are usually inefficient, their parts wear down easily, while the public power supply is very unreliable forcing the processors to depend on the expensive alternative of using power generators in the face of ever escalating cost of fuel for generators. As regards marketing, unattractive prices of products remain a serious problem. According to Yee and Plaludetto (2005), a situation where the cost of transportation due to poor state of access roads and cost of fuel are added to the cost of production make the prices offered for cassava tubers and processed products like *garri* and flour unattractive. Yee and Plaludetto (2005) also revealed that poor business environment in Nigeria relative to other developing countries is a major bottleneck to investment in cassava industry. The variables according to them include cost of credit, level of electricity service, cost of delivery public utilities, cost of labour, rigidity and skill of the labour market, extent to which the logistics system is cumbersome, and burden of regulatory compliance. Yee and Plaudetto (2005) noted that Nigeria, when compared to strategic competitors such as Bangladesh, Kenya and

Indonesia, fares poorly with regards to finance costs. Knipscheer (2003) earlier buttressed that transport costs in rural Nigeria are extremely high accounting for 70% of the difference between farm gate and retail prices for most agricultural commodities. PLucknett *et al*. (2000) pointed out that most African countries have comparative advantage in the production of several crops at the farm gate, but lose this at the wholesale level through high cost and inefficiency of its transport and marketing systems. There is no doubt about this as most African rural areas still resemble a 'footpath' economy with head porterage being one of the principal means of primary transportation of agricultural commodities. Another example of extraordinary costs to marketing is the time it takes to hire a vehicle and roadblocks. It has been reported that traders spends hours to days waiting and negotiating with transporters on the cost per bag depending on road conditions and frequency of security checks (road blocks) that demand money from drivers (Iheke, 2008). Ezedinma *et al*. (2005a) concurs to this noting that marketing produce in Nigeria is complicated by many hidden factors related to supplying produce to markets; for example, the only available transport in most cases is by truck and highway, rail service are virtually non-existent in Nigeria. Thus, good quality roads are few and maintenance irregular, breakdowns, accidents, congestion and road closures all represent a substantial cost for entrepreneurs and the economy. FMANR (2000) observed that unfavourable international price constitutes a major obstacle to the survival of African agricultural entrepreneurs in Africa. FMANR (2000) observed that the low prices are disadvantageous to majority of entrepreneurs especially the small scale sector. IFAD (2004) reported that apart from the low level of prices a more serious constraint is the volatility of the prices. This according to IFAD has to hinder increased investment in the general agricultural enterprise. FMANR (2000) and

NISER (2001) concurred to this assertion and stated that the causes of such unfavourable and volatile price trend include imbalances between supply and demand, slow consumption growth, over-protection by developed countries and political instability.

Similarly, UNS (2000) buttressed that cassava is a tuberous root that contains 60 to 70 percent moisture and has a shelf life of 2 to 3 days and once harvested and requires it to be either consumed immediately or processed into more stable products forms. UNS stated that cassava farmers are often unable to process harvested roots and have to sell their crops at a low price to middlemen who are willing and able to reach them. UNS further noted that supply of cassava influences the market price; as a result, when cassava is scarce and prices are high farmers increase their production, the subsequent oversupply lowers the market price and farmers plant less cassava which results in fluctuating the price cycles of approximately two to three years.

Lack of capital was indicated as a key constraint to cassava enterprise (Daramola, 2004). Both the producers, processors and marketers cannot expand the level of their output due to inadequate working capital (Okuneye, 2004). These constraints have negatively impacted on the employment generation and income earning potentials of cassava enterprise as well as its capacity to serve as the pivot in reducing poverty in the land. Nweke *et al*. (1994) and Ezedinma *et al. (*2005a) listed major constraints to cassava enterprise in Nigeria to include: land tenure, lack of capital fragmentation of cassava farms, pests and diseases, non-mechanized cassava production, processing and preservation, low yield and starch content of common cassava varieties, poor infrastructure, fluctuation in market prices, high raw material cost, high input costs and high energy cost.

2.8 Socio-economics of cassava production

Cassava (Manihot esculenta Crantz) enterprise is one of the most important business initiatives in Nigeria today and across the tropics. As an enterprise set up by an individual or group of individuals, its purpose is to make profits from its operation and provides one essential service or the other. It contributes to Nigeria agricultural sector's ability in providing food for the teeming population and contributes about 33% to the Gross Domestic Product (GDP) of the nation (Bureau of African Affairs, 2010) as well as the sector's provision of employment to about one third of the total labor force and livelihood for the bulk of the rural populace (FMARD, 2006).

The prominence of the enterprise in the lives of people in Nigeria and beyond is shown in the rate at which the crop itself is cultivated and consumed. For instance, FAO (2005) estimated Nigeria's cassava production to be approximately 34 million tones. It is an important staple food and cash crop in several tropical African countries especially Nigeria where it plays a principal role in the food economy. Agwu and Anyaeche (2007), Ezulike *et al*. (2006) corroborated this finding, indicating that it is a staple food crop in South eastern Nigeria and contributes about 15% of the daily dietary energy intake of most Nigerians while supplying about 70% of the total calorie intake of about 60 million people in Nigeria. Nandi, *et al.* (2011) observed that the large population of Nigeria depended on cassava daily as their main dish such as *gari* and *fufu*, the leaves consumed as vegetable and serves as raw material to industries as well as a means of alleviating poverty. The above assertions have buttressed by Awoyinka (2009) who found out that about 90% of cassava produced in Nigeria is however, consumed as food.

Although, the enterprise is reported to be mostly in the hands of small holder famers, it is considered vital for food security and income generation (Nweke, 2004).

The concentration of the enterprise in the hands of numerous small scale holders is mostly noticed in south east and central Nigeria (Nwosu and Asumugha, 2007). Large scale cassava enterprise according to Nwosu and Asumugha is rarely practiced relative to small scale operation. Despite the enterprise level of operation in Nigeria, its expansion has been relatively steady (Adeola, *et al.*, 2008). The activities of the International Institute of tropical Agriculture (IITA) and National Root Crop Research Institute (NRCRI) which included the release of improved varieties contributed to the expansion, diffusion and commercialization of cassava in Nigeria (Nweke, 2004). So far over 27 cassava varieties have been released to farmers by NRCRI in collaboration with IITA located at Umudike and Ibadan respectively (Nweke, 2004).

It has been reported that the traditional market channels for cassava products are more pronounced than the industrial market and which needs to be developed (Nigeria First, 2006). The products currently are mainly fresh cassava tubers, gari, *fufu*, stem cuttings, chips, flour and starch (Ogbonna and Asumugha, 2009).

Numerous other research findings have also revealed positive socio-economic benefits of cassava enterprise. Ogbonna and Asumugha (2009) revealed that the enterprise is a major contributor to employment creation and poverty reduction having gained ground as a cash crop for export. According to Ogbonna and Asumugha (2009) the diversification and expansion of cassava enterprise into new growth markets presents real opportunities in cassava production, processing and marketing system.

It has also been observed that the vital role of the sub-sector in Nigeria economy cannot be over emphasized. Nigeria currently is the largest producer of cassava and over 91 percent of total production is devoted to 75 million people Ugwu (1996 and 1999) in Nigeria for consumption. Nweke *et al.* (1996) also showed that

cassava enterprise form the bulk of the root crop business that provides at least 40 percent of producing households' cash income in major cassava and yam producing areas of Nigeria. Aye, Oboh and Blam (2006) further revealed that cassava enterprise has great values and can play crucial role in contributing to food and nutritional security, income generation, poverty alleviation and socio-economic growth of Nigeria. Apart from contributing to the food base of Nigeria, products such as flour, starch, chips, paper, adhesive, ethanol and pharmaceutical are also provided (Alabi and Oviasogie, 2005). Thus; cassava enterprise offers flexibility to resource poor farmers; serving either as subsistence or as cash crop (Odoemenem and Otanwa, 2011). Nweke and Ezuma (1992) and FAO (2003) also revealed that about 42% of harvested cassava roots in West and East Africa are processed into dried chips and flour. As a cash crop, cassava generates cash income for the largest number of households in companion with other staples (Nweke, 1997). Thus, many Nigerians derive much of their food and employment from cassava production, processing, marketing and cassava based agro-industrial schemes. It is observed that although yam is traditionally the most important food among the indigenous ethnic groups in Nigeria, cassava has gained widespread acceptance as a "Saviour" crop being cropped and consumed by almost all households in Nigeria (BNARDA, 1997).

The research findings of Nigeria first (2005) showed that the sub-sector provides good source of agro-industrial raw materials, such as starch. Although the proportion used by industries was small, it is recently observed to be increasing (Ogbonna and Asumugha, 2009). Currently, bakery industries in Nigeria are mandated to add at least 10 percent cassava flour for a proportion of wheat flour, although most of the bakeries do not openly admit (Nigeria first, 2005). This is

addition to using cassava products as carbohydrate base in livestock feed formulation and in ethanol production (Nigeria first, 2005).

Results of studies have however, shown that some socio-economic factors are important and capable of affecting the productivity and benefits of population either positively or negatively (Apata, 2007). The findings of Dagwa (2006), Adebayo *et al.* (2007), Irokwe *et al.* (2009) for maize farmers in Adamawa state, for millet farmers in Bauchi state, and for cassava producing women in Ebonyi state Nigeria respectively showed that household size, age, experience and farm size have positive and significant relationship with the socio-economic benefits of stakeholders. In addition, educational status was further revealed to have positive relationship with the level of benefits and socio-economic status of women stakeholders in cassava production in Ebonyi state, Nigeria (Irokwe *et al.*, 2009). The finding was consistent with Onyenweaku and Nwaru (2005) for food crop production stakeholders in Imo state of Nigeria. Certainly education and training are crucial factors in unlocking the natural talents and inherent enterprising qualities of people, and enhances their abilities to understand and evaluate new production techniques leading to increased productivity and income (Nwaru, 2007). These findings from a priori experience is not far from being genuine as any increase in any of the variables would incidentally increase the productivity and socio-economic benefits and status of the entrepreneurs in the enterprise.

According to Nwaru (2004), Irokwe, Ekwe, Okoye and Chukwu (2009) whereas age of an entrepreneur is important in determining productivity and benefits in an enterprise, large household size was found to determine availability of cheap labour for increased productivity and gain. Okoye *et al*. (2009) agreed to this finding stating that large household size might create a positive effect on productivity if

household labour is devoted mostly to farm enterprise. Years experience in cassava enterprise according to Irokwe *et al.* (2009) is an indication of practical skill and knowledge and a positive socio-economic determinants for cassava production among women farmers in Ebonyi state, Nigeria. Okoye *et al*. (2009) corroborated this finding stressing that the more experienced a farmer is the more efficient his decision making process and the more he is willing to take risks associated with farm enterprise. This is consistent with Onyenweaku and Okoye (2007) who observed that increased extension contacts would lead to more knowledge on improved cocoyam technologies which have a strong influence in increased productivity.

In conclusion, it is obvious from the above review that Nigeria is the largest producer of cassava in the world. It is revealed also in the literature that the crop has contributed in no small measure to the development of agrarian economy and agri-business stage of Nigeria. The crop is consequently identified as a very powerful poverty fighter, by reducing cost of feeding through lower prices thereby making food available to millions of consumers. The profitability therefore has opened a widow of opportunities and high level involvement to entrepreneurs (producers, marketers and processors) in the enterprise at different scale of operation. It is further established in the review that the sub-sector has high level of benefits notwithstanding its myriads of constraints. Although, it is sad that irrespective of the sub-sector's level of benefits, scanty and/or absence of relevant and robust data on the contributions of cassava enterprise to socio-economic status of those involved in it has continued to characterize the sector. Focus on analysis of cassava production usually does not bring out the synergy in the activities of producers, processors and marketers. This study intends to bring out the synergy to achieve improvement along the value chain. This will help the process of transformation in cassava enterprise.

CHAPTER THREE

3.0 THEORETICAL AND CONCEPTUAL FRAMEWORK OF THE STUDY

3.1 Theoretical framework

A theory is a set of interrelated definitions and relationships that organize our concepts of and understanding of the empirical world in a systematic way (Ogunbameru, 2008). It is simply defined, as a set of ideas that provides an explanation for something (Harallambus and Holborn, 2000). Theory is used to explain phenomenon, identify causal mechanisms and processes which, although cannot be observed directly, can be seen in their effects. Kerlinger (2000) defined theory to mean a set of systematic view of phenomenon by specifying relations among variables, with the purpose of explaining and predicting the phenomenon. Thus, the following theories are considered relevant to this study:

1. The farming styles (FS) approach
2. The Actor-Network Theory (ANT)
3. Action theory
4. Value chain analysis theory

3.1.1 The Farming Styles (FS) Approach

The farming style approach was developed by Ploeg J.D.V.D and A. Long at the Agricultural University, Wageningen. The theory is aimed at helping us understand farm enterprise as a matter of social interaction**.** Farming styles theory explains the heterogeneity among the people that are involved in the enterprise. Ploeg and Long

(1994) defined farm enterprise as a social and goal-oriented co-ordination of whole range of tasks, which together constitute the totality of the farm labour process.

In this view a farm enterprise may be understood as a system of activities by various people linked to the goals of the actor(s) involved. The theory sees the practice of farm enterprise by individuals as being developed within the framework of local social constructed farming styles, which Ploeg (1993) defined as a cultural repertoire, a composite of normative and strategic ideas about how farm enterprise is run. In the context of farming styles (FS) approach, farm enterprise is understood as a specific set of inter-linkages between a unit of farming activity on the one hand and the surrounding markets, marked agencies, government policy, and technological development on the other. These interrelations are structured in such a way that the specific practices can be reproduced over time." According to Ploeg and Long (1994), the theory explains the differences in dynamics and processes between those involved in farm enterprise and their values which play central role in understanding the goal orientation of farm enterprises.

3.1.2 The Actor-Network Theory (ANT)

Actor-Network theory was developed by (Alroe and Kristensen, 2002). It gives a simplistic illustration of a farm as a network of internal and external relations. It is a theoretical concept that understands farm enterprise as a self-organizing system characterized by a heterogeneous mixture of many elements and stakeholders that are translated and enrolled into the objective of enterprise.

The theory sees the heterogeneous network of enrolled entities as not being limited only to the physical site of the farm enterprise but are as well enrolled and mobilized as actors into the farming processes. The kind of entities and actors that are enrolled into the network and how they are enrolled are characteristics of the

enterprise. However, the perspective and understanding of farm enterprises from an ANT approach and the ensuing relational entities is that the entities get their forms and performances through the relations in which they are located ((Law, 1999). Similarly, the entities enrolled in the network of the farm enterprise can be actor-networks themselves, e.g. the producers, processors, consultants and wholesalers may organize their own heterogeneous complexity with each striving to translate farm enterprises into their own network strategy by selling their products.

3.1.3 Action Theory

Action theory was developed by German scientists in the field of applied psychology (Freese and Zapf 1994; Frese and Sabini, 1985). The theory lays emphasis on a task-oriented nature of human behaviours. The main purpose is to describe how a person completes a task. There are three underlining principles in the application of action theory that includes: motive-activity, goal-action and instrumental conditions-operations. In this approach, accomplishment of a top-level activity depends on accomplishment of lower level actions followed by operations. Motives are inspirations causing a set of goals, and actions for these goals consist of various operations and actors.

Action theory believes that an individual's attitude or even perception on an issue affects to a large extent his/her involvement in it. It means therefore that one's point of view is favourably a factor capable of inclining the person to an activity. The theory also submits that a prevailing opportunity is a sin qua non for a person(s) to get involved in the action (Meizies, 1982). This also implies that involvement of different entrepreneurs in cassava enterprise is predicated on their perception and conviction of possible benefits or rewards.

3.1.4 Value Chain Analysis Theory

The value chain approach was developed by Micheal Poter in the 1980s and has long been identified as a powerful tool for analysing strategic planning of any enterprise (Panthania-Jain, 2001). The theory is used to develop an organization's sustainable competitive advantage in the business arena. The theory sees an enterprise as consisting of activities linked together to develop the value of business and together these activities form the organization's value chain. This network of activities includes production of goods, distribution and marketing of organization's products and activities (Lynch, 2003). According to Micheal (1990) the theory is a strong tool in the hands of entrepreneurs to identify key activities within an enterprise as well as potential for sustainable competitive advantage. The implication of the theory is that entrepreneurs in cassava enterprise are human beings and have basic socio-economic needs. Thus, their involvement in cassava enterprise is often predicated upon the contributions cassava enterprise on their socio-economic needs.

It is therefore certain that; from the review of the aforementioned theories, none of them can singly and fully buttress the contributions of cassava enterprise to the socio-economic status of entrepreneurs in the study area. Thus, all the theories lead to the framework on the contributions of cassava enterprise to the socio-economic status of entrepreneurs in South- eastern Nigeria.

3.2 Conceptual framework and how it works

A conceptual framework shows the articulate nature of the relationship between the independent and dependent variables (Ogolo, 1996) and indicates how intervening variables may affect the relationship. It is a supporting structure around which a research ideas and efforts can be built. According to Aworh, *et al.* (2006) a

conceptual framework is an abstract and stylized ordering of research ideas, which is meant to guide research design.

Consequently, the conceptual framework of this study is based on the premise that cassava enterprise is affected directly or indirectly by the socio-economic characteristics of the entrepreneurs, enterprise characteristics, access to intervention, type of enterprise, scale of operation and level of involvement, benefits derived, and constraints, as well as government policies. These factors are classified into dependent, intervening and independent variables as indicated in Fig.1.

The framework indicates that the dependent variable is influenced by independent variables as well as some intervening variables. The independent variables of the study include entrepreneurs' socio-economic characteristics and enterprise characteristics, access to intervention, level of involvement, scale of operation, type of enterprise and benefits derived, as well as constraints to cassava enterprise. The individuals relate with respective enterprises at different levels of involvement and in the process encounter some constraints. The individuals also derive benefits in the face of the constraints. The benefits are expected to directly affect the socio-economic status (SES) that the individual achieves. These variables thus have direct effects on the socio-economic status of the entrepreneurs in the cassava enterprise.

The intervening variables were the variables that come between the independent and the dependent variables. According to Kerlinger (2000) it accounts for the internal and directly unobservable psychological processes that in turn account for behaviour effect. Although, they were variables not focused upon, their influences sometimes could not easily be delineated or measured, affecting the way the independent variables influenced the dependent variables.

In this light, government policy, diseases and pests outbreaks, weather condition combined to or separately influenced benefits derived and socio-economic status of those involved in cassava enterprise. Similarly, government policies and cost of input likely affected levels and scale of operation in cassava enterprise. The effect may have reduced or improved entrepreneurs' involvement in cassava enterprise and consequently their socio-economic status.

On the other hand, the dependent variable of the study (socio-economic status of the entrepreneurs) was categorized into low, moderate and high. The combinations of level of involvement and type of enterprise, entrepreneurs' socio-economic characteristics, and enterprise characteristics, scale of operation, benefits derived, access to input and constraints were possible determinants of entrepreneurs' socio-economic status. Others included diseases and pests outbreaks, government policies and cost of input.

The individual entrepreneurs in the cassava enterprise have specific characteristics with which they relate with their respective enterprises. The individuals are entrepreneurs who have different focus on cassava such as production, processing and marketing. This affects their scale of production which may be small, medium and large. Characteristics of the enterprises such as farm size, finance, labour type etc. also have bearing on their scale of production. These interact with the enterprise type to lead to level of involvement which may be high or low. The enterprises encounter constraints which limit their level of involvement. The extents to which they can overcome the constraints determine the benefits they derive from the enterprises. Access to inputs among the entrepreneurs also affects the benefits they derive. Variables such as natural disasters, weather, etc. intervene in the flow of the interaction to enhance or impede the change that takes place in the socio-

economic status of the entrepreneurs. All of these determine the eventual socio-economic status of the respondents whether it is high, moderate or low.

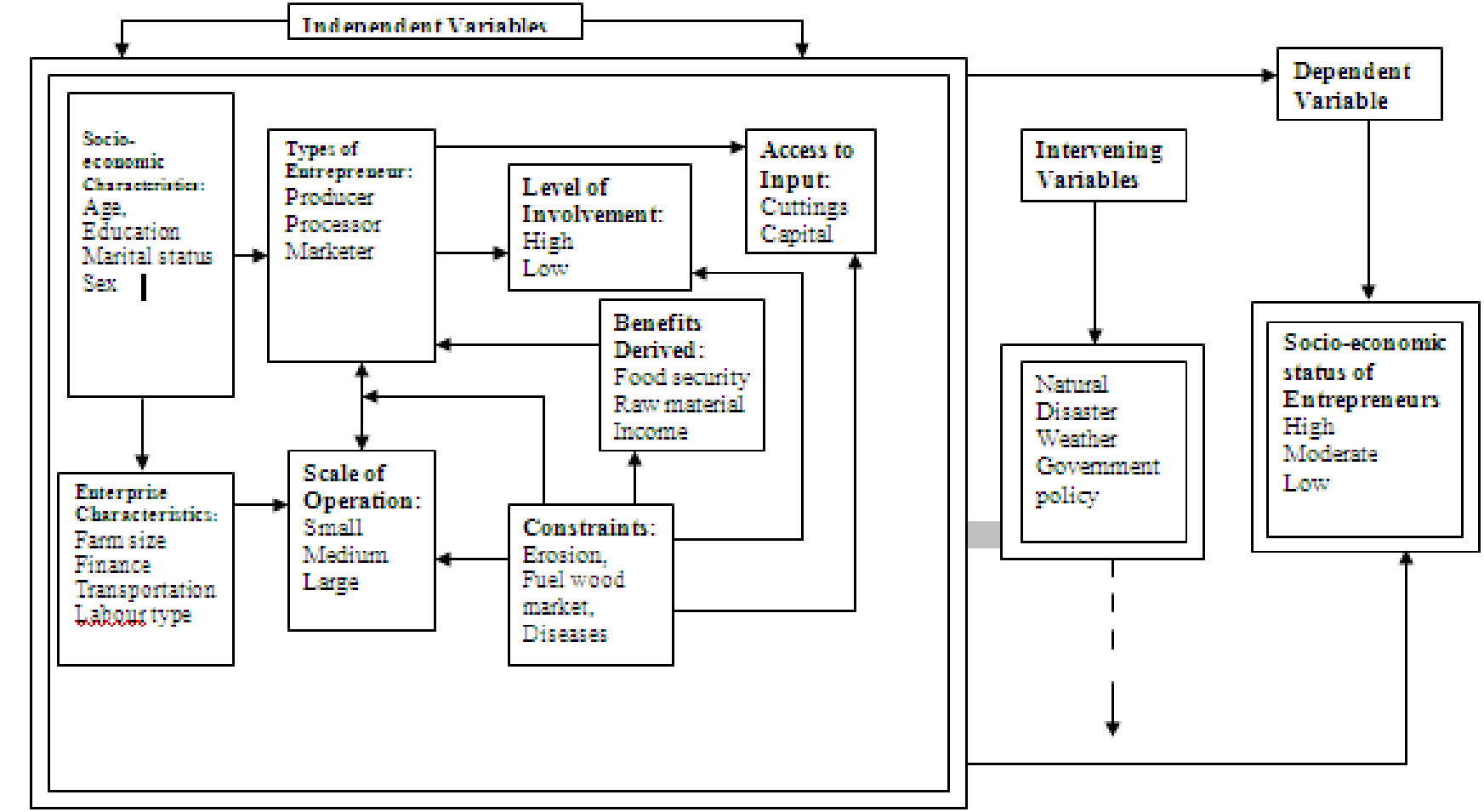

Fig. 1: Framework for Contributions of Cassava Enterprise to Socio-Economic Status of Entrepreneurs

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Study area

The study area is South eastern zone of Nigeria. South eastern Nigeria consists of present Abia, Anambra, Ebonyi, Enugu and Imo States. The zone is surrounded on all sides by other tribes (the Bini, Ijaw, Ogoni, Igala, Tiv, Yakurr and Ibibio). Currently, the major ethnic group is the Igbo who are mainly Christians. There are other ethnic groups that are settlers and they are either Moslems or Christians.

However, the area is divided by the Niger River into two unequal sections – the eastern area (which is the largest) and the western area (the smallest). The zone lies within the highest vegetation belt and is characterized by two climate seasons; the rainy and dry seasons. The rainy season begins in April and lasts till October with the annual rainfall varying from 1,500mm to 2,200mm (60 to 80 inches).

An average annual temperature above 20 °C (68.0 °F) creates an annual relative humidity of 75% and reaches 90% in the rainy season. During the dry season, the zone experiences two months of harmattan from late December to late February. The hottest months are between January and March. This explains reasons why the zone is primarily agricultural, producing mainly cassava, yam, cocoyam, leafy vegetables, maize, melon, okro, palm fruits, banana etc. Most of these agricultural activities are concentrated in the

rural areas, necessitating the transportation of the surplus produce to the urban centers and beyond. The zone is well severed by a network of rough but accessible rural roads that permit spatial rural- urban interaction. Comparably, South East is among the leading cassava producing zones in Nigeria (IITA, 2004).

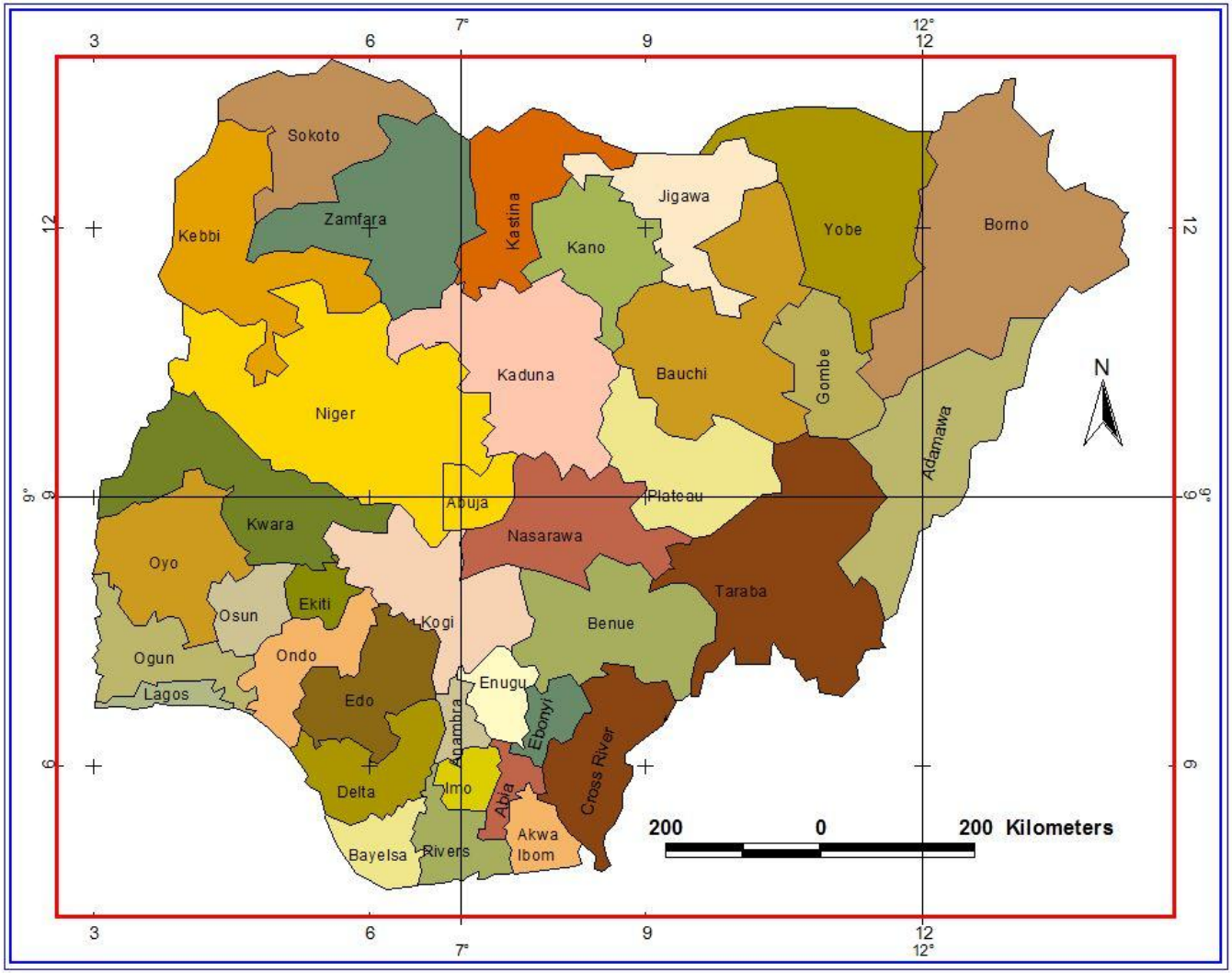

Fig. 2: Map of Nigeria showing States in Nigeria

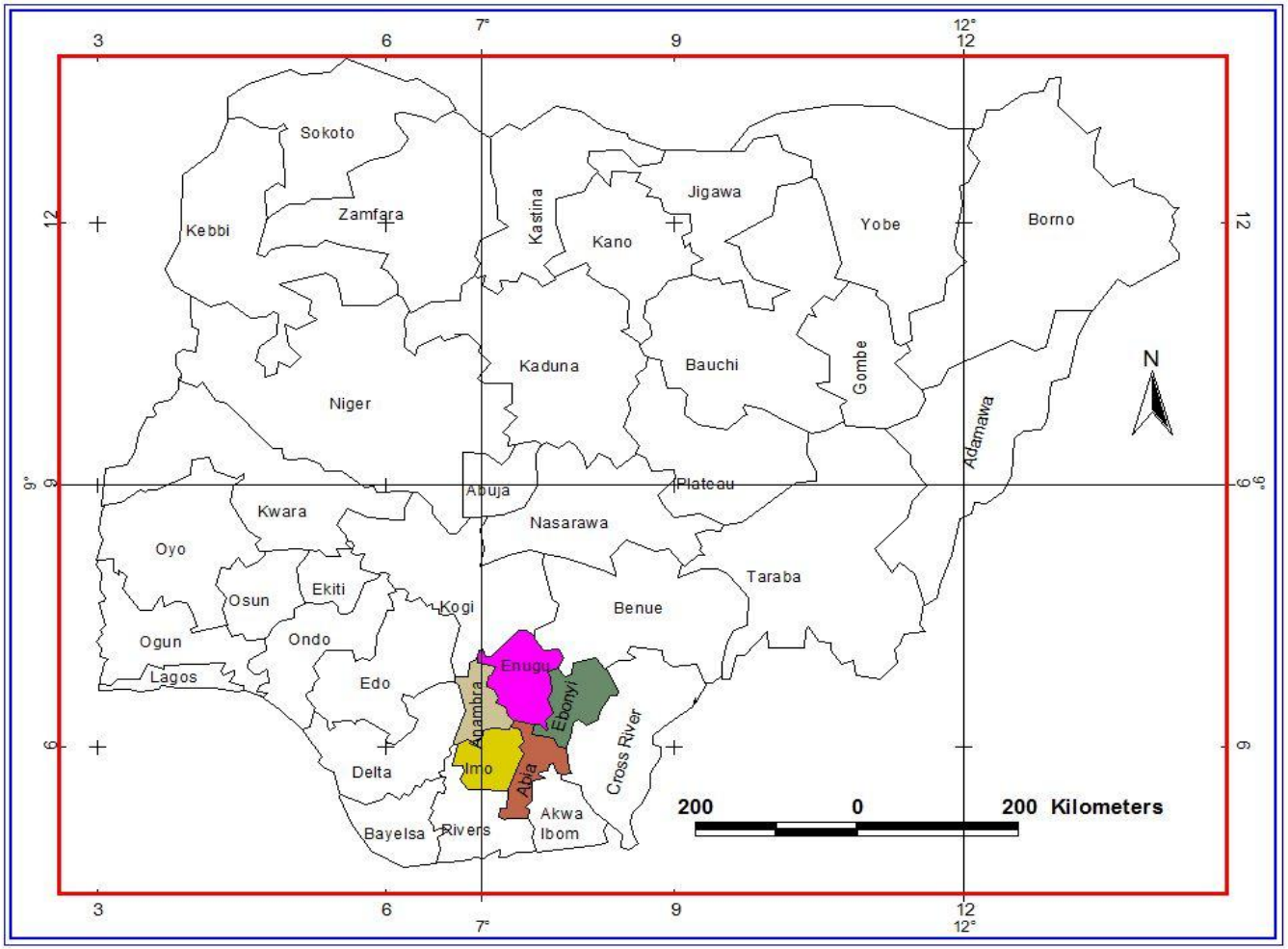

Fig. 3: Map of Nigeria showing South eastern Nigeria

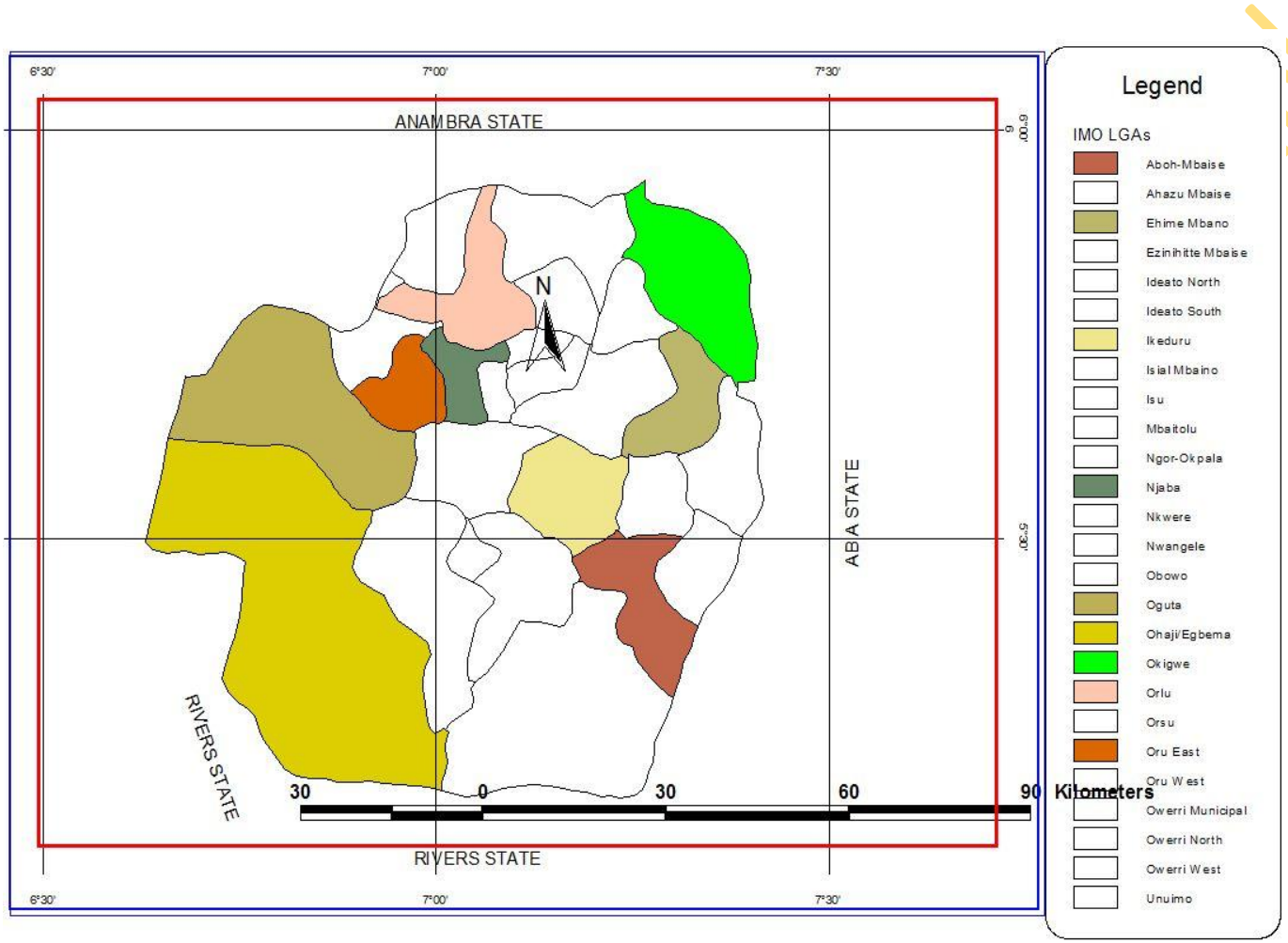

Fig. 4: Map of Imo State showing selected Local Government Areas (shaded) for the study

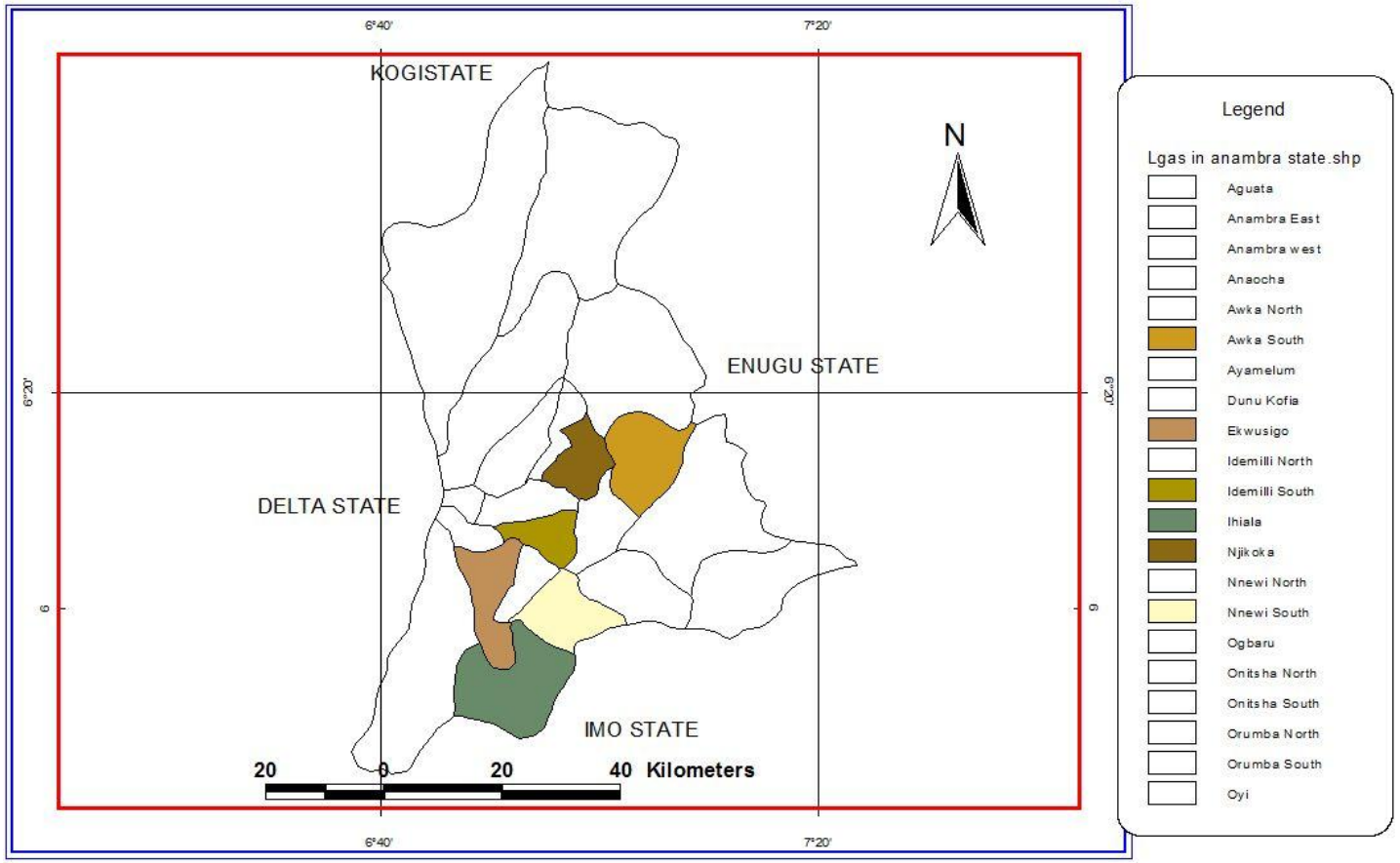

Fig. 5: Map of Anambra State showing selected Local Government Areas (shaded) for the study

4.2 Study population

The population of the study is entrepreneurs in cassava enterprise in South eastern Nigeria. The entrepreneurs include farmers (producers), processors and marketers who have the mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management within a new or an existing cassava enterprise.

4.3 Sampling procedure and sample size

Multi-stage sampling procedure was used in selecting respondents from the study area. South eastern Nigeria has five States which include; Abia, Anambra, Ebonyi, Enugu and Imo. Two states namely; Imo and Anambra were purposively selected because of their prominence in cassava enterprise (PCU 2003, IITA, 2004).

Imo State is made up of twenty-seven Local Government Areas. At the first stage, 33% of the 27 Local Government Areas was selected using simple random sampling technique to give nine Local Government Areas: Oguta, Ohaji/Egbema, Oru-East, Orlu, Ikeduru, Njaba, Mbano, Aboh-Mbaise and Okigwe. The second stage involved using simple random sampling technique to select three communities from each of the nine Local Government Areas to give 27 communities. At the third stage, a list containing an average of 15 members of Cassava Growers' Association was obtained in each of the 27 selected communities. Using systematic sampling technique, every 5^{th} member, that is, 3 members (20%) from the list were selected to get a total of 81 producers. Also, systematic sampling technique was used to select 2 (20%)

processors from the list of Cassava Processors' Association containing an average of 9 members from each of the 27 selected communities to give 54 processors. Although, a total of 50 interview schedules were usable.

Snowball technique was used to identify a marketer from a major market involved in cassava enterprise who in turn helped in identifying other marketers. This process continued until a list of 265 marketers was obtained, averaging 10 marketers from each of the 27 communities. Twenty percent (i.e. 2 marketers each from the 27 communities) of the list was selected using simple random sampling technique to give 54 marketers. However, 51 of the interview schedules were usable and this gave 182 respondents representing 81 producers, 50 processors, and 51 marketers.

A similar sampling procedure as in Imo state was repeated in Anambra state that has 21 Local Government Areas. Multi-stage random sampling technique was used in selecting the respondents. At the first stage, 30% of the 21 LGAs was selected using simple random sampling technique to give six local government areas: Idemili south, Ihiala, Ekwusigo, Awka South, Nnewi South and Njikoka.

The second stage involved using simple random sampling technique to select three communities from each of the 6 L.G.As to give 18 communities. The third stage involved obtaining a list of Cassava Growers' Association containing an average of 15 members from each of the 18 selected communities. Using systematic sampling technique, 3(20%) was selected to give a total of 54 producers. Also, 2(20%) processors were selected from the list of Cassava Processors' Association containing an average of 10 members

in each of 18 communities using systematic sampling technique to give a total of 36 cassava processors.

Snowball technique was used to identify a marketer from a major market involved in cassava enterprise who in turn helped in identifying other marketers. This process continued until a list of 182 marketers was obtained averaging 10 marketers in each of the 18 communities. Twenty percent (i.e. 2 marketers each from the 18 communities) of the list was selected using simple random sampling technique to give 36. This gave 126 respondents representing 54 producers, 36 processors, and 36 marketers as shown in Table 4.1. This gave a total sample size of 308 that was used in the study.

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Table 1: Sampling procedure

State	No of L.G.A	Sampled L.G.A	Sampled entrepreneurs			Total no of entrepreneurs
			Producers (20%)	Marketers (20%)	Processors (20%)	
Imo	27	9	81	54 (51)	54 (50)	182
Anambra	21	6	54	36	36	126
Total	48	15	135	87	86	308

4.4 Method of data collection

The data for the study was collected from primary source through the use of interview schedules.

4.5 Reliability and validity of instrument

Reliability

In order to ensure that the data obtained with the instrument are reliable with their ability to give consistent result, an analysis of internal consistency of the instrument was carried out. A total number of 43 copies of the questionnaire were administered to cassava entrepreneurs in Abia state that was not included in the study. The split-half method of reliability was used. A reliability co-efficient (r-value) of 0.7 was obtained which was considered good enough for the instrument as it indicates a 70 percent reliability.

Validity

In order to ensure the validity (appropriateness) of the instrument for data collection (i.e. ensuring that the instrument measured what it was intended to measure), it was subjected to face and content validity with the assistance of experts (lecturers) in the field of agricultural extension and rural development. The process resulted into identifying defective and irrelevant items that were corrected for inclusion in the instrument while some were dropped for their inappropriateness.

4.5.1 Measurement of variables

Independent variables

Socio-economic characteristics of respondents

1. Age: Respondents were asked to state their actual age(s) in years

2. Sex: Respondents were asked to indicate their sex (a) Male (b) Female

3. Marital status: Respondents were required to state their marital status (a) Single (b) married (c) Widow

4. Education: Respondents were asked to indicate their levels of education (a) Formal education (b) Non-formal education

5. Household size: Respondents were asked to state the number of people living with them

7. Household type: Respondents were asked to state their household type (a) Male headed household (b) Female headed household

8. Years of experience: Respondents were asked to state the number of years they have been involved in cassava enterprise

9. Income per annum: Respondents were asked to indicate the total income realized per annum from cassava enterprise.

10. Marketing outlets: Respondents were asked to indicate their marketing outlets (a) Farm gate (b) Middlemen

Enterprise characteristics

11. Farm size (producers): Respondents were asked to indicate their farm size

12. Sources of land/shop: Respondents were asked to state their sources of land/shop (a) Rented/leased (b) Family land (c) Communal ownership (d) Outright purchase (e) Government

13. Other crops planted: Respondents were asked to state other crops they cultivate together with cassava. The crops will be grouped into annual and perennial crops. (a) Maize (b) Yam (c) Vegetables (d) Others

14. Sources of labour: Respondents were asked to indicate their sources labour which will grouped into hired and family sources (a) family members (b) Paid labour (c) friends (d) self

15. Sources of fund: Respondents were asked to indicate their sources of capital Informal sources: (a) personal savings (d) gifts/donations Formal sources: (c) Credit from bank (d) Inheritance

16. Cassava variety planted: Respondents were asked to indicate type of cassava variety planted (a) Local variety (b) Both variety

17. Means of transportation: Respondents were asked to indicate their means of transportation. Motorized: (a) Trailer (c) Motorcycle (e) Pick up van (f) Boat Non-motorized: (d) Head porteage (b) Truck (g) Bicycle

18. level of Involvement in cassava enterprise: the respondents were asked to indicate their level of involvement in cassava enterprise on a three-point scale using scores of Not at all = 0, Occasionally = 1 Always = 2 (interval). The mean score and standard deviation (67.28 ± 8.69; 63.74 ± 7.42; 63.74 ± 9.47; and 66.26 ± 8.70) were generated for producers, marketers, processors and overall respectively and used to categorize the respondents into low (< mean ± 1SD), moderate (within mean ± 1SD) and high (> mean ± 1SD) levels of involvement for all enterprise categories.

19. **Scale of operation:** The producers were asked to indicate the actual number of bags (308.96 ± 358.40) and quantity of stem cuttings (259.96 ± 289.58) of cassava produced. Processors were also asked to indicate the quantity of fresh tubers processed into *garri* (81.88 ± 120.57) and *fufu* (46.37 ± 56.13). Quantity of fresh

tubers marketed (745.21 ± 96.87), cassava cuttings in bundles (192.26 ± 191.61), gari marketed in bags (89.71 ± 124.95), tapioca marketed in bags (11.78 ± 7.60) and *fufu* marketed in bag (88.07 ± 110.26).The mean and standard deviation of the sum of scores for each entrepreneur's categories were obtained. The respondents whose scores were below mean bags - 1SD were categorised as small scale producers, processors and marketers respectively for each enterprise category. Also, respondents whose scores were within the mean score ± 1SD were categorised as medium scale entrepreneurs, while those respondents, whose scores were mean + 1SD and above were categorised as large scale entrepreneurs for such enterprises under consideration.

20. Access to intervention programme: Respondents were asked to indicate which of these intervention programmes are available using yes =1 and No = 0

Scoring: Highest score = 13 and Lowest score = 0

High score means greater access while low score means little access

21. Frequency of access to intervention inputs: Respondents were asked to indicate the frequency of access to intervention inputs as always (2), occasionally (1) and not at all (0). Respondents' scores for level of access to intervention inputs were obtained, from which the mean scores were generated for cassava producers (mean = 8.15), marketers (8.94 ± 2.16) and processors (mean = 9.92) and overall (mean = 8.31) respectively. The maximum and minimum score obtained for producers, marketers and processors were 0-13, 0-12 and 5-11 respectively. Based on below and above mean criterion, respondents were categorised into having low (< mean access scores) and high (≥ mean access scores).

22. Benefits derived from cassava enterprise: Respondents were asked to respond to 26 items on benefits derived from cassava enterprise using three point scale Low = 1, Moderate = 2, High = 3 (interval). The mean and standard deviation of the

respondents scores for level of benefits were obtained as 67.28 ± 8.69, 67.15 ± 7.42, 63.74 ± 9.47 and 66.26 ± 8.70 for producers, marketers, processors and overall respectively. The range of scores for producers, marketers and processors were 0-78, 21-78 and 0-78 respectively. Respondents were consequently categorised into having low (< mean ± 1SD), moderate (within mean ± 1SD) and high (> mean ± 1SD) level of benefits.

23. Constraints to cassava enterprise: This was measured by a list of 28, 28 and 27 statements for producers, marketers and processors respectively using a three point scale of Not a constraint = 1, Mild = 2 and Serious constraints = 3 (interval) The highest score obtained was 84 while the lowest score was 64 for the entrepreneurs. The mean scores and standard deviation (79.99 ± 3.07; 78.90 ± 7.28; 78.02. ± 4.89; and 77.81 ± 6.68) were obtained for producers, marketers, processors and overall respectively and used to categorize the respondents into low (< mean ± 1SD), moderate (within mean ± 1SD) and high (> mean ± 1SD) levels of severity of constraints for all enterprise categories.

Dependent variable

24. Socio-economic status of the entrepreneurs: The dependent variable is Socio-Economic Status (SES) of entrepreneurs in cassava enterprise. In measuring the SES of entrepreneurs, standard scales of Ovwigho, (2000) was revalidated. In doing this, the SES was measured as number of items possessed 0, 1, 2-4, and above 4 (for continuous items) while the 'yes' and 'no' responses were for categorical items. The respondents were asked to indicate whether they possessed the items by placing a check mark (/) on the number of items possessed and tick yes or no for items that are categorical. To isolate the valid items, each selected item (non-standardised items) was correlated with the standardized scale of Ovwigho, (2000) using PPMC. Items

whose standard deviation values were higher than the mean values were removed. This gave a total number of 43 items that discriminated among the respondents and were used for the study.

The mean and standard deviation of the respondents' scores for SES were obtained as 160.99 ± 7.18, 162.75 ± 3.95, 159 ± 8.80 and 161.12 ± 7.04 for producers, marketers, processors and overall respectively. Respondents were consequently categorised into having low (< mean ± 1SD), moderate (within mean ± 1SD) and high (> mean ± 1SD) SES for all enterprise categories.

4.6 Data analysis

Data collected were analysed using both descriptive and inferential statistics. The data were analysed at 0.05 level of significant.

Table 1.2: Testing of hypotheses

Hypotheses	Statistical tool
1	Chi-square
2	ANOVA
3	PPMC
4	ANOVA
5	PPMC
6	PPMC
7	Multiple regression

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1 Introduction

This chapter presents and discusses the results of the study. It is divided into nine sections which include: descriptive report on the socio-economic characteristics of respondents, enterprise characteristics, involvement in cassava enterprise, and scale of operation, access to intervention programmes, benefits derived and constraints to entrepreneurs' involvement and socio-economic status as well as results of tested hypotheses.

5.2 Section 1: Discussion of entrepreneurs' socio-economic characteristics

5.2.1 Age

The result of analysis as presented in Table 3 reveals that the modal age range was between 56 to 65 years (54.2%) with a mean age of 56.0 years. Across entrepreneurs' categories, results reveal that most producers (54.8 %) and marketers (71.3 %) were within the same age range of 56-65 years, most processors (71.3 %) were in the age range of 45-55 years. This implies that in the study area, cassava enterprise is not carried out by active and energetic people. It further indicates that cassava enterprise may not be sustainable if allowed to remain in the hands of aged entrepreneurs that are no more in their active productive economic age. The need to encourage youth to be involved may therefore not be over-stressed. It therefore calls for government's quick intervention to making the enterprise attractive and more profitable (making loans and modern productive and processing machines available)

for youths' involvement and participation. This is expected given the rate at which young and energetic working population is migrating out of the study area to the cities in search of white collar jobs. The result is in line with Eze (1993) who reported that the mean age of rural farm households across the various states of south eastern Nigeria was 53 years; indicating also that young ones were no more showing much interest in agriculture (Ladele and Edgal, 2005).

5.2.2 Sex

The distribution of the entrepreneurs by sex shows that majority (77.9%) were females. The result also reveals that across entrepreneurs' categories, most producers (78.8%), marketers (71.3%) and processors (89.5%) were mainly females. This indicates that though cassava enterprise is not gender exclusive but it is mostly carried out by the female entrepreneurs as producers, marketers and processors. The result is in line with a priori expectations as women in the study area owned more cassava enterprises to the point that cassava is termed a woman's crop. This implies that cassava enterprise may not easily grow beyond its subsistent level in the study area. This is because women (who are mostly involved in the enterprise do not have absolute control over land, not to talk of expanding her scale of operation or using same for collateral. Such a scenario limits entrepreneurs' productive potential, benefits and change in the socio-economic status. The result concurs with the finding of Asumugha and Nwosu (2006); Ajieh and Uzokwe (2007) that women play a leading role in cassava enterprises, contributing about 67% of the total labour in the south-east, 58% in south-west and 88% in North-central zones, with involvement in virtually all activities namely hoeing, planting, weeding, harvesting, transporting, storing, processing, marketing and domestic chores.

5.2.3 Marital status

Findings on the marital status as shown in Table 3 reveals that majority of the entrepreneurs (95.8%) were married. Across the entrepreneurs' categories, most producers (91.9%), marketers (100%) and processors (97.7%) were married. The result is expected and supports the idea that married people have more responsibilities hence their increased need for coping strategies to financial and food security obligations in their households. The result confirms the finding of Imo (2002) and Ekwe et *al*. (2009) that most food crop farmers, cassava processing and marketing households in the south-east were married.

5.2.4 Household size

The household size distribution of the respondents as shown in Table 3 indicates that most entrepreneurs (97.7%) had household size of above 8. The result also reveals that across entrepreneurs' categories, most producers (97.8%), marketers ((98.9%) and processors (96.5%) had same household size of above 8. The result was expected in view of the extended family system that operates in the study area whereby parents, children and other relations dwelt or live together as a household. The result also implies that most entrepreneurs are likely to source some cheap labour within the households to assist in enterprise activities. The large household size also implies likelihood of household food security reduction, decrease in benefits, income and socio-economic status. However, sourcing cheap labour from the household establishes financial incapability of the entrepreneurs to carry out some of the enterprise activities themselves due to old age as well as employment of paid labour that is often expensive. The result is in line with that of Ironkwe, *et al*. (2009) who reported that most farm families in Nigeria have large household size of between 6 to 10 persons.

5.2.5 Educational attainment

Results available in Table 3 reveal that a large proportion (67.2%) of the entrepreneurs had formal education up to secondary school level. Result across entrepreneurs' categories also shows that high percentages of producers (71.9%), marketers (65.5%) and processors (61.6%) completed secondary school education. The result is contrary to a priori expectation due to the rate people in the area once abandoned education for fast income generating ventures. The result therefore implies that most cassava entrepreneurs in the study area have formal knowledge of cassava enterprise and can use it to understand and evaluate information on new techniques to raise productivity. The result is line with the finding of Uchechi and Ebelenna (2009) that most people in cassava enterprise in Abia state, Nigeria could read and write.

5.2.7 Household type/or Household head

Table 3 contains household type/or household head of the various entrepreneur categories. It reveals that majority (91.6%) of entrepreneurs' households were male headed. Results across entrepreneur categories also show that households of most producers (89.6%), marketers (98.9%) and processors (95.4%) were male headed. This was expected and typical of south eastern traditional society where men are mainly heads of their households. This implies that the entrepreneurs (who are mainly women) will find it difficult in taking decisions that can improve their productivity or operational scale, benefits and socio-economic status as women in the study area do not own or have absolute control over landed property. The result is consistent with Deji *et al*. (2005) who revealed that the age long tradition that positions men as heads of their households in Nigeria still prevails despite social and economic trend that suggest a rise in the proportion of households headed or principally maintained by women (Folbre, 1991).

5.2.8 Years of experience

The finding as shown in Table 3 indicates that year of experience of most entrepreneurs (54.0%) were between 25-50 years. The result also reveals that across entrepreneurs' categories, most producers (80.7%), marketers (75.9 %) and processors (84.9%) were within the same 25-50 years of experience in cassava enterprise. The result was expected in view of the fact that involvement and acquisition of skills and knowledge in cassava enterprise in the study area normally begins at early childhood stage. This implies that cassava farming is not just an occupation but a way of life of the people in the study area. The finding is in line with that of Ironkwe *et al*. (2009) that most people in south eastern Nigeria are highly experienced in farm enterprise.

Table 3: Distribution of entrepreneurs based on socio-economic characteristics

Variable Description	Producers		Marketers		Processors		Total	
	F	%	F	%	F	%	F	%
Age (Years)								
30 – 45	8	5.9	10	11.5	8	9.3	26	8.4
46 – 55	48	35.6	12	13.8	46	53.5	106	34.5
56 – 65	74	54.8	62	71.3	31	36.0	167	54.2
> 65	5	3.7	3	3.4	1	1.2	9	2.9
	Mean = 56.24		**Mean = 57.15**		**Mean = 53.33**		**Mean = 55.69**	
	SD = ± 6.685		**SD = ± 6.588**		**SD = ±6.627**		**SD = ± 6.792**	
Sex								
Female	101	74.8	62	71.3	77	89.5	240	77.9
Male	34	25.2	25	28.7	9	10.5	68	22.1
Marital Status								
Married	124	91.9	87	100.0	84	97.7	295	95.8
Single	0	0	0	0.0	1	1.2	1	0.3
Widow	11	8.1	0	0.0	1	1.2	12	3.9
Household Size								
< 5	0	0.0	0	0.0	1	1.2	1	0.3
5 – 8	3	2.2	1	1.1	2	2.3	6	1.9
>8	132	97.8	86	98.9	83	96.5	305	97.7
	Mean = 7.07		**Mean = 7.28**		**Mean = 6.99**		**Mean = 7.11**	
	SD = 1.368		**SD = ±1.318**		**SD = 1.427**		**SD = ± 1.371**	
Education								
Primary	5	3.7	9	10.3	11	12.8	25	8.1
Secondary and above	100	96.3	78	86.6	75	89.6	207	67.2
Household Type								
Female headed	14	10.4	4	4.6	8	9.3	26	8.4
Male headed	121	89.6	83	95.4	78	90.7	282	91.6
Experience								
< 25 years	10	7.4	2	2.3	8	9.3	12	3.9
25 – 50	109	80.7	66	75.9	73	84.9	166	54.0
51 – 75	16	11.9	19	21.8	5	5.8	130	42.1
	Mean = 39.87		**Mean = 42.53**		**Mean = 36.87**		**Mean = 39.78**	
	SD = ±9.766		**SD = ± 9.281**		**SD = ± 10.160**		**SD = ± 9.942**	

Source: ***Field Survey, 2011***

5.3.0 Section 2: Entrepreneurs' enterprise characteristics

The enterprise characteristics of entrepreneurs considered are income per annum, type of enterprise, marketing outlets, farm size, source of land acquisition, other crops cultivated/marketed/processed, source of labour, and source of fund, cassava variety planted and means of transportation. The responses of entrepreneurs (producers, marketers and processors) are presented in table 4.

5.3.1 Income per annum

The income distribution of the respondents as presented in Table 4 shows that mean annual income for cassava entrepreneurs was ₦249, 65.1 ±75.59. Across entrepreneurs' categories, mean income for producers, marketers and processors were ₦239, 351 ±39.56, ₦225395 ± 32.59 and ₦275771.7± 03.17 respectively. The result also reveals that most producers (36.8%), processors (46.5%) and marketers (57.5%) earned between ₦200, 001to ₦ 300,000 per annum. This means that cassava entrepreneurs in the study area are generally low-income earners. The result was expected in view of the fact that most entrepreneurs operate at low scale. This implies that the entrepreneurs will not have enough capital to procure modern productive technologies that can ease their activities, enhance their output, benefits and socio-economic status. This calls for a careful review of the potentials of cassava as a foreign exchange earner in Nigeria. The result supports the finding of Odoemenem and Otanwa (2011) that respondents in cassava enterprise earn less than #300 per month in Benue state, Nigeria.

5.3.2 Marketing outlets

In the same Table 4 most entrepreneurs (96.8%) market their produce through middle men. Across entrepreneurs' categories, most producers (97.7%), marketers (97.7%) and processors (94.7%) also used middle men as marketing channel. This

means that the involvement of middlemen in cassava distribution system is elaborate and preferably used by the entrepreneurs in the area. This is in line with the findings of Nweke, Spencer and Lynam (2002) and FIIRO (2006) that cassava products distribution in Nigeria is mainly through the middlemen.

5.3.3 Farm Size

It is also evident in Table 4 that the mean farm size of most producers (74.8%) was between 1.5 to 2 hectares. The result is line with a priori expectation because land tenure system that fragments land among family members is in vogue in the study area. The result implies that cassava production will remain at subsistence level and in the hands of small scale producers who may be involved in other activities other than cassava enterprise. The result is consistent with the finding of Asiedu and Okon (2007), Doss and Moris (2010), IAASTD (2009) and Nandi *et al*. 2011) that most farmers in Nigeria operate on farm holdings of less than 2 ha.

5.3.4 Source of land/shop acquisition

Table 4 further presents the result of source of land/shop acquisition. It reveals that majority (82.8%) of the entrepreneurs acquired land/shops from their families. Across entrepreneurs' categories, most producers (88.1%), marketers (87.4%) and processors (69.8%) also acquired land/shop for their respective activities from their families. This has implication for sustainability of the enterprise. The fragmentation of family land among members will someday pose a constraint of no land to share. It also limits opportunity for expansion as a small fragment is ever available for a particular member of the household to use. It thus restricts them to small holding subsistence farming enterprises. Their logic is that family land/shop acquisition subdivides land into smaller plots, and thus prohibits land accumulation to active entrepreneurs and hinders investment. The result is expected as the age long

traditional means of land/shop acquisition from families for most agro-enterprise is still in practice. The result is consistent with Agbo (2006) and Nandi *et al*. (2011) who listed family as a major source of land/shop acquisition for agribusiness in Nigeria.

5.3.5 Other crops cultivated/marketed/processed

Table 4 reveals that most entrepreneurs combined cassava enterprise with other agro income generating activities that included: maize (97.7%), yam (62.3%), and melon (65.3%). Across entrepreneurs' categories, most producers cultivated cassava with maize (96.2%), yam (85.9%) and melon (egusi) (74.1%) and fluted pumpkin (45.9%), vegetable (97.8%), marketed *garri* (74.8%) and *fufu* (97.8%), while marketers combined cassava marketing with sale of maize (97.7%), yam (87.4%), vegetable (95.4%), melon (50.6 %) and pumpkin (52.9%). Also, processors integrated processing of maize (100.0%), and melon (66.3%), with the marketing of cassava tubers (66.3%), stem cuttings (94.2%), *garri* (69.8%) and *fufu* (94.2%). The result is typical of the study area given the common trend of entrepreneurs having combinations of livelihood activities to spread risks, cope with income insufficiency, compensate for failures in market credits, and improve food security. This implies that the system is the best agro-business approach to maximize the use of resources and the output per land area for entrepreneurs. The result is consistent with the observation of Fabusoro (2005) that recent development in micro and macro-economic environment has brought about increasing pressure on agro-enterprise income and has stimulated a search for alternative sources of generating additional revenue among rural farm enterprise households in developing nations.

5.3.6 Source of labour

The entrepreneurs' source of labour is presented in Table 4 below. The result indicates that most entrepreneurs made use of paid/hired labour (94.5%), self labour (93.5 %) and family labour (86.0%). Across entrepreneurs' categories, producers used paid/hired labour (97.0%), self labour (93.5%) and family labour (86.0%). Similarly, most marketers used paid/hired labour (98.9%), self labour (97.7%) and family labour (89.7%), while processors' major sources of labour included: self labour (97.7%), family labour (96.5%) and paid/hired labour (86.0%). The result is line with a priori expectation in view of the predominance of aged entrepreneurs who cannot cope with the drudgery associated with cassava enterprise. The result also implies that some of the family members may be involved in other activities other than cassava enterprise. The finding is in line with Obibuaku (1999) who reported preference for paid/hired labour, self labour and family labour sources in south eastern, Nigeria.

5.3.7 Source of finance

The results in Table 4 reveals that majority (92.2%) of entrepreneurs sourced their finance from personal savings. Across entrepreneurs' categories, most producers (92.2%) marketers (87.4%) and processors (100.0%) also got their finance through personal savings. The result is line with a priori expectation given the uncertainty that characterise other sources of finance and entrepreneurs' involvement in several other activities (wage employment, weaving, petty trading, farm produce processing, community labour and arable farming) from which, they could make some savings for cassava enterprise. This implies that entrepreneurs cannot venture into large scale cassava enterprise as a result of little savings; though they are likely to be more committed having invested their hard earned savings. The finding is consistent with Gwary, Pur and Bawa (2008) and Nandi *et al*. (2011) who reported that personal

savings was a major source of finance for most agro entrepreneurs in Askira/Uba Local Government of Borno state and Obubra Local Government Area of Cross River state, Nigeria respectively.

5.3.8 Cassava varieties planted

Table 4 further shows that most (97.4%) of producers planted both local and improved cassava varieties. The result was expected due to high cost of improved stem cuttings as well as prevalence and easy access to local stem cuttings in the area. The result implies that the location of National Root Crop Research Institute (NRCRI) Umudike has not appreciably influenced availability and outright adoption of improved cassava varieties in the study area. The result is in tandem with the finding of Ezebuiro (2004) that despite availability of improved cassava varieties in south eastern Nigeria, cultivation of improved varieties alongside with the local variety are still in practice.

5.3.9 Means of transportation

Various means of transportation were identified to be in use by the respondents in the study area. According to the result as presented in the Table 4, motorcycle (96.8%), bicycle (91.6%), pick-up van (88.6%) and hand drawn trucks/wheel barrows (84.4%) were means of transportation by most entrepreneurs. Results across categories of entrepreneurs also show that among producers, means of transportation used included: motorcycle, (96.3%) bicycle (94.8%) pick up van (80.0%) and hand drawn trucks/wheel barrow (80.0%). Motorcycle (96.6%) bicycle (95.4%), pick-up van (93.1%), and truck/wheel barrow (90.8%) were also major means of transportation among marketers. Results also reveal that motorcycle (100.0%), pick-up van (97.7%), hand drawn truck/wheel barrow (84.9%), bicycle (80.2%) and boat (51.2%) were used by most processors as means of transportation.

The high percentages for motorcycle and bicycle were expected given the current level of rural poverty and consequent influx of motorcycles and their use as means of livelihood by riders in rural communities. The result depicts availability, accessibility, affordability and usability of these means of transportation as well as their sustainability among entrepreneurs. The use of boat is also an indication of palpable inadequate or poor, rugged and narrow feeder roads for better vehicular movement especially in the riverine areas of Oguta, Ohaji and Ekpoma. The result is consistent with the report of Dipeolu *et al*. (2001) that due to long distances between scattered farms and points of processing and final destination markets, means of transport has considerably changed; motorcycle, bicycle, panel and pick-up vans, and trucks are the most commonly used means of transportation in Nigeria.

Table 4: Distribution of entrepreneurs based on enterprise characteristics

Variable Description	Producers (n=135)		Marketers (n=87)		Processors (n=86)		Total (n=308)	
	F	%	F	%	F	%	F	%
Income								
<100,000	23	17.0	8	20.9	7	8.0	48	15.6
100,001-200,000	30	36.3	17	19.8	6	6.9	53	17.2
200,001-300,000	50	36.8	40	46.5	15	57.5	140	45.5
300,001-400,000	19	14.1	16	7.0	20	29.9	45	14.6
<400,000	13	9.6	5	5.8	41	4.6	22	7.1
	239351.01± 39.56		225395.01 ± 32.59		275771.7± 03.17		249651.1±75.59	
Marketing outlets								
Farm gate	3	2.2	2	2.3	5	5.3	10	3.2
Middlemen	132	97.8	85	97.7	85	94.2	298	96.8
Farm Size								
≤ 0.5ha	6	4.0	0	0.0	0	0.0	6	4.0
0.6 to 1ha	9	6.6	0	0.0	0	0.0	9	6.6
1 to 1.5ha	19	14.1	0	0.0	0	0.0	19	14.1
1.5ha to 2ha	101	74.8	0	0.0	0	0.0	101	74.8
	1.68± 0.95							
Source of land/shop								
Rented/lease	81	60.0	51	58.6	39	45.3	171	55.5
Family	119	88.1	76	87.4	60	69.8	255	82.8
Communal	23	17.0	2	2.3	26	30.2	51	16.6
Outright Purchase	73	54.1	68	78.2	48	55.8	189	61.4
Government	3	2.2	1	1.1	22	25.6	26	8.4
Other crops cultivated/sold/processed								
Maize	130	96.3	65	97.7	86	100.0	301	97.7
Yam	116	85.9	76	87.4	0	0.0	192	62.3
vegetable	132	97.8	83	95.4	0\	0.0	215	69.8
Melon	100	74.1	44	50.6	57	66.3	201	65.3
Pumpkin	62	45.9	46	52.9	21	24.4	129	41.9
Garri	101	74.8	0	0.0	60	69.8	161	52.3
Stem cutting	0	0.0	0	0.0	85	94.2	85	27.6
Cassava tubers	0	0.0	76	87.4	57	66.3	133	43.2
Fufu	132	77.8	0	0.0	85	94.2	217	70.5
Source of labour								
Family	104	77.0	78	89.7	83	96.5	265	86.0
Paid labour	131	97.0	86	98.9	74	86.0	291	94.5
Friends	17	12.6	7	8.0	28	32.6	52	16.9
Self	119	88.1	85	97.7	84	97.7	288	93.5
Source of fund								
Personal savings	122	90.4	76	87.4	86	100.0	284	92.2
Credits from banks	38	28.1	32	36.8	13	15.1	83	23.9
Inheritance	11	8.1	1	1.1	20	23.3	32	10.4
Gifts/donations	7	5.2	4	4.6	3	3.5	14	4.5
Transportation								
Trailer	1	0.7	0	0.0	0	0	1	0.3
Truck	108	80.0	79	90.8	73	84.9	260	84.4
Motorcycle	128	94.8	84	96.6	86	100.0	298	96.8
Head porterage	25	18.5	15	17.2	10	11.6	50	16.2
Pick up van	109	80.0	81	93.1	84	97.7	273	88.6
Bicycle	130	96.3	83	95.4	69	80.2	282	91.6
Boat	40	29.6	20	23.0	44	51.2	104	33.8
Cassava varietiesplanted								
Both variety	132	97.8	0	0	0	0	132	97.8
Local variety	2	2.2	0	0	0	0	2	2.2

Source: Field Survey, 2011

5.4 Section 3: Entrepreneurs' level of involvement in cassava enterprise

The section discusses the entrepreneurs' level of involvement in cassava enterprises in the study area. The distribution of the entrepreneurs is presented in Table 5.

From the findings as shown in Table 5 majority of cassava producers were always involved in production of cassava stem cuttings (91.2%) and fresh root tubers (98.5%). Results also reveal that garri (96.6%), stem cuttings (74.7%), *fufu* (67.8%) and fresh tubers (65.5%) were marketed always, as well as processing of *fufu* (84.9%) and garri (59.3%). The results further show that based on the weighted scores, fresh root tubers, *fufu* and *garri* ranked first among products always produced, processed and marketed by the respective entrepreneurs. Stem cuttings, garri and marketing of stem cuttings ranked second as products that were always carried out by the producers, processors and marketers respectively. The result was in line with a priori expectation and is a true indication of wider preference, acceptability, consumption and demand for gari, *fufu* and tapioca in the study area and beyond. The result is in line with the finding of Nweke (1995) and Onabulu (2001) that 70% of cassava produced in Nigeria is processed into gari and *fufu*, which are the most traded cassava products in Nigeria.

Table 5: Distribution of entrepreneurs based on level of involvement in cassava enterprise

Variable Description	Always		Occasionally		Not At all		Weighted Score	Rank
	F	%	F	%	F	%		
Producer:								
Producing Stem Cuttings	123	91.2	11	8.1	1	0.7	190.5	2nd
Producing fresh root tubers	133	98.5	1	0.7	1	0.7	197.7	1st
Processor								
Processing fresh tubers into flour	0	0.0	10	11.6	76	88.4	11.6	4th
Processing fresh tubers into chips	0	0.0	10	11.6	76	88.4	11.6	4th
Processing fresh roots into starch	1	1.2	1	1.2	84	97.7	3.6	5th
Processing fresh roots into *garri*	51	59.3	19	22.1	16	18.6	140.7	2nd
Processing fresh roots into tapioca	11	12.8	63	73.3	12	14.0	98.9	3rd
Processing fresh roots into *fufu*	73	84.9	11	12.8	2	2.3	182.6	6th
Marketer								
Marketing fresh tubers	57	65.5	18	20.7	12	13.8	151.7	2nd
Marketing cassava chips	20	23.0	2	2.3	65	74.7	48.3	6th
Marketing cassava flour	19	21.8	5	5.7	63	72.4	49.3	5th
Marketing cassava starch	10	11.5	0	0.0	7	8.5	23.0	23rd
Marketing stem cuttings	65	74.7	6	6.9	16	18.4	156.3	2nd
Marketing *garri*	84	96.6	0	0.0	3	3.4	193.2	1st
Marketing tapioca	18	20.7	21	24.1	48	55.2	65.5	4th
Marketing *fufu*	59	67.8	7	8.0	21	21.1	143.6	3rd

Source: ***Field Survey, 2011***

5.4.1: Entrepreneurs' level of involvement in cassava enterprise

Table 6 presents entrepreneurs level of involvement in cassava enterprise in the study area. It is shown in Table 6 that most entrepreneurs (83.4%) were highly involved in cassava enterprise. The result across entrepreneurs' categories also reveals that involvement in cassava enterprise by most producers (91.1%), marketers (58.6%) and processors (96.5%) was high. This shows that the entrepreneurs were highly involved in the enterprise. This result establishes the level of importance of the enterprise in the study area. The result was expected because cassava itself is a staple commodity in the study area. The result is in tandem with the report of Nzekwe and Afolabi (2001) that enhanced involvement of people in cassava enterprise is as a result of increased demand for cassava products in and outside rural communities.

Table 6: Entrepreneurs' level of involvement in cassava enterprise

Level	Producer			Marketers			Processors			Overall		
	Score	**F**	**%**	**Score**	**F**	**%**	**Score**	**F**	**%**	**Score**	**F**	**%**
Low	2-3.8	12	8.9	2-6.8	36	41.4	3-4.3	3	3.5	2-4.8	51	16.6
High	3.9-4	123	91.1	6.9-10	51	58.6	4.4-6.0	83	96.5	4.9-10	257	83.4
Mean	**3.90±0.35**			**6.92±1.62**			**4.42±0.73**			**4.90±1.61**		

Source: Field survey, 2011

5. 5 Section 4: Entrepreneurs' scale of operation in cassava enterprise

5.5.1 Producers

The entrepreneurs' perception of their scale of operation is discussed in this section. The distribution of entrepreneurs is presented in Table 7.

The result in Table 7 reveals that fresh tubers (97.0%) and stem cuttings (97.0%) were produced at small scale. This is expected because of the small farm size of most entrepreneurs in the area. The result suggests that interventions of the government and other agencies have not succeeded in boosting the production level of most entrepreneurs in the study area. The result confirms the findings of Lucas (2007), Oyewole *et al*. (2001), Omonona (2009), Oyegbami *et al*. (2010) and Nweke *et al*. (2002) that there were few medium and large scale producers of cassava in Nigeria.

Table 7: Distribution of cassava producers based on scale of operation in cassava enterprise

Variable Description	Small Scale		Medium		Large	Scale
Producer	**F**	**%**	**F**	**%**	**F**	**%**
Producing fresh tuber	131	97.0	3	2.2	0	0.0
Producing stem cuttings	131	97.0	2	1.5	1	0.7

Source: ***Field Survey, 2011***

5.5.2: Cassava processors' scale of operation in cassava enterprise

Processors scale of operation was analyzed in Table 8. The results in Table 8 show that garri (98.8%), fufu (98.8), tapioca (95.3%) and chips (90.7%) were processed at small scale. The result is in line with *a priori* expectation because of inadequacy of modern processing technology and prevalence of traditional processing technologies in the area which do not promote large scale processing of the products. The result is an indication of continuity in post-harvest losses and decline in the nation's food output which calls for urgent rural infrastructural transformation. The result implies that Nigeria will continue to lag behind in exportation of these products. The result is in line with the findings of Sanni *et al*. (2009) and Ekwe *et al*. (2009) that production and processing of most traditional foods or intermediate products, such as *fufu*, gari, flour, tapioca, chips and starch are mainly carried out by micro and small-scale processors.

Table 8: Distribution of cassava processors based on scale of operation in cassava enterprise

Variable Description	Small Scale		Medium		Large scale	
Processor	**F**	**%**	**F**	**%**	**F**	**%**
Processed cassava tuber into flour	0	0.0	0	0.0	0	0.0
Processed fresh tuber into chips	0	0.0	0	0.0	0	0.0
Processed of fresh roots into starch	0	0.0	0	0.0	0	0.0
Processed fresh tuber into gari	85	98.8	1	1.2	0	0.0
Processed fresh tuber into tapioca	82	95.3	1	1.2	0	0.0
Processed fresh tuber into *fufu*	85	98.8	1	1.2	0	0.0

Source: ***Field Survey, 2011***

5.5.3: Cassava marketers' scale of operation in cassava enterprise

The scale of operation of cassava marketers is presented in Table 9. The result indicates that a large percentage of the respondents marketed gari (100.0%), stem cuttings (100.0%), *fufu* (100.0%), flour (73.6%), fresh tubers (71.3%), starch (64.4%) and chips (56.3%) were carried out on small scale. The result is expected in view of the low level of marketing infrastructural development in the area. The result is also expected in view of the cyclic tendency of production. It is obvious that following unreliable and unpredictable increases and decreases in supply and demand for cassava products in addition to processing efficiency and price, the scale of marketing operation is likely to be affected. The result implies that small scale marketing will continue to prevail in the area unless there is remarkable policy framework and implementation in cassava production and processing as well as marketing and consumption of cassava products in the area. Provision of interest free loan with no land collateral but that guarantors are used is a sine qua non to enhancing entrepreneurs' scale of operation, benefits and socio-economic status. The result is line with the finding of FIIRO (2006) that cassava trade in Nigeria is very erratic; and in the hands of small scale entrepreneurs who consumed large proportion of their output, and sold whatever remains in the local market.

Table 9: Distribution of cassava marketers based on scale of operation in cassava enterprise

Variable Description	Small Scale		Medium Scale		Large Scale	
	F	%	F	%	F	%
Marketing fresh tubers	62	71.3	25	28.7	0	0.0
Marketing cassava chips	49	56.3	0	0.0	0	0.0
Marketing Cassava Flour	64	73.6	0	0.0	0	0.0
Marketing Cassava Starch	56	64.4	0	0.0	0	0.0
Marketing Stem Cuttings	87	100.0	0	0.0	0	0.0
Marketing *Garri*	87	100.0	0	0.0	0	0.0
Marketing of tapioca	32	36.8	0	0.0	0	0.0
Marketing of *Fufu*	87	100.0	0	0.0	0	0.0

Source: ***Field Survey, 2011***

5.5.4 Quantity of fresh tubers produced in bags/ stem cuttings in bundles

Table 10 reveals that majority (87.4%) produced between 1 – 800 bags of fresh tubers with the mean of 308.96 bags. Results also show that 76.1% produced between 1-400 bundles of stem cuttings with mean of 259.59 bundles cassava stem cuttings. The result is expected because of entrepreneurs' apathy to wholesome adoption of fast-growing and disease resistant cuttings that can boost productivity. This implies a challenge to change agents in creating awareness and knowledge among entrepreneurs on the need for improved cultivation of improved varieties. This confirms the report of Lawrence *et al*. (2006) and Ezulike *et al*. (2006) that small scale production is a characteristic feature of cassava production in Nigeria.

Table 10: Distribution of cassava producers based on quantity of fresh tuber produced in bags/ stem cuttings in bundles

Variable Description	Score range (bags)	F	%	Mean	SD
Quantity of Fresh Tuber Produced in bags:					
Low	1 – 800	118	87.4	308.96	358.40
Medium	801 -1600	16	11.9		
Large	1601 -2400	1	0.7		
Quantity of Stem Cuttings Produced in bundles					
Low	1 -400	102	76.1	259.59	289.58
Medium	401 – 800	21	15.7		
Large	Above 800	11	7.0		

Source: ***Field Survey, 2011***

5.5.5 Quantity of flour processed in bags

Analysis on the quantity of flour processed in bags as presented in Table 11 reveals that most processors (97.7%) processed between 1-350 bags of *garri*, while 98.8% processed between 1-200 bags of *fufu* with the mean bags of 81.88 and 46.37 bags respectively. The result is contrary to *a priori* expectation. It is expected that there will be cassava starch and flour marketing boom in the area in view of Federal Government legislation on the mandatory inclusion of 10 percent cassava flour in wheat flour for baking bread. The result is an indication that South eastern Nigeria has not progressed beyond subsistence level in cassava flour processing and could be due to absence of appropriate and affordable modern processing technologies. The result is an indication that previous efforts to develop appropriate technology for cassava processing and dissemination especially during the Olusegun Obasanjo administration did not achieve the desired result. The result is a message to relevant policy makers that the development and growth of small-scale flour processing enterprise which is supposed to be based on the existence of some level of entrepreneurial climate or enterprise culture, supported by a well-defined institutional structure amongst the people, is far from being achieved in the study area. The is consistent with the observation of Collaborative Study of Cassava in Africa (COSCA) (1999), that manual grating of cassava is practiced in most areas despite presumed popularity of mechanized cassava grater in Nigeria and the consequences are low productivity and reduced quality of processed cassava products.

Table 11: Distribution of cassava processors based on quantity of flour processed in bags

Variable Description	Score range (bags)	F	%	Mean	SD
Quantity of Fresh Tuber Processed into *garri*					
Low	1 – 350	84	97.7	81.9	120.6
Medium	351 – 700	1	1.2		
Large	Above 700	1	1.2		
Quantity of fresh roots processed into *fufu*					
Low	1 to 200	85	98.8	46.4	56.1
Medium	201 to 400	0	0.0		
Large	Above 400	1	1.2		

Source: *Field Survey, 2011*

5.5.6 Quantity of cassava products marketed

Table 12 shows the quantity of cassava products marketed by the respondents. The result reveals that marketing of fresh tubers (96.6%,), bundles of stem cutting (85.1), *garri* (97.7%,) and *fufu* (97.6%,) were at small scale of 1 – 750 bags, 1 – 350 bundles, 1 – 350 bags and 1 – 300 bags respectively. The mean values were 7.21 fresh tubers, 192.26 bundles of stem cuttings, and 88.07 bags of *fufu*. The result is contrary to *a priori* expectation given the importance of these items and the fact that *garri* and *fufu* constitute daily meal for people in the area. The result indicates that the marketers are lacking in working capital and cannot expand their scale of operation. This further implies that the sub-sectors' capacity to serve as the pivot for the drive to reduce poverty and meet the socio-economic needs of the people is in question. The finding is consistent with FIIRO (2006) that cassava marketing in Nigeria has been rather erratic and in the hands of numerous farmers who consumed the bulk of their output and sold whatever that remained in the local market. The report maintained that this is one of the major reasons Nigeria plays a negligible role in cassava marketing across her boarders.

Table 12: Distribution marketing entrepreneurs based on quantity of cassava products marketed

Variable Description	Score range (bags)	F	%	Mean	SD
Quantity of Fresh Tuber marketed					
Small	1 – 750	84	96.6	745.2	96.9
Medium	751 – 1500	2	2.3		
Large	Above 1500	1	1.1		
Quantity of cassava cuttings marketed in bundles					
Small	1 – 350	74	85.1	192.3	91.6
Medium	351 – 700	11	12.6		
Large	Above 700	2	2.3		
Quantity of cassava *garri* marketed in bags					
Small	1 – 350	85	97.7	89.7	24.9
Medium	351 – 700	1	1.1		
Large	Above 700	1	1.1		
Quantity of tapioca marketed in bags					
Small	1 – 20	20	23.0	11.8	7.6
Medium	21 – 40	8	9.2		
Large	above 40	4	4.6		
Quantity of *fufu* marketed in bag					
Small	1 – 300	82	97.6	88.1	10.3
Medium	301 – 600	1	1.2		
Large	Above 600	1	1.2		

Source: ***Field Survey, 2011***

5.6 Section 5: Entrepreneurs intervention programmes in cassava enterprise

The focus of this section is to ascertain the intervention programmes for cassava enterprise in the study area. The distribution of respondents is as shown in table 13 below.

5.6.1 Agricultural Development Programmes (ADP)

As shown in Table 13 most producers got processing equipment (75.6%), agro-chemical (78.5%), improved cassava stem cuttings (74.1%) and extension services (67.4%) intervention from ADP. The result also reveals that ADP's intervention in cassava marketing includes; processing equipment (82.8%), extension services (79.3%), agro-chemical (74.7%) and marketing outlets (65.5%) while intervention in cassava processing were mostly extension services (75.6%) and processing equipment (61.6%). This was expected in view of ADP's radio and television programmes in the area which was aimed at enlightening and sensitizing entrepreneurs towards enlisting into relevant co-operative societies for easy access to intervention packages by government and other donor agencies. The result is an indication that ADP is relatively living up to its philosophy that anchors on rural infrastructure and inputs delivery to rural farming communities. The result is in line with the finding of Nweze (2002) that in many states, ADP remarkably improved access to improved farming technologies, especially improved seeds, fertilizers, agro-chemicals and improved processing techniques.

5.6.2 Fadama

From the analysis in Table 13 few producers (14.1%) attested to Fadama intervention in production/distribution of improved cassava cutting, construction of access road (13.3%), agro-chemical (12.6%) and development of equipment for processing cassava products (10.4%). The result also reveals that FADAMA

intervention in cassava marketing was in provision of marketing outlets (19.5%). On the other hand, intervention in processing was found to be in provision of machinery (83.3%).The low intervention was in line with *a priori* expectation because FADAMA (Hausa word for the low-lying flood-prone lands found in the plains of rivers) is not popular and viable yet in the study area notwithstanding the prominence of River Niger, Imo River, Ulasi and numerous tributaries and streams that are capable of providing enormous low land and basins for fadama development in the area. The result indicates the need for the development of those viable tributaries and streams by relevant stakeholders for fadama activities in the study area. This will empower and improve the socio-economic status of the entrepreneurs. The result is in line with the observation of World Bank (2003a) that though fadama is not new in Nigeria, it is a major pre-occupation of the peasant farmers in northern Nigeria who grew mainly vegetables, sugar-cane and fruits during dry seasons through irrigation; thus, the low utilization of fadama resources in other places.

5.6.3 United States Aid for International Development (USAID)

As shown in Table 13 majority of the producers (99.3%) did not receive any intervention from USAID. The result was not expected in view of government's pronouncement that USAID/Nigeria and Shell Petroleum Development Company (SPDC) in association with IITA under the activity to be known as "Cassava Enterprise Development Project (CEDP) will support Nigeria's Presidential Cassava Initiative by strengthening human and institutional capacity of producers, processors, commodity traders and fabricators to produce, process and market cassava efficiently (IITA, 2005). The result implies that USAID as agency is not popular in the area. The result contradicts the position of Udeajah , (2004) that United States Agency for International Development (USAID) in collaboration with Shell Petroleum

Development Company of Nigeria Limited (SPDC) advanced $20 million for the development of cassava, under the Cassava Enterprise Development Project (CEDP).

5.6.4 Niger-Delta Development Commission (NDDC)

Results in Table 13 indicate that producers got agro-chemical (68.9%) while marketers (54.0 %) and processors (41.9%) got capital intervention from NDDC. The relative low intervention by NDDC is expected because not all the areas within study area were grouped under NDDC states. Thus, only entrepreneurs within NDDC coverage were possible beneficiaries to available NDDC intervention programmes in the study area. The result implies however, that NDDC's intervention falls below expectations and should have transcended beyond agro-chemicals and capital incentives to providing other systematic support that can unchain the potentials of cassava enterprise in the area. The finding is line with Akpan (2006) who found out that NDDC had in collaboration with Federal, State and Local Governments and IITA given agro-chemicals and capital incentive to people.

5.6.5 Religious organisations

The result shows that production/distribution of improved cassava cutting (67.4%), agro-chemical (60.7%), land (52.6%s) and labour (48.1%) were areas of intervention by religious organisations (e.g. Catholic Laity Council and Catholic Women Organisation) for cassava production. The result was not expected in view of the fact that religious organisations were known mainly for their spiritual, moral and faith building obligations. The result is an indication of the changing roles and responsibilities of religious organizations from their original spiritual and moral dimensions to active food production participation. The result is consistent with the submission of Onaiyekan (1984), Adedoyin and Ngoyi (1996) that the church has gradually moved into agricultural development projects to ensure that basic means of

food production and processing are made available for the poorest and most neglected segment of society that form majority of rural farming population.

5.6.6 National Root Crops Research Institute (NRCRI)

Table 13 further shows that majority (62.3 %) of producers got improved cassava cuttings. The result implies that NRCRI to a large extent restricted itself to its mandate of producing and distributing improved cassava stem cuttings in the study area. Although, it was expected that NRCRI could have gone beyond production and distribution of improved cassava stem cuttings to extension service delivery, organization of workshop and training and designing and fabrication of simple agricultural farm tools and equipment. Perhaps, the presence of ADP may have been the reason for these limited areas of intervention. The result is in line with the finding of Nweke (2002) that combined efforts of NRCRI and IITA had led to production and release of improved cassava varieties in Nigeria.

5.6.7 Oil companies

The result in Table 13 indicates that incentives provided mostly by oil companies include cassava production extension services (100.0%), agro-chemicals (58.5%) and capital (58.5%). Also majority (56.3%) of marketers got capital incentive while processors got capital (48.8%) and extension service (41.9%) intervention of oil companies. The result was contrary to *a priori* expectation considering the number of multi-national oil companies in and around the study area. The result implies that the entrepreneurs will continue to have conflicts with oil companies over activities that are not environmentally friendly in the area. The result is in tandem with the submission of SPDC (2011) that most cassava producers and processors have been linked to service providers such as chemical companies, tractor hiring services, and micro-credit schemes by SPDC.

Table 13: Distribution of entrepreneurs based on cassava enterprise intervention programmes

Interventions	Agencies						
	ADP %	Fadama %	USAID %	NDDC %	Rel. organ %	NRCRI %	Oil. comp %
Producer							
Improved cuttings	74.1	14.1	0.7	23.0	67.4	62.3	21.5
Marketing outlets	62.4	0.0	0.0	0.0	0.0	0.0	0.0
Agro-chemicals	78.5	12.6	0.7	68.9	60.7	0.0	58.5
Land/shop	36.3	0.0	0.0	0.0	52.6	0.0	14.8
Capital	5.9	1.5	0.0	38.5	5.9	0.0	58.5
Labour	0.0	0.0	0.0	0.0	48.1	0.0	0.0
Machinery	28.1	0.7	0.0	26.4	17.8	0.0	0.7
Extension service	67.4	0.7	0.0	0.0	0.0	0.0	0.0
Provision of market	18.5	0.7	0.0	0.0	0.0	0.0	0.0
workship/training	18.5	3.7	0.0	22.2	0.0	0.0	3.7
Processing equipt	75.6	10.4	0.0	0.0	0.0	0.0	0.0
Est. proc. Centers	11.1	6.7	0.0	10.4	28.1	0.0	10.4
Const of road	31.9	13.3	0.0	40.7	0.0	0.0	24.4
Marketer							
Marketing outlets	65.5	19.5	0.00	0.0	0.0	0.0	0.0
Agro-chemicals	74.7	0.0	0.00	0.0	0.0	0.0	0.0
Land/shop	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	3.4	0.5	0.0	54.0	0.0	0.0	56.3
Labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Extension service	79.3	0.0	0.0	0.0	0.0	0.0	59.3
Provision of market	18.5	0.0	0.0	0.0	0.0	0.0	0.0
Worship/training	4.6	0.0	0.0	9.2	0.0	0.0	3.4
Processing equipment	82.8	0.0	0.0	0.0	0.0	0.0	0.0
Proc. Centers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Processor	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Improved cuttings	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agro-chemicals	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land/shop	40.7	0.0	0.0	0.0	0.0	0.0	0.0
Capital	17.4	3.5	0.0	41.9	18.6	0.0	48.8
Labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery	22.1	83.3	0.0	3.5	14.0	0.0	1.2
Extension service	75.6	9.3	0.0	0.0	0.0	0.0	41.9
Provision of market	18.6	5.8	0.0	0.0	0.0	0.0	0.0
Worship/training	4.6	11.6	0.0	3.5	7.0	0.0	10.5
Processing equipt	61.6	5.0	0.0	5.8	15.1	0.0	0.0
Est. of proc. Centers	34.9	0.0	0.0	12.8	0.0	0.0	11.6
Const. of road	39.5	4.7	0.0	0.0	0.0	0.0	0.0

Source: ***Field Survey, 2011***

5.7 Entrepreneurs' access to intervention inputs in cassava enterprise

Table 14 presents the analysis of entrepreneurs' access to intervention inputs in cassava enterprise. The result indicates that most entrepreneurs occasionally had access to agro-chemicals (95.5%), cassava stem cuttings (88.6%), extension service (86.0%), workshop and training (85.7%), labour (67.2%), pilot processing centers (66.0%), marketing outlets (52.3%) and capital (31.5%). Across entrepreneurs' categories, most producers occasionally had access to marketing outlets (59.3%), agro-chemicals (96.1%), planting materials (91.9%), stem cuttings (85.2%), extension services (84.4%), labour (62.2%), capital (59.3%), workshop/training (84.4%), market, (79.3%), access road (69.1%) and machinery (65.9 %) intervention of various agencies. Similarly, marketers accessed marketing outlets (93.1%), extension services (87.4%), capital (65.5%) and land/shop (50.5%) occasionally as well as processors to workshop/training (88.4%), extension services (87.2%), capital (9.3%) and pilot processing centers (53.5%). Results on the weighted scores show that agro-chemical (95.5%) ranked first as the most accessed incentive by entrepreneurs while across entrepreneurs' categories (producers, marketers and processors) agro-chemicals (96.3%), marketing outlets (93.1%) and training/workshop (88.4%) respectively ranked first as the most accessed incentive in their respective enterprises. The result was expected in view of the reduced incidence of cassava mosaic disease and people's awareness on improved cassava production in the study area. However, the result on access to market was not expected in view of cases of cassava glut that followed the introduction of cassava Transformation Initiative. The result is an indication that both entrepreneurs enjoyed specific support services that are capable of improving their productivity and benefits. The results corroborate the finding of Asiabaka *et al.* (2001)

that there are productive variations in Nigeria's cassava enterprise arising principally from improved access to intervention inputs.

Table 14: Distribution of entrepreneurs based on access to intervention

Variable Description	Always		Occasionally		Not at all		Weighted	
	F	%	F	%	F	%	Score	Rank
Producer								
Marketing outlets	0	0.0	80	59.3	55	40.7	59.3	7th
Improved cassava cuttings	5	3.7	111	82.2	19	14.1	89.6	3rd
Agro-chemical	2	1.5	130	96.3	3	2.2	99.3	1st
Land	22	16.3	46	34.1	67	49.6	66.7	5th
Capital	0	0.0	80	59.3	55	40.7	59.3	7th
Labour	0	0.0	84	62.2	51	31.8	62.2	6th
Machinery	0	0.0	46	34.1	89	65.9	34.1	8th
Extension Services	0	0.0	114	84.4	21	15.6	84.4	4th
Provision of market	0	0.0	32	23.3	103	76.3	23.3	10th
Training/workshop	0	0.0	21	15.6	114	84.4	15.6	11th
Planting materials	1	0.7	124	91.9	10	7.4	93.3	2nd
Const. of access road	0	0.0	43	31.9	92	68.1	31.9	9th
Marketers								
Marketing outlet	0	0.0	81	93.1	6	6.9	93.1	1st
Land/shop	0	0.0	44	50.5	42	49.4	50.5	4th
Capital	0	0.0	57	65.5	30	34.5	65.5	3rd
Extension Services	0	0.0	79	87.4	11	12.6	87.4	2nd
Provision of market	0	0.0	18	20.7	69	79.3	20.7	6th
Training/workshop	0	0.0	18	20.7	69	79.3	20.7	6th
Access road	1	1.1	38	43.7	48	55.2	43.7	5th
Processors								
Land/shop	4	4.7	34	39.5	48	55.8	48.9	5th
Capital	0	0.0	51	59.3	35	40.7	59.3	3rd
Extension Services	0	0.0	75	87.2	11	12.8	87.2	2nd
Provision of market	1	1.2	15	17.4	70	81.4	19.8	7th
Processing equipment	0	0.0	16	18.6	70	81.4	18.6	8th
Training workshop	0	0.0	76	88.4	10	11.6	88.4	1st
Pilot processing centres	1	1.2	46	53.5	39	45.3	55.9	4th
Land/shop	4	4.7	10	11.6	72	83.7	21.0	6th
Overall								
Marketing outlet	0	0.0	161	52.3	147	47.7	52.3	8th
Improved cassava cuttings	9	2.9	273	88.6	26	8.4	94.4	2nd
Agro-chemical	2	0.6	294	95.5	12	3.9	95.5	1st
Land	53	17.2	97	31.5	158	51.3	65.9	6th
Capital	0	0.0	88	61.0	120	39.0	61.0	7th
Labour	0	0.0	207	67.2	101	32.0	67.2	6th
Extension Services	0	0.0	265	86.0	43	14.0	86.0	3rd
Provision of market	1	0.3	65	21.1	242	78.6	21.1	11th
Training/workshop	0	0.0	264	85.7	44	14.3	85.7	4th
Processing equipment	0	0.0	55	17.9	253	82.1	17.9	12th
Processing centers	3	1.0	205	66.6	100	32.5	68.6	5th
Const. of road	5	1.6	91	29.5	212	68.8	32.7	10th

Source: Field survey, 2011

5.8: Entrepreneurs' level of access to intervention inputs in cassava enterprise

Result on level of access to intervention as shown in Table 15 shows that a large proportion (69.8%) of the entrepreneurs highly accessed intervention inputs from various agencies. The results also reveal that across entrepreneurs' category, majority of producers (60.0%), marketers (87.4%) and processors (67.4%) also enjoyed high level of access to various intervention inputs. The result was not expected in view of entrepreneurs' scale of cassava enterprises in the study area. A higher level of access to intervention inputs by entrepreneurs will mean possible improvement in the productive performance of the enterprise. This may not be unconnected with the constraints of adoption in most communities; where in some instances, they may have access to interventions but due to their cultural background and inhibitions due to illiteracy and lack of appropriate manipulative skills, were unable to utilize the incentives. The result contradicts the finding of International Fund for Agricultural Development (IFAD) (2001) that limited access to intervention inputs is a common phenomenon in Nigeria and a factor that impedes production, processing and marketing of agricultural commodities among peasant farm holdings.

Table 15: Level of access to cassava enterprise intervention

Level	Producer			Marketers			Processors			Overall		
	Scores	**F**	**%**	**Scores**	**F**	**%**	**scores**	**F**	**%**	**Score**	**F**	**%**
Low	0-7	54	40.0	0-8	11	12.6	5-7	28	32.6	0-7	102	30.2
High	8-13	81	60.0	9-12	76	87.4	8-11	58	67.4	8-13	206	69.8
Mean	**8.15 ± 2.37**			**8.94 ± 2.16**			**7.92 ± 1.42**			**8.31 ± 2.12**		

Source: Field survey, 2011

5. 9 Section 6: Entrepreneurs' benefits derived from cassava enterprise

This section discusses benefits derived by entrepreneurs from cassava enterprise in the study area. The distribution of the entrepreneurs is presented in table 16

5.9.1 Food security

The result in Table 16 shows that benefit of food security derived by most entrepreneurs was high during dry season (92.6%) and rainy season (91.2%) while it was moderate during famine (83.8%), crop failure (79.5%) and in all seasons (75.0%). The result also reveals that across entrepreneurs' categories, benefit of food security derived by most producers was high during dry (97.1%) and rainy seasons (95.5%), while it was moderate during famine (83.0 %), crop failure (82.2%) and in all seasons (64.4%). Benefit of Food security derived by most marketers was also high during dry (98.8%) and rainy seasons (97.7%) while it was moderate during all seasons (95.4%), famine (85.1%) and crop failure (81.6%). Table 5.9 also shows that during rainy (79.0%) and dry seasons (77.9%) most processors had high food security while it was moderate during famine (83.7%), crop failure (73.3%) and in all seasons (70.9%). The result is expected considering that cassava is a traditional staple food crop in the area. The result is also a confirmation of the common saying that "there is no hunger with cassava in the land". This implies that cassava enterprise is an all time important venture that can be relied upon for food sufficiency. The result agrees with the position of Kalu (2003) that "there is no famine where cassava enterprise is practiced" thus; cassava is simply a "food security" crop.

5.9.2 Collateral for credit

The result as shown in Table 16 reveals that use of cassava enterprise as collateral for credit from government (86.0%), banks (83.1%) and Cassava Farmers' Association (82.7%) by most entrepreneurs was low. The result shows that across entrepreneurs' categories, the use of cassava enterprise as collateral for credit from government (92.6%), Cassava Farmers' Association (87.4%) and banks (87.2%) by most producers was low. The use of the enterprise by marketers as collateral for credits from government (83.9%), Cassava Farmers' Association (81.6%) and banks 80.5%) was low while it was moderate from family members (45.5%). The result also reveals that using the enterprise as collateral by processors to obtain loans from banks (79.0%), government (78.0%) and Cassava Farmers' Association (75.6%) by processors was low while moderate from family members (75.6%). This was expected as it is culturally forbidden to use ones cassava enterprise as collateral for loan in some communities of the study area. The situation is made worse as women who are more in the enterprise have no absolute rights to ownership of landed properties, not to talk of using them as collateral for loan. This means that cassava enterprise has no wide acceptability to be used as collateral for credit in the study area. It also implies that cassava entrepreneurs may continue to have difficulty in obtaining loan no matter the scale of operation. This result is in line with the findings of Day *et al*. (1996), Okpukpara (2010) and Adeyemo (2008) that banks handling credit funds are found in the cities away from rural communities and demand collateral in form of land (preferably in the cities) or house to some immovable assets as prerequisites for giving loans and accessing such credit is difficult for all types of enterprise.

5.9.3 Improved socio-economic status

Table 16 also shows that most entrepreneurs derived benefits of high recognition (85.7%), income (65.9%) and material possessions (65.3%) while that of chieftaincy title (55.2%) was moderate. The study also reveals that across entrepreneurs' categories, most producers derived benefits of high income (89.6%), material possessions (68.1%) and recognition (60.7%). Most marketers also recorded high benefits in recognition (95.4%), income (74.7%) and material possession (67.8%) while that of chieftaincy titles (67.8%) was moderate. Similarly, most processors derived high benefits of income (69.8%), recognition (65.1%) and material possessions (58.2%) while that of chieftaincy title (54.7%) was moderate. The result was expected as most people in the area are known for their resounding achievements in cassava enterprise. This means that cassava enterprise provides various benefits to all categories of entrepreneurs. The result is consistent with the finding of Achinewhu and Owuamanam (2001) and Beeching *et al*. (2000) that cassava enterprise offers flexibility to resource poor in rural communities serving either as subsistence and generating cash income for most producers, processors, marketers and other agro-industrial stakeholders.

5.9.4 Employment

Further analysis in Table 16 shows that employment benefit was high on part-time (76.6 %) and full-time (50.6%) bases to most entrepreneurs. The result reveals that across entrepreneurs' categories, benefits of providing full-time (74.8%) and part-time (57.0%) employment opportunities were high for producers. Most marketers also derived high full-time (74.7%) and part-time (65.0%) employment benefits while processors similarly derived full-time (50 %) and part-time (44.2%) employment benefits. The result is line with *a priori* expectation as there is hardly any household

in the study area that is not involved in one type of cassava enterprise or the other. The result implies that cassava enterprise is a two edged sword that brings fortune to its bearers from both sides. It further implies that government should embark upon a broad based initiative that should focus on a wide array of activities across the cassava value chain. This should involve provision of business and technical support services and deploying village-level processing units and technologies that ensures consistent product quality. This will aid employment generation especially among youth. The result is in conformity with Odoemenem and Otanwa (2011) who reported that cassava enterprise provides most Nigerians with employment on either full-time or part-time basis.

5.9.5 Improved nutrition

The findings in Table 16 also indicate that most entrepreneurs (73.7%) derived high benefit of improved nutrition. The result also shows that across entrepreneurs' categories, most producers (79.3%), marketers (77.0%) and processors (61.6%) derived benefit of improved nutrition level. The result is expected considering its wide consumption in different product forms with good soup recipe and leguminous crop in the study area. This result means that cassava enterprise is not only a major source of income generation but a rural staple that transforms nutritional status of most entrepreneurs' households. The result corroborates the earlier finding of Uchechi and Ebelenna (2009) that some of the inherent characteristics that make cassava enterprise attractive in Nigeria is that the crop itself is rich in carbohydrate, (starch) and consequently has multiplicity of end products.

5.9.6 Raw materials

Table 16 shows that most entrepreneurs highly benefited from its being raw material for *garri* (100.0%), *fufu* (100.0%), tapioca (54.4%) and livestock feed

production (44.2%). The results also reveal that across entrepreneurs' categories, it provided high benefit of raw material to most producers for *garri* (100.0%) and *fufu* (91.1%) and low for chips (77.1%), starch (75.5%), ethanol (72.6%), flour (61.5%) and tapioca (51.9%). The result also reveals that most marketers derived high raw material benefit for *garri* (94.3%), *fufu* (77.0%) and moderate benefit for livestock feed production (41.2%) while it was low for chips (90.8%), ethanol (87.3%), starch (83.3%), flour 72.4% and tapioca (67.0 %). The result also shows that while the raw material benefit was high for processing *garri* (96.5%) and *fufu* (87.3%), it is moderate for livestock feed (45.3%) and low for processing starch (84.9%), chips (74.4%), flour (66.5%) and ethanol (58.1%) in the study area.

The results from the weighted scores show that producers and marketers mostly benefited food security while it was improved nutrition and raw material for *garri* and *fufu* processors. The result is expected because of local preferences and demand for these products in the area. On the other hand, the low rate of raw material benefit for starch, flour and chips was unexpected because the recent Federal Government policy on mandatory 10% cassava flour inclusion in wheat flour for bread baking was suppose to boost scale of cassava flour production and benefit. The result implies industrial absence and utilisation in the study area. The result corresponds with Ndossi quoted in Gwera (2009), Haggblade and Nyembe (2008) and Westby (2008) that cassava is a potential source of raw materials for pies, bread, pastries, cakes, biscuits, and doughnuts and several categories of traditional products like *fufu*, flours, *garri*, Starches, vegetables and medicines.

Table 16: Distribution of entrepreneurs based on benefits derived from cassava enterprise

	Producers				Marketers N=87				Processors N=86				Total entrepreneurs' = 308			
Variable	**High**	**Moderate**	**Low**	**Weighted scores**	**High**	**Moderate**	**Low**	**Weighted scores**	**High**	**Moderate**	**Low**	**Weighted scores**	**High**	**Moderate**	**Low**	**Weighted scores**
Food Security During	**%**	**%**	**%**		**%**	**%**	**%**		**%**	**%**	**%**		**%**	**%**	**%**	
Dry Season	97.1	1.5	0.0	294.3	98.8	1.1	0.0	298.6*	79.0	19.8	1.2	277.8	92.6	6.5	0.3	291.1
Rainy Season	95.5	3.0	0.0	292.5	97.7	1.1	1.1	296.4	77.9	18.6	2.4	272.6	91.2	6.8	0.9	288.1
All Season	22.9	64.4	7.4	204.9	2.1	95.4	0.0	197.1	16.3	70.9	8.1	198.8	15.2	75.0	5.5	201.1
Famine	3.7	43.4	10.3	108.2	1.1	85.1	10.3	182.7	3.5	83.7	8.2	186.1	2.9	83.8	9.7	186.0
Crop failure	3.7	82.2	10.3	185.8	2.2	81.6	16.1	183.7	1.2	73.3	12.8	163.0	2.6	79.5	12.7	179.5
Collateral for Credit from																
Government	0.7	1.5	92.6	97.7	0.0	0.0	83.9	83.9	1.2	7.0	78.0	95.6	0.6	2.6	86.0	93.0
Association	0.0	0.0	87.4	87.4	0.0	0.0	81.6	81.6	2.4	5.8	76.7	95.5	0.6	1.6	82.7	87.7
Banks	0.0	1.5	87.4	90.4	0.0	2.3	80.5	85.1	0.0	5.8	79.0	90.6	-	2.9	83.1	88.9
Family	5.2	45.2	42.2	148.2	0.0	41.4	42.5	125.3	1.2	75.6	14.0	168.8	-	-	-	
Friends	3.7	82.2	10.3	185.8	2.2	81.6	16.1	183.7	12	73.3	12.8	163.0	2.6	79.5	12.7	178.5
Improved SES																
Income	60.7	34.8	1.5	252.8	74.7	19.5	0.0	263.1	65.1	10.5	1.2	213.5	65.9	23.7	0.9	246.0
Chieftaincy	37.8	47.4	8.2	216.4	21.8	67.8	4.5	205.5	3.5	54.7	36.1	158.0	23.7	55.2	14.9	196.4
Material Possession	68.1	23.7	4.4	256.1	67.8	26.4	1.1	257.3	58.2	19.8	3.5	217.7	65.3	23.4	3.0	245.7
Recognition	89.6	3.7	0.7	278.3	95.4	3.4	0.0	293.0	69.8	8.1	1.2	226.8	85.7	4.9	0.6	267.5
Employment:												202.3				
Part-time	57.0	25.9	0.7	223.5	74.7	18.4	0.0	260.9	50.0	24.4	3.5	169.6	76.6	23.4	0.00	276.6
Full-time	74.8	7.4	0.7	276.9	65.0	19.5	0		44.2	15.6	5.8	232.6	100.0	-	0.00	300.0
Improved Nutrition																
Balanced Diet	79.3	8.9	1.5	256.2	77.0	18.4	0.0	234.0	61.6	23.3	1.2	291.8	73.7	15.6	0.00	252.3
Source of raw material for:																
Garri	91.1	0.0	6.7	280.0	94.3	1.1	0.0	285.1	96.5	0.0	2.3	291.8	100.0	-	0.00	300.0
Fufu prod	59.2	4.4	33.3	219.7	77.0	1.1	20.7	253.9	87.3	0.0	9..1	271.0	100.0	-	0.00	300.0
Starch Prod	0.00	11.8	75.5	119.1	0.00	5.7	83.3	100.4	0.00	8.2	84.9	108.3	0.00	32.8	57.8	123.4
Flour Prod	9.6	15.6	61.5	121.5	6.8	13.8	72.4	120.4	7.0	5.8	66.5	99.1	8.4	-	0.00	25.2
Livestock fed	20.0	30.4	39.2	160.0	20.7	41.2	10.3	154.8	33.7	45.3	18.6	210.3	24.0	44.2	1.9	162.3
Ethanol prod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Chips	0.0	0.0	88.9	88.9	0.0	0.0	91.9	91.9	0.0	0.0	96.5	96.5	0.0	0.00	210.0	210.0
Tapioca	5.9	31.9	51.9	133.4	4.5	20.7	67.6	122.5	10.4	61.6	22.1	176.5	54.4	0.00	0.00	163.2

Source: Field survey, 2011

5.10: Level of benefits derived from cassava enterprise

Table 17 shows the distribution of entrepreneurs according to level of benefits derived from cassava enterprise. The result in table 17 indicates that a large proportion (69.2%) of entrepreneurs derived high benefits from cassava enterprise. The result further reveals that across entrepreneurs' categories, 80.7%, 65.5% and 54.7% of producers, marketers and processors respectively also derived high benefits. The high level of benefit is expected considering the high level of people's involvement in cassava enterprise. This implies that cassava enterprise will continue to thrive in the study area despite enormity of constraints the entrepreneurs are facing. The result is consistent with the finding of Ezebuiro *et al.* (2008) that cassava enterprise has enormous benefits; ensuring cash income, employment and food security all year round in most households.

Table 17: Level of benefits derived from cassava enterprise

Level	Producer N=135			Marketers N=87			Processors N=86			Overall N= 308		
	Score	F	%	score	F	%	score	F	%	Score	F	%
Low	0-58.6	21	15.6	21-59.6	18	20.7	42-54.2	32	37.2	0-57.5	71	23.0
Moderate	56.6-75.6	5	3.7	59.7-74.5	12	13.8	54.3-73.1	7	8.1	57.6-74.9	24	7.8
High	76.0-78	109	80.7	74.6-78	57	65.5	73.2-78	47	54.7	75-78	213	69.2
Mean	**67.28± 8.688**			**67.15 ± 7.423**			**63.74 ± 9.468**			**66.26 ±8.698**		

Source: Field Survey, 2011

5.11 Section 7: Entrepreneurs' constraints to cassava production

The section discusses constraints to entrepreneurs' involvement in cassava enterprise. The distribution of respondents across entrepreneurs' categories is presented in Table 18-22

5.11.1 Producers' constraints

The result in Table 18 reveals that all cassava producers had serious constraints of finance (100.0%), cost of fertilizer (100.0%) and contact with extension agents (100.0%). Also non-availability of equipment (98.5%), credit facility (97.8%), lack of technical knowledge in using improved technology (97.8%), non-availability of agro-chemicals (97.8%), instability of government policy (97.8%) and non-availability of fertilizer were other serious constraints faced by producers. Also found to be serious constraints to producers include: lack of collateral (96.5%), cost of chemicals (96.3%), cost of labour (94.8%), interest on loan (94.1 %), pest and diseases (80.0%), lack of labour (79.3%), and weed (78.3%), difficulty in harvesting (77.0%), lack of hospitals (75.6%), market (68.1%), and cost of improved cassava variety (60.7%), lack of access road (59.3 %) and erosion (49.6%). From the weighted scores, finance (200.0%), cost of inorganic fertilizer (200.0%) and poor extension agents' contact (200.0%) were ranked first among the constraints facing cassava producers. This means that both finance, cost of inorganic fertilizer and poor extension agents' contact are the most serious constraints facing this category of cassava enterprise. The result was expected as the most prevailing source of raising fund for enterprise expansion in the study area is through personal savings. It implies that the entrepreneurs may not easily venture into large scale production as well as lack the productive skill capacity to support and improve their enterprise. Non-availability of productive equipment ((198.5%) was ranked second which means that

the entrepreneurs will continue to produce using crude implement (cutlasses and hoes) that are not efficient in carrying out the activities of the enterprise and in raising its scale operation. A further ranking of the constraints to cassava producers using the weighted scores reveals that non-availability of agro chemicals (197.8%) and credit fertility (197.8%) ranked third. This means that the producers will be limited in scale of operation and output. This implies possible reduction in level of benefits derived and socio-economic status of the producers. The result is in line with Lucas (2007), FMAWR (2008), Yakasai (2010) and Ezebuiro *et al*. (2010) who listed constraints to cassava enterprise to include among others lack of capital, lack of machine, marketing problems, storage, processing, poor road network to harvest and post harvest problems.

Table 18: Distribution of cassava producers based on constraints to cassava production

	Producers n = 135							
Constraint	**Serious**		**Mild**		**Not a constraint**		**Weighted Score**	**Rank**
	F	**%**	**F**	**%**	**F**	**%**		
Finance	135	100.0	0	0.00	0	0.0	200.0	1st
Credit facilities	132	97.8	3	2.2	0	0.0	197.8	3rd
Scarcity of planting materials	66	48.9	69	51.1	0	0.0	148.9	17th
Technical knowledge for improved tech	132	97.8	2	1.5	1	0.7	197.1	4th
Land	49	36.3	26	19.3	60	44.4	91.9	22nd
Cost of improved variety	82	60.7	53	39.3	00	0.0	160.7	15th
Interest rate of loan	127	94.1	3	2.2	5	3.7	190.4	9th
Pricing of cassava products	61	45.2	28	20.7	46	34.1	111.1	20th
Collateral to secure loan	133	96.5	2	1.5	0	0.0	194.5	7th
Limited processing option	0	0.0	0	0.00	135	100.0	0.00	23rd
Weed	103	76.3	32	33.7	0	0.0	186.3	10th
pests and diseases infestation	108	80.0	27	20.0	0	0.0	180.0	11th
Cost of inorganic fertilizer	135	100.0	0	0.00	0.0	0.0	200.0	1st
Non-availability of organic fertilizer	131	97.0	4	3.0	0	0.0	197.0	5th
Non-availability agro-chemicals	132	97.8	3	2.2	0	0.0	197.8	3rd
Non-availability of Equipment	133	98.5	2	1.5	0	0.0	198.5	2nd
Cost of agro-chemicals	130	96.3	5	3.7	0	0.0	196.3	6th
Difficulties in harvesting	104	77.0	31	23.0	0.	0.0	177.0	13th
Labour	107	79.3	28	20.7	0	0.0	179.3	12th
Poor extension agents' contact	135	100.0	0	0.00	0	0.0	200.0	1st
Instability in government policy	132	97.8	3	2.2	0	0.0	197.0	5th
Marketing	92	68.1	39	28.9	4	3.0	165.1	14th
Soil erosion	67	49.6	41	30.4	27	20.0	129.6	19th
Hospitals	102	75.6	2	1.5	31	23.0	152.7	16th
Access road	80	59.3	29	21.5	26	19.3	140.1	18th
Cost of hired labour	128	94.8	2	1.5	5	3.7	191.1	8th
Cost of processing	0	0.0	0	0.00	135	100.0	0.00	23rd
Soil fertility	60	44.4	26	19.3	49	36.3	108	21st

Source: ***Field survey, 2011***

5.11.2 Constraints to marketers' involvement in cassava enterprise

Further analysis on constraints facing marketing entrepreneurs in cassava enterprise as shown in Table 19 reveals that most marketers were faced with numerous constraints. The result in table 19 indicates that the constraints include: lack of finance (100.0%), collateral (100.0%), and limited processing option (100.0%) lack of credit facility (98.9%), instability of government policy (97.8%) and inadequate contact with extension agents (97.7%). The results from the weighted scores also show finance (200.0%), collateral to secure loan (200.0%) and limited processing options (200.0%) were ranked first followed by instability in government policy (198.9%) and Technical knowledge for improved technology (198.9%) as second. This result is in line with *a priori* expectation because of the prevailing absence of effective linkages with appropriate industry, right policy framework and incentives for smooth private investment in cassava marketing sub-sector in the study area. This raises doubt in the sustainability of the enterprise. It also indicates that measures advocated to reform cassava marketing sub-sector under the Presidential Cassava Initiative have not been met. The result is synonymous with FMARD (2004) who identified lack of access to market, delayed transportation, bad conditions of rural roads to market centers, pests, cost of hired labor, low price of fresh and processed cassava, lack of collateral for credit, and inadequate fund as acute constraints bedeviling marketers of agricultural produce.

Table 19: Distribution of marketing entrepreneurs on constraints to cassava marketing

	Marketers n = 87							
Variable Description	**Serious**		**Mild**		**Not a constraint**		**Weighted score**	**Rank**
	F	**%**	**F**	**%**	**F**	**%**		
Finance	87	100.0	0	0.00	0	0.00	200.0	1st
Credit facilities	86	98.9	1	1.1	0	0.00	197.8	3rd
Scarcity of planting materials	0	0.00	0	0.00	87	100.0	0.00	15th
Technical knowledge for improved tech	0	0.00	0	0.00	87	100.0	198.9	2nd
Land/shop	56	64.4	6	6.9	25	28.7	135.7	12th
Cost of improved variety	0	0.00	0	0.00	87	100.0	0.00	15th
Interest rate on loan	76	87.4	11	12.6	0	0.00	187.4	5th
Poor pricing of cassava products	50	57.5	15	17.2	22	25.3	132.2	13th
Collateral to secure loan	87	100.0	0	0.00	0	0.00	200.0	1st
Limited processing option	87	100.0	0	0.00	0	0.00	200.0	1st
Weed	0	0.00	0	0.00	87	100.0	0.00	15th
Pest/disease infestation	71	81.6	16	18.4	0	0.00	181.6	7th
Cost of inorganic fertilizer	0	0.00	0	0.00	87	100.0	0.00	15th
Non-availability of organic fertilizer	0	0.00	0	0.00	87	100.0	0.00	15th
Non-availability agro-chemicals	0	0.00	0	0.00	87	100.0	0.00	15th
Non-availability of modern equipment	0	0.00	0	0.00	87	100.0	198.9	2nd
Cost of agro-chemicals	0	0.00	0	0.00	87	100.0	0.00	15th
Difficulties in harvesting	0	0.00	0	0.00	87	100.0	0.00	15th
Non-availability of labour	71	81.6	16	18.4	0	0.00	181.6	7th
Poor extension agents' contact	85	97.7	2	2.3	0	0.00	197.7	4th
Instability in government policy	86	98.9	1	1.1	0	0.00	198.9	2nd
Market	71	81.6	14	16.1	0	0.00	179.3	8th
Soil erosion	19	21.8	56	64.4	12	`13.8	108.0	14th
Hospitals and water	70	80.5	0	0.00	17	19.5	161.0	10th
Access road	66	75.9	5	5.7	16	18.4	157.5	11th
Cost of hired labour	81	93.1	1	1.1	5	5.7	187.3	6th
Cost of processing	68	78.2	19	21.8	0	0.00	178.2	9th
Soil fertility	0	0.00	0	0.00	87	100.0	0.00	15th

Source: ***Field survey, 2011***

5.11.3 Constraints to processors' involvement in cassava enterprise

The result on Table 20 shows that cassava processing is faced with serious constraints like: lack of finance (100.0%), non-availability of equipment (98.8%), collateral (97.7%), lack of labour (95.5%) and cost of labour (94.2%), cost of processing (93.0%), problem of pest (93.0%), instability of government policy (93.0%), credit facility (92.6%) and lack of contact with extension agents (91.9%). From the weighted scores, finance (200.0%) ranked first followed by Non-availability of modern equipment (198.8%) as the second in the ranking. This is expected considering the non diversification and proliferation of traditional cassava processing method in the study area. The result implies that most processors are not spared from the numerous constraints bedeviling other entrepreneurs in cassava enterprise. It is also an indication that processing enterprise will remain predominantly subsistent if appropriate intervention is not channeled to it. The result is in line with Saito and Spurling (1992), Nwachukwu (2000) and Oyegbami and Oboh (2010) that lack of water, unstable price, lack of technical know- how, finance, and access roads are serious constraints facing processors of agricultural products.

Table 20: Distribution of cassava processing entrepreneurs on constraints to cassava processing (Processors n =86)

Variable Description	Serious		Mild		Not a constraint		Weighted score	Rank
	F	%	F	%	F	%		
Finance	86	100.0	0	0.00	0	0.00	200.0	1st
Credit facilities	71	82.6	15	17.4	0	0.00	180.2	12th
Scarcity of planting materials	0	0.00	0	0.00	86	100.0	0.00	19th
Technical knowledge for improved tech	78	90.7	5	5.8	3	3.5	187.2	10th
Land/shop	37	43.0	19	22.1	30	34.9	108.1	18th
Cost of improved variety	0	0.00	0	0.00	86	100.0	0.00	19th
Interest rate on loan	76	88.4	7	8.1	3	3.5	184.9	11th
Poor pricing of cassava products	37	43.0	21	24.4	28	32.6	110.4	17th
Collateral to secure loan	84	97.7	2	2.3	0	0.00	197.4	3rd
Limited processing option	70	81.4	10	11.6	6	7.0	174.4	13th
Weed problem	0	0.00	0	0.00	86	100.0	0.00	19th
Pest/disease infestation	0	0.00	0	0.00	86	100.0	193.0	9th
Cost of inorganic fertilizer	0.0	0.00	0	0.00	86	100.0	0.00	19th
Non-availability of organic fertilizer	0	0.00	0	0.00	86	100.0	0.00	19th
Non-availability agro-chemicals	0	0.00	0	0.00	86	100.0	0.00	19th
Non-availability of Equipment	85	98.8	1	1.2	0	0.00	198.8	2nd
Cost of agro-chemicals	0	0.00	0	0.00	86	100.0	0.00	19th
Difficulties in harvesting	0	0.00	0	0.00	86	100.0	0.00	19th
Non-availability of labour	82	95.5	3	3.5	1	4.2	194.5	4th
Poor extension agents' contact	79	91.9	7	8.1	0	0.00	191.9	7th
Instability in government policy	80	93.0	5	5.8	1	1.2	191.8	8th
Soil erosion	24	27.9	47	54.7	15	17.4	110.5	16th
Hospitals and water	68	79.1	2	2.3	16	18.6	160.5	14th
Access road	57	66.3	18	20.9	11	12.8	153.5	15th
Cost of hired labour	81	94.2	5	5.8	0	0.00	194.2	5th
Cost of processing	80	93.0	6	7.00	0	0.00	193.0	6th
Soil fertility	0	0.00	00	0.00	86	0.00	0.00	19th

Source: ***Field survey, 2011***

5.11.4 Entrepreneurs' constraints in cassava enterprise (overall)

Findings from the study as shown in Table 21 shows that finance (100.0%) is a serious constraint to all the entrepreneurs in cassava enterprise. Also, shown to be serious constraints are: difficulty in obtaining credit facility (93.8%), scarcity of planting materials (59.1%), lack of technical knowledge in the use of improved technology (96.1%), scarcity of land (46.1%) and high cost of improved varieties (68.5%), high interest rate on loan (90.6%), poor price of cassava products (79.9%), lack of collateral to secure loan (98.7 %), limited processing option (91.9 %), problem of weed (82.1%), pest and disease infestation (84.1%), high cost of inorganic fertilizer (97.7%), non-availability of organic fertilizer (95.8 %) and non-availability of agro-chemicals (95.8%). However, the ranking of the constraints using weighted scores shows that finance (200.0%) ranks the most serious constraints (200.0%) followed by collateral to secure loan (198.7%) and lack of modern processing equipment (198.4%) as 2nd and 3rd in the ranking respectively. The result means no variation among entrepreneurs in terms of what they considered as serious constraints to their enterprises. It is also implies that the development and growth of cassava enterprise is far from being achieved in the study area. The result is in line with that of Adeyemo (2002) who reiterated that finance; collateral, prohibitive interest rate regime and uncoordinated business ideas are serious constraints to small and medium enterprise operation in Nigeria

Table 21: Distribution of entrepreneurs based on constraints to cassava enterprise (overall)

Constraints N= 308	Serious constraints		Mild constraints		Not a Constraint		Weighted score	Rank
	F	%	F	%	F	%		
Lack of finance	308	100.	0	0.00	0	0.00	200.0	1st
Credit facility	289	93.8	19	6.2	0	0.00	193.8	9th
Scarcity of planting materials	182	59.1	124	40.3	2	0.6	158.5	20th
Technical knowledge for improved tech	296	96.1	8	2.6	4	1.3	194.8	8th
Land/shop	142	46.1	51	16.6	115	37.3	108.8	25th
Cost of improved variety	211	68.5	97	31.5	0	0.00	168.5	19th
High interest rate on loan	279	90.6	21	6.8	8	2.6	188.0	12th
Poor price of cassava products	246	79.9	62	20.1	0	0.00	179.9	16th
Collateral to secure loan	304	98.7	4	1.3	0	0.00	198.7	2nd
Limited processing option	283	91.9	19	6.2	6	1.9	190.0	11th
Weed problem	253	82.1	55	17.9	0	0.00	182.1	14th
Pest and disease infestation	259	84.1	49	15.9	0	0.00	184.1	13th
High cost of inorganic fertilizer	301	97.7	7	2.3	0	0.00	197.7	4th
Non-availability of organic fertilizer	295	95.8	13	4.2	0	0.00	195.8	6th
Non-availability agro-chemicals	298	96.8	10	3.2	0	0.00	194.9	7th
Non-availability of Equipment	304	98.7	4	1.3	0	0.00	198.7	2nd
High cost of agro-chemicals	295	95.8	13	4.2	0	0.00	195.8	6th
Difficulties of harvesting during dry season	255	82.8	53	17.2	0	0.00	182.8	13th
Non-availability of labour	260	84.4	47	15.3	1	0.3	184.1	13th
Poor extension agents' contact	299	97.1	9	2.9	0	0.00	177.1	18th
Instability in government policy	298	96.8	9	2.9	1	0.3	196.5	5th
Marketing problems	232	75.3	65	21.1	11	3.6	171.7	17th
Soil erosion problem	170	55.2	84	27.3	54	17.5	137.7	23rd
Lack hospitals	240	77.9	4	1.3	64	20.8	157.1	21st
Poor access to good road	203	65.9	52	16.9	53	17.2	148.7	2nd
High cost of hired labour	290	94.2	8	2.6	10	3.2	191.0	10th
Lack of modern Processing equipment	303	98.4	5	1.6	0	0.00	198.4	3rd
High cost of processing	250	81.2	58	18.8	0	0.00	181.2	15th
Soil fertility problem	150	48.7	56	18.2	102	33.1	115.6	24th

Source: ***Field survey 2011***

5.12 Level of severity of constraints to cassava enterprise

Table 22 presents the severity of constraints to cassava enterprise. The result shows that majority (81.5%) of the entrepreneurs assessed constraints as being of high severity to the cassava enterprise. Results across entrepreneurs' categories also show that level of severity of constraints to producers (59.3%) and marketers (74.7%) was high, while processors (59.3%) had low severity level of constraints. The implication is that despite the magnitude of constraints faced by cassava entrepreneurs', they have persevered to remain in their various entrepreneurs' categories for their relative benefits. The result corroborates the study by Ironkwe *et al*. (2009) which listed lack of capital/credit, scarcity/high cost of fertilizer, lack of access road, processing equipment and market as major constraints to cassava enterprise.

Table 22: Level of severity of constraints on cassava enterprise

Severity	**Producer n = 135**			**Marketers n = 87**			**Processors n = 86**			**Overall n = 308**		
	Score	F	%	Score	F	%	score	F	%	score	F	%
Low	64-76.98	55	40.7	64 -78.8	22	25.3	64-78.7	51	59.3	64-77.7	57	18.5
High	76.99-84.0	80	59.3	78.90-84	69	74.7	78.7-84	35	40.7	77.8-84	251	81.5
Mean	**76.99± 3.07**			**78.90 ± 7.28**			**78.02 ± 4.89**			**77.81 ± 6.68**		

Source: Field Survey, 2011

5.13 Section 8: Socioeconomic status of entrepreneurs in cassava enterprise

From the findings as shown in Table 23 majority (90.3%) of all entrepreneurs in cassava enterprise had moderate SES. The result also shows that across entrepreneurs' categories; producers (92.6%), marketers (92.0%) and processors (91.9%) had moderate SES due to their involvement in cassava enterprises. The result is contrary to *a priori* expectation. The SES of marketers was expected to be higher than other entrepreneurs giving the common belief that producers and processors are often exploited in the cassava value chain. The result may be due to other livelihood activities the entrepreneurs were involved in. It also implies that entrepreneurs enjoyed equal support services that were capable of reducing the effects of the constraints and improve their production, benefits and SES on equal scale. The result is consistent with FAO (2003) that reported that the living standard of over 80% of agricultural population in Africa is on the average.

Table 23: Distribution of entrepreneurs on SES in cassava enterprise

Socio-economic class	Scores Range	F	%	Mean	s.d
Producers					
Low	110.0-153.80	10	7.4	160.99	7.18
Moderate	153.81-168.17	125	92.6		
High	168.18-176.0	0	0.00		
Marketers					
Low SES	110.0 -158.87	7	8.0	162.75	3.95
Moderate	158.88-166.7	80	92.0		
High	166.8-167.0	0	0.00		
Processors					
Low	110.0-150.88	7	8.1	159.69	8.80
Moderate	150.89-168.49	79	91.9		
High	168.50-170	0	0.00		
Overall					
Low	110.0-154.07	30	9.7	161.12	7.04
Moderate	154.08-168.16	278	90.3		
High	168.17-169.0	0	0.00		

Source: Field Survey, 2011 **s.d – standard deviation**

5.13 Section 9: Test of research hypotheses

5.13.1: Hypothesis 1

There is no significant relationship between selected socio-economic characteristics of the entrepreneurs in cassava enterprises and their socio-economic status.

5.13.1.1: Producers

The result of chi-square analysis as shown in Table 24 reveals that age (χ^2 = 15.123, p = 0.019), marital status (χ^2 = 24.590, p = 0.029), household size (χ^2 = 10.492, p = 0.005), and experience (χ^2 = 10.644, p = 0.0031) had significant and positive relationship with socio-economic status of cassava producers. The result that age had significant relationship with socio-economic status of producers was in consonance with *a priori* expectation because age is a factor that could combine with experience to boost producers' productivity, benefits and socio-economic status. The result is consistent with those of Okoye *et al*. (2008), Chikwendu *et al*. (1994), Kebede (2001) and Nwaru (2004) that age has significant effect on socio-economic status of cocoyam farmers in Anambra state and for arable crop farmers in Imo state.

Marital status was also found to have significant relationship with socio-economic status of cassava producers. The result agrees with *a priori* expectation because marital status may bring about change in the number of hands which producers could engage in the enterprise operations. The result implies that marital status is a measure of producers' socio-economic standing in the study area. The result corresponds with the finding of Okoye *et al*. (2008) that marital status creates more positive effect if household labour is devoted to agricultural enterprise and activities.

Result of Chi-square analysis further shows that household size had influence on the socio-economic status of producers. The result is in line with *a priori* expectation because large household size would mean reduce labour cost, increased productivity, benefits and change in the SES of producers. The result implies that household size is capable of creating positive effect on output that enhances the SES of producers. The result corroborates the finding of Okoye *et al*. (2008) that positive relationship exists between household size, productivity and socio-economic status as in small-holder cocoyam farms in Anambra state.

The finding that year of experience is significant in its relationship with socio-economic status of cassava producers was also expected. This can be explained by the fact that those who have reasonable years of experience as cassava producers are more technically efficient and likely to change or explore strategies that could translate into trying new ideas they have either be seen or heard from other entrepreneurs, visitors, friends and extension agents. The result also implies that the more experienced a producer is the more efficient his decision making processes and the less averse he is in risk taking to improve his productivity and socio-economic status. The result is consistent with the findings of Dagwa (2006) and Adebayo *et al*. (2007) for maize producers in Adamawa.

5.13.1.2: Marketers

The study further establishes a significant relationship between marketing experience (χ^2 = 21.366, p = 0.000) and socio-economic status of cassava marketers. The result is expected since as the number of years in business increases, so also the profitability and SES. The result establishes the importance of experience and further implies that it is a factor that leads to perfection in cassava marketing enterprise. The

result is in line with the previous study by Agwu (2009) on plantain marketers in Abia state, Nigeria.

5.13.1.3: Processors

Table 5.22 reveals that age (χ^2 = 17.657, p = 0.007), marital status (χ^2 = 15.562, p = 0.004), education (χ^2 = 43.137, p = 0.000), and experience (χ^2 = 17.058, p = 0.013) significantly and positively influence the SES of cassava processors. The result of chi-square analysis which shows a significant relationship between the age of processors and their socio-economic was expected as it is one of the major challenges to cassava processing in the study area. The result implies that low scale processing of cassava products will continue to thrive with increased rural-urban migration of youths in the study area. The result corroborates the finding of Okoruwa and Ogundele (2006) that processors age has significant relationship with their productivity and socio-economic status.

Marital status is also significant in determining the SES of processors. This is expected because marriage is a measure of a person's socio-economic position in the cultural value system of the study area. This implies additional hands which married processing entrepreneurs are likely to use in reducing labour cost and increasing benefit from their processing enterprise.

Education also had significant influence in cassava processors' SES. This was also expected and it is an indication that educated entrepreneurs are more likely to have easy access to innovations and improved tools that could enhance their productivity and SES. The result is in agreement with Nwaru (2007) who found out that education and training help to unlock the natural talents and inherent enterprising

qualities of people, enhances their abilities to understand and evaluate productive techniques leading to increased productivity and income.

The result further indicates that experience had significant relationship with processors' SES. This was expected as experienced entrepreneurs would easily adopt innovations that will boost their enterprise and SES. The finding implies that the more experienced a processor is, the more efficient he could be in developing and modifying skills that are capable of bringing turn-around in his enterprise. The result is in conformity with Okoye, Okoye, Dimelu, Asumugha, Agwu and Agbaeze (2008) who reported that the more experienced an entrepreneur is, the more efficient his decision making processes and willingness to take risks that can transcend into improved productivity and benefits.

From the above findings, it is obvious that among the variables tested; only experience is significant in influencing the SES of all entrepreneurs (producers, marketers and processors). The result revealed that sex had no significant relationship with the socio-economic status of any of entrepreneurs. This was expected because both sexes can play corresponding active roles in cassava enterprise. The result implies that SES of entrepreneurs could be high, moderate or low irrespective of their sex. The result however agrees with Okoye *et al*. (2008) and Oluwemimo (2010) who reported that members of farm household can work both as producers, marketers and processors of farm products with no difference in socio-economic gains along gender lines.

Table 24: Chi-square analysis between selected socio-economic characteristics and socio-economic status of entrepreneurs in cassava enterprise

	Producers			Marketers			Processors	
Variables	**Df**	**χ^2-value**	**P**	**Df**	**χ^2**	**P**	**Df**	**χ^2**
Age	6	15.123	0.019*	2	1.087	0.581	6	17.657
Sex	2	7.011	0.118	2	1.945	0.378	2	1.434
Marital status	2	24.590	0.029*	--	--	--	4	15.562
Household size	2	10.492	0.005*	2	0.102	0.950	4	8.632
Education	4	6.937	0.139	4	5.384	0.250	4	43.137
Experience	4	10.644	0.031*	4	21.366	0.000*	4	17.058

***Sig at 0.05 ** at 0.01**

5.13.1.4: relationship between selected socio-economic characteristics and the socio-economic status of entrepreneurs in cassava enterprise (overall)

Results in Table 25 reveal that age (χ^2 =10.734, p = .005), marital status (χ^2 =10.668, p = 0.03), household type (χ^2 =13.620, p = .009) and years of experience (χ^2= 10.683, p = .005) were significant and positively influence SES of entrepreneurs in cassava enterprise. This implies that as more of these variables were employed, the more changes occurred in SES of entrepreneurs. The result is in line with the finding of Uchechi and Ebelenna (2009) that age, marital status, education, household size and year of experience are determinants of income and social status of cassava farmers in Abia state. The reason could be the low financial and operational level of both entrepreneurs in the study area.

Table 25: Chi-square analysis between selected socio-economic characteristics and the socio-economic status of entrepreneurs in cassava enterprise (overall)

Socio-economic characteristics	Df	Chi-Square value	p-value	Decision
Age	2	10.734	.005	Significant
Sex	2	4.361	.139	Not significant
Marital status	4	10.668	0.03	Significant
Household size	4	13.620	.009	Significant
Education	4	26.869	0.000	Significant
Years of Experience	2	10.683	.005	Significant

5.13.2: Hypothesis 2

There is no significant relationship between entrepreneurs' level of involvement in cassava enterprise and their socio-economic status.

The result of PPMC analysis as presented in Table 26 shows that there was no significant relationship between entrepreneurs' level of involvement in cassava enterprise and their SES (r-0.019 P=0.019). The result also shows that across entrepreneurs' categories, there were no significant relationships between producers' (r-0.038; p=0.660) and processors' (r-0.026; p= 0.812) level of involvement in cassava enterprise and their SES. It was expected that consistency in entrepreneurs' involvement in cassava production and processing throughout the season could have significant relationship on entrepreneurs' SES. The result therefore implies that SES of producers and processors are not predicated on their level of involvement in cassava production and processing. The result is consistent with Hobbs (2000) who observed that agro-based enterprises are normal features of rural areas and potential sources of employment, but they could be critical as well in providing employment and in influencing people's wellbeing.

The result of PPMC analysis in Table 26 also reveals significant relationship between marketers' level of involvement in cassava enterprise and their SES (r=-0.243 p=0.023). The result was expected because a unit increase in level of involvement in cassava marketing reduces the probability of being poor as a cassava marketer. The result implies that marketers' SES is predicated upon how often they were involved in cassava marketing. The result corresponds with the study of Obisesan (2012) that significant relationship exists between level of involvement in cassava marketing and rural poverty among smallholder farmers in South-west, Nigeria.

Table 26: Pearson Product Moment Correlation analysis between entrepreneurs' level of involvement in cassava enterprise and their socio-economic status

Entrepreneurs	Variable	r-value	p-value	Decision
Producers	Involvement in production	0.038	0.660	NS
Marketers	involvement in marketing	-0.243	0.023	S
Processors	Involvement in processing	0.026	0.812	NS
Overall	Involvement in cassava enterprise	0.019	0.746	NS

5.13.3: Hypothesis 3

There is no significant difference in the socio-economic status of different categories of entrepreneurs' in cassava enterprise.

The result of one way ANOVA analysis on Table 27 shows that there was no significance difference in the SES of various entrepreneurs in cassava enterprise. The result is in line with *a priori* expectation due to similarity in the level of benefit and severity of constraints faced by producers, marketers and processors in the study area. This infers that the socio-economic status of entrepreneurs in cassava enterprises does not differ from one another (p=0.546). It also implies that cassava enterprises provide benefits that could make entrepreneurs' SES not significantly different from one another. The result supports the finding of Yee and Paludetto (2005) that although there is considerable variations in both operating cost and rate of return in respect of cassava production, processing and marketing, no significant difference exist in the socio-economic position of participating rural farm households in Nigeria.

Table 27: Analysis of variance on the difference in the socio-economic status of entrepreneurs in cassava enterprise

Variable		SS	Df	Mean square	F	p-value
SES	Between Groups	60.380	2	30.19	0.607	0.546

However, a Scheffe post hoc test of multiple comparisons between the entrepreneurs on Table 28 shows that SES of producers (160.99) is less than that of marketers (162.75). The result further reveals that the socio-economic status of marketer and producers were not significantly different at 0.05 level of significance. This implies that the difference accounted for in their mean socio-economic status is not sufficiently being determined by the difference they shared in cassava enterprise. Similarly, the study shows that producers ($\bar{x}$ = 160.99) had higher SES than processors ($\bar{x}$ = 159.69), though the difference is not significant at 0.05 level of significance. This also implies that the difference in their SES could not be attributed to their positions as producers or processors. Meanwhile, result shows a significant difference (at p = 0.05) between the SES of marketers ($\bar{x}$ = 162.75) and processors ($\bar{x}$ = 159.69). This implies that marketers had significantly higher SES than processors. The result is in line with *a priori* expectation because the cost of processing equipment, unreliable public power supply and alternative use of generators in the face of ever escalating fuel cost is capable of having corresponding negative effect on profitability of cassava processing as well as processor's SES.

Table 28: Post Hoc test of multiple comparison of entrepreneurs' socio-economic status

Enterpreneur	Mean	Mean difference	p	Sig.
Producer	160.99	-1.76	0.186	NS
Marketer	162.75	1.76		
Producer	160.99	1.30	0.403	NS
Processor	159.69	-0.13		
Marketer	162.75	3.06	0.016	S
Processor	159.69	-3.06		

5.13.4: Hypothesis 4

There is no significant relationship between the relative benefits entrepreneurs derive from cassava enterprise and their socio-economic status.

Pearson Product Moment Correlation analysis (PPMC) result on Table 29 reveals that a significant relationship existed between benefits derived from cassava enterprise and entrepreneurs' SES (r-0.280, p=0.000). The result also reveals a significant relationship between benefits derived from cassava enterprise and entrepreneurs' (producers r = 0.407 p = 0.000, marketers r = 0.321 p=0.002, processors r = 0.431 p=0.032) SES. The result was in line with *a priori* expectation as people's SES is often used to measure the quantum of benefits accruing from their occupations. The result implies that the more the benefits derived, the better-off the SES of entrepreneurs. The finding is in tandem with Aye *et al*. (2006) who on comparing output of various crops in Nigeria, found out that cassava enterprise ranks first in having significant influence on food and nutritional security, income generation, poverty alleviation and socio-economic status of rural farm households.

Table 29: Pearson Product Moment Correlation analysis between entrepreneurs' relative benefits from cassava enterprise and their socio-economic status

Entrepreneurs'	Variable	r-value	p-value	Decision
Producers	Benefits from production	0.407	0.000	S
Marketers	Benefits from marketing	0.321	0.002	S
Processors	Benefits from processing	0.431	0.032	S
Overall	Benefits in cassava enterprise	0.280	0.000	S

5.13.5: Hypothesis 5

There is no significant difference in the relative benefits entrepreneurs derived from cassava enterprise.

The result of analysis of variance (ANOVA) as shown on Table 30 reveals that there is no significant difference in the benefits derived by different entrepreneurs in cassava enterprise. (F=1.478, p=0.23). This is not in conformity with *a priori* expectations giving the common belief that producers and processors are often exploited by marketers and therefore do not make better profit in cassava enterprise. The result indicates that entrepreneurs in cassava enterprise have corresponding benefits. The result does not compare favourably with the findings of Mpagalile *et al.* (2008) that significant difference exists between the profit margins of cassava producers, processors and marketers.

Table 30: Analysis of variance of the relative benefits derived by entrepreneurs' in cassava enterprise

Variable		SS	Df	Mean square	F	p-value
SES	Between Groups	223.007	2	111.504	1.478	0.23

The result of a Scheffe post hoc test of multiple comparisons between the entrepreneurs as shown on Table 31 reveals that benefits derived from cassava enterprise by producers ($\bar{x}$ = 67.28) is greater than that of marketers ($\bar{x}$ = 65.15). The result further shows that marketers' and producers' benefits were not significantly different at 0.05 level of significance. This implies that the difference in their enterprise categories is not sufficient enough to account for a significant difference in the level of benefits which each derived. The result further indicates that the producers and marketers may have encountered similar level of access to intervention input and severity of constraints. However, the study shows that producers ($\bar{x}$ = 67.28), had significantly higher level of benefits than processors ($\bar{x}$ = 63.74). This implies therefore that the difference in their level of benefits is a function of the differences in their enterprise categories, as producers and processors. Similarly, marketers ($\bar{x}$ = 67.15) and processors ($\bar{x}$ = 63.73) show significant difference between each others' derived benefits at 0.05 level of significance. This implies that marketers obtained higher level of benefits from cassava enterprise than processors. This is possible as marketers could buy at lower rate, hoard and market at higher price later. This makes the marketers derive more benefit than producers. Processors are also expected to derive more benefit than producers. Producers thus need to be empowered to be able to go through the value chain.

Table 31: Post Hoc test of multiple comparisons of entrepreneurs' relative benefits from cassava enterprise

Entrepreneurs	Mean	Mean difference	p	Sig.
Producer	67.28	0.13	0.994	Not significant
Marketer	67.15	-0.13		
Producer	67.28	3.54	0.012	Significant
Processor	63.74	-3.54		
Marketer	67.15	3.41	0.035	Significant
Processor	63.74	-3.41		

5.13.6: Hypothesis 6

There is significant relationship between entrepreneurs' access to intervention programmes in cassava enterprise and their socio-economic status

The result of PPMC analysis on Table 32 shows that there was a significant correlation between entrepreneurs' access to intervention programmes in cassava enterprise and their socio-economic status (r-0.198, p = 0.000).

Across entrepreneurs' categories, Table 32 also reveals that there was no significant correlation between producers' (r = 0.075 p = 0.386), processors' (r = 0.188 p = 0.084) and marketers' (r = 0.238 p = 0.451) access to intervention programmes and their SES. This was not expected as access to intervention packages should have improved their productivity and benefits which could as well necessitate improved SES of the entrepreneurs. The result implies that producers, processors and marketers may have relied on other unofficial options to sustain and thrive successfully in cassava enterprise. The result is in line with Adebayo and Salawu (2007) who found out that cassava producer, processors and marketers were aware of the presidential initiative on cassava but indifferent about its effects on their activities. The result is as well contrary to the finding Nweke (1994, 1996) who reported that with the introduction and adoption of mechanized cassava grater technology, benefits from cassava enterprise in Africa has increased significantly.

Table 32: Relationship between entrepreneurs' access to intervention programmes in cassava enterprise and their socio-economic status

Entrepreneurs' access to intervention	r-value	p-value	Decision
Producers	0.075	0.386	Not significant
Marketers	0.238	0.451	Not Significant
Processors	0.188	0.084	Not significant
Overall	0.198	0.000	Significant

5.13.7: Hypothesis 7

There is no significant contribution of selected independent variables to the socio-economic status of categories of entrepreneurs in south eastern Nigeria.

From the regression analysis result in Table 33, household size (β = 15.081, p = 0.000), benefit derived (β = 3.241, p = 0.000), income (β = 3.103; p = 0.045), farm size (β = 3.251, p = 0.021), experience (β = 2.638, p = 0.046), constraints to cassava production and (β = -1.918, p = 0.048) had significant contributions to cassava producers' SES. The result means that any change in any of these factors could result in a change in SES of cassava producers. The study further identified household size (β =15.081, p = 0.000), and benefits derived (β = 3.247, 0.000) as the most important determinants of cassava producers' socio-economic status in the study area with p-values of 0.000.

The significant contribution of household size to producers' SES was expected because the high rate of rural-urban migration in search of paid employment or *okada* riding, results in cases of farm labours shortages in the study area; such that large households become boost for improved production, easing labour bottlenecks and improving benefits. The result implies that a unit increase in household size will bring about change in producers' SES. This supports the finding of Nnadi and Akwiwu (2006) that large farm families are predisposed to adoption of innovations that enhanced their productivity and living standard.

The significant contribution of benefits derived is in conformity with *a priori* expectation as benefit realized is usually ploughed back into the family to guarantee family sustainability and welfare through provision of food, paying children's school fees, changing children's cloth, building of houses, acquiring titles and leisure. The result implies that any change in benefit derived from cassava production could have

appreciable change in SES of producers. The result is in conformity with the finding of Aiyedun, *et al*. (2008) that enhanced benefit from farm enterprises goes a long way in empowering an entrepreneur to play both economic and social roles which may have a far-reaching multiplier effect in the areas of decision-making, raising funds and self-respect.

The relationship between annual income and producers' socio-economic status was expected considering the prominent socio-economic role of money in the society. The result implies that cassava producers could still remain in the enterprise despite challenges. The result is consistent with that of Mathew-Njoku (2003) that income is one of the most important factors that influence farmers' acceptance of new ideas and socio-economic status.

Farm size was found to have significant contribution to the SES of cassava producers in the study area. This conforms to *a priori* expectations as entrepreneurs with large farm size are more likely to have improved SES when compared with those that are constrained by land availability. Elasticity of production suggests that if fame size is increased, output will increase as well as living standard *ceteris paribus*. Oluyole and Sanusi (2009) had similar findings on a study carried out in Cross River State, reporting that with the desired agronomic/management practices, increased farm size will improve farm output and living standard of farm households.

The significant contribution of years of experience in cassava production was also expected because experience furnishes more knowledge that could increase farmers' rationality in the use of innovations to increase output and SES. The implication is that experienced cassava producers can interpret information properly, understand demonstrations clearly and would be ready to implement new agricultural knowledge. The work of Nnadi and Amaechi (2007) explained increased years of

farming experience as a valuable asset in adoption decision-making that can improve farmers' productivity and benefits and socio-economic status.

The regression analysis result further revealed that constraints have significant relationship with the SES of the producers. This was expected given the enormity of constraints facing cassava producers in the study area. The result connotes that constraints might create a positive effect on producers' output, benefits and SES or retains the status quo. The result confirms the finding of Knights, *et al.* (2003) that constraint is a determinant factor to level of productivity and returns from micro-business and agro-based enterprises.

Table 33 also reveals that benefits derived ($\beta = 1.602$, $p = 0.002$), constraints ($\beta = -1.836$, $p = 0.002$) and income ($\beta = 2.143$, $p = 0.047$) were the most important determinants of marketers' SES. This result infers that the higher the benefits derived, the higher the SES of marketers. This was expected as the quantum of benefit derived often determines the volume and quantity of cassava products traded and thus expansion of enterprise which also is a measure of improved SES. This result is consistent with those of Agwu (2009) and Eze (2006) on determinants of profitability among plantain marketers in Abia State and socio-economic determinants of output and profit levels of small holders rice production systems in Abia State, Nigeria respectively.

However, an indirect relationship existed between marketers' extent of constraints and their SES. The result was in line with *a priori* expectation considering the enormity of constraints facing cassava marketers and their living standard in the study area. This implies that marketers, who faced myriads of constraints, had their SES significantly limited. The result is in consonant with Gwary and Bawa (2008)

who found out that both scale of operation, benefits and constraints determine living standard of rural youth engaged in agricultural enterprise.

Table 33 also reveals that source of benefits derived (β = 7.075, p = 0.038), income (β = 3.120, p = 0.037) and experience (β = 1.760, p = 0.040) are the top predictors of processors' SES. This implies that SES of processors to a large extent is determined by benefits derived, income and experience.

The result on benefits derived was expected also in view of the fact that most commercially inclined farmers who make reasonable gains are less likely to be poor than farmers whose sole purpose of farming is subsistence. This implies that as benefits from cassava processing increases so also is the SES likely to improve. The result is consistent with the finding of FAO (2005) that the low level benefits from farm enterprise is a reason for the poor living standard of rural farm household in Nigeria.

The result on experience was also in line with *a priori* expectation as experience has been known to lead to perfection in activities. This implies that the more experienced a processor is, the more the likelihood of improved SES. The result is in line with a previous result obtained by Agwu (2009) which stated that years of experience led to an increase in the quantity of maize processed as well as improved processors' techniques and living standard.

Table 33: Coefficient of regression showing the contributions of the dependent variables to entrepreneurs' socio-economic status in South eastern Nigeria

Variables	Producers		Marketers		Processors	
	β	T	β	T	β	t
Constant	137.210	14.788	157.077	12.298	158.829	7.190
Age	0.146	0193	0.753	0.712	0.617	0.300
Household size	15.081*	6.633	-1.137-	0.344	0.286	0.077
Household type	-4.011	-2.352	1.328	0.677	1.760	0.526
Experience	2.638*	4.134	-1.178	-1.113	5.365*	2.095
Involvement level	-0.034	-0.077	0.220	0.373	-1.352	-1.010
Income	3.103*	3.342	2.143	4.563	3.120*	4.345
Access to intervention	-0.375	-0.708	0.192	0.429	2.287	1.523
Benefits derived	3.247*	6.288	1.608*	3.279	7.075*	5.867
Constraints	-1.024*	-1.918	-1.836*	-3.248	-1.431	-1.208
Farm size	3.251*	5.471	-	-	-	-
Other crops planted	-0.033	-0.087	0.311	0.527	-0.985	-0.816
Source of labour	0.956	1.117	0.371	0.292	-4.198	-1.223
Source of capital	-0.881	-1.333	-0.412	-0.463	1.797	0.798
Variety planted	1.031	0.370	-2.561	-1.183	4.350	0.681
Transportation	-0.508	-1.442	-.710	-1.441	-1.571	-1.663
Education	-0.047	-0.608	-0.724	-1.021	-0.409	-0.225

Significant at 0.01 * Significant at 0.05

From the regression coefficient result on Table 34 shows that the R-square value of 0.811, 0.501 and 0.38 implies therefore that all the considered variables contributed 81.1%, 50.1% and 38.0% variance to socio-economic status (SES) of producers (F = 23.140, p =0.000), marketers (F = 3.763, p = 009) and processors (F = 2.201, p = 0.010) respectively.

Table: 34 Regression coefficients for socio-economic status of entrepreneurs' in cassava enterprise

Entrepreneurs'	Model	Sum of Squares	Df	Regression Error	Mean square	F	Sig
Producers	Regression	5599.807	21	3.395	266.657	23.140	0.000
Marketers	Regression	672.110	18	3.140	37.339	3.768	0.009
Processors	Regression	2552.604	19	7.812	134.348	2.201	0.010

Producer: R = 0.901, R^2 = 0.811; Marketer: R = 0.708, R^2= 0.501; Processor: R=0.62, R^2 = 0.38

CHAPTER SIX

6.0 SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents a highlight of the summary of major findings of the research. It draws conclusions from the findings and makes recommendations. Areas of further research are suggested on issues arising from the study.

6.1 Summary

Cassava has played and continues to play a remarkable role on the agric-business stage of Nigeria. Since its introduction into Nigeria, cassava has moved from a minor crop status to a major crop that accounts for reasonable amount of calories consumed in most parts of Nigeria. It constitutes a major item in the crop combination of most farmers and contributes significantly to total farm income in Nigeria. The profitability of the crop therefore has been a major focus for various intervention programmes in Nigeria.

It is reported that despite the intervention programmes, the sub-sector has remained predominantly at subsistence level. Similarly, Nigeria is reportedly to be the world's largest producer of cassava with estimated 36.8 million metric tons on a total harvested area of 3.13 million ha, yet studies have revealed that most of Nigeria's population is chronically hungry and economically back-ward. It is expected therefore that Nigeria's level of production will be a boost to socio-economic status of those involved in the nation's cassava enterprise. On the contrary, research has further shown that the SES of those involved is not significantly improving in Nigeria. There

should supposedly be a correlation between production levels attained and change in the SES of those involved in the cassava enterprise.

The issues that revolve around scale of operation, level of involvement and SES of entrepreneurs in cassava enterprise was critically assessed to bring out the explanatory factors for attained production level and SES of those involved in south eastern Nigeria.

The issue of who among the entrepreneurs have higher SES in cassava enterprise was ascertained. Such information gap is a reason why appropriate packaging, channeling and distribution of incentives are difficult in the study area. On the other hand, whereas; government and non-governmental interventions in cassava enterprise are typically cited in literature as means of encouraging involvement in cassava enterprise, entrepreneurs' access to those interventions are rarely mentioned. It is obvious that access to intervention is important to necessitating substantial benefits from cassava enterprises and improved SES of entrepreneurs. Evidence also suggests that agro-enterprises generally are bedeviled by numerous constraints. Therefore, effort at determining specifically those of cassava enterprise is germane and a step in proffering solutions to improving entrepreneurs' productivity, benefits and socio-economic status. It is therefore against this background that this study attempted to determine the contributions of cassava enterprise to entrepreneurs' socio-economic status in south eastern Nigeria.

Specifically, the study:

1. examined entrepreneurs' level of involvement in cassava enterprise in the study area.
2. determined entrepreneurs' access to intervention programme input for cassava enterprise in the study area.

3. identified constraints to cassava enterprise in the study area.
4. determined the relative benefits entrepreneurs derive from their involvement in the cassava enterprise.
5. ascertained the different socio-economic status of entrepreneurs in cassava enterprise in the study area.

Multistage sampling procedure was used to select respondents for the study. Imo and Anambra states were selected purposively from five south eastern states of Nigeria due to high involvement in CE. Systematic sampling procedure was used to randomly select 20% of registered cassava producers (81, 54), processors (51, 36) and marketers (50, 36) groups from Imo and Anambra states respectively resulting in 308 entrepreneurs. Interview schedule was used to collect data on respondents' socio-economic characteristics, enterprise characteristics, level of involvement in cassava enterprise, access to intervention programme, benefits derived and constraints to involvement in cassava enterprise. Data collected were analyzed using both descriptive and inferential statistics such as frequencies, percentages, Chi-square, PPMC, ANOVA and regression. The hypotheses were tested at 0.05 probability level.

6.2 Major findings

The entrepreneurs (54.2%) had a mean age of 56 years. Across entrepreneurs' categories, results revealed that most producers (54.8 %), marketers (71.3 %) were within the same age range of 56-65 years and most processors (71.3 %) were in the age range of 45-55 years. Results from the study reveal that high percentages of producers (71.9%), marketers (65.5%) and processors (61.6%) completed secondary school education.

Similarly, most of the producers (78.8%), marketers (71.3%) and processors (89.5%) were female. It was also discovered that while 91.9%, 100.0% and 97.7% of producers, marketers and processors respectively were married; majority of the producers (97.85), marketers (98.9%) and processors (96.5%) had household size of above 8.

Most producers (80.7%), marketers (75.9%) and processors (84.9%) had between 25-50 years of experience while annual mean income for most producers (36.8%), processors (46.5%) and marketers (57.5%) was between ₦200, 001to ₦ 300,000. Source of finance was found to be mainly from personal savings for most producers (92.2%), marketers (87.4%) and processors (100.0%).

Chi-square analysis across entrepreneurs' categories revealed that age (χ^2 =10.734, p = .005), marital status (χ^2 =10.668, p = 0.03), household type (χ^2 =13.620, p = .009) and years of experience (χ^2= 10.683, p = .005) were significant and positively influenced SES of producers, marketers and processors in cassava enterprise.

A large proportion of producers (91.1%), marketers (58.6%) and processors (96.5%) were highly involved in their respective cassava enterprise. The result of PPMC analysis shows that there was no significant relationship between producers' (r-0.038; p=0.660) and processors' (r-0.026; p= 0.812) level of involvement in cassava enterprise and their SES. However, significant relationship existed between marketers' SES and their level of involvement in cassava marketing (r =-0.243, p = 0.023).

Majority of the producers (92.6%), marketers (92.0%) and processors (91.9%) had moderate SES. There was no significant difference in the SES of various entrepreneurs (p=0.546) in cassava enterprise.

Most producers (80.7%), marketers (65.5%) and marketers (54.7%) derived high benefits from their respective cassava enterprise. A significant relationship existed between benefits derived by producers (r = 0.407, p = 0.000), marketers (r = 0.321, p=0.002) and processors (r = 0.431, p=0.032) and their SES. In addition, there was no significant difference in the benefits derived by different entrepreneurs in cassava enterprise (F=1.478, p=0.23). Scheffe post hoc test of multiple comparisons between the entrepreneurs further revealed that though benefits derived from cassava enterprise by producers ($\bar{x}$ = 67.28) was greater than that of marketers ($\bar{x}$ = 65.15) they were not significantly different at 0.05 level of significance. Also the result shows that producers ($\bar{x}$ = 67.28), had significantly higher level of benefits than processors ($\bar{x}$ = 63.74). This implies therefore that the difference in their level of benefits is a function of the differences in their enterprise categories, as producers and processors. Similarly, it was found that marketers ($\bar{x}$ = 67.15) and processors ($\bar{x}$ = 63.73) show significant difference between each others' derived benefits at 0.05 level of significance.

There were available intervention programmes with a large proportion of producers (60.0%), marketers (87.4%) and processors (67.4%) having high access to them. There was no significant relationship between producers' (r = 0.075, p = 0.386), processors' (r = 0.188, P = 0.084) access to intervention programmes and their SES while a significant relationship was recorded between marketers' access to intervention programmes and their SES (r = 0.238 p = 0.451).

Regression analysis on the contributions of the independent variables to socio-economic status of cassava entrepreneurs showed that benefits derived (β = 3.241, p = 0.000), income (β = 3.103; p = 0.045), farm size (β = 3.251, p = 0.021), experience (β = 2.638, p = 0.046) and constraints to cassava production (β = -1.918, p = 0.048) had

significant contributions to cassava producers' SES. Benefits derived (β = 1.602, p = 0.002), constraints (β = 3.881, p = 0.044) and income (β = 2.143, p = 0.047) were the most important determinants of marketers' SES. On the other hand, benefits derived (β = 7.075, p = 0.038), benefits derived (β = 7.075, p = 0.038) income (β = 3.120, p = 0.037) and experience (β = 1.760, p = 0.040) were top predictors of processors' SES.

6.3 Conclusion

The study investigated the contributions of cassava enterprise to socio-economic status of entrepreneurs in south eastern Nigeria. The following conclusions are therefore reached on the basis of the findings of the study:

Cassava enterprise has high level of benefits despite its numerous constraints. Access to intervention programmes among categories of entrepreneur in the study is high with their socio-economic status being moderate.

The entrepreneurs are not energetic and active enough to perform tasks in cassava enterprise based on the mean age of above 50 years. This certainly could be the reason for their low scale of operation in addition to myriads of constraints associated with cassava enterprise.

The critical determinants of producers' socio-economic status were household size, benefit derived from the enterprise, income, experience and constraints. Similarly, whereas benefits and constraints were the most important determinants of marketers' SES, benefits derived, income and experience were top predictors of processors' SES. These need to be explored in an effort to improving the socio-economic status of the entrepreneurs. This will assist farmers maximize their operational scale and benefits from cassava enterprises.

6.4 Recommendations

Based on the conclusion, the following recommendations are made towards improving the contributions of cassava enterprise to socio-economic status of entrepreneurs in South eastern, Nigeria.

1. It is crucial to evolve a structure that would involve all the actors in the determination of priorities and intervention programmes for cassava enterprise. This should be done within a formidable framework that will ensure availability, suitability, accessibility and sustainability of the interventions as well as encourage entrepreneurs to improve upon their scale of operation for enhanced benefits and socio-economic status.
2. Effort should be made by Government and Non-governmental organizations to motivate young entrepreneurs who are more agile to be involved in cassava enterprise. This could be through waiver on collateral for credit, reduction in price and easy access to fertilizer, provision of rural infrastructure/amenities, processing equipment and good and functional market system for disposal of products and income generation. Radio and television jingles, cassava enterprise seminars and workshops at ward, local government areas, state and national levels are promotional strategies that should be used aggressively by government and NGOs to also motivate young entrepreneurs into getting involved in cassava enterprise.
3. Research institutions and change agents should as well double their efforts in reaching entrepreneurs with relevant productive information and innovations that could boost awareness, scale of operation, benefits and socio-economic status of those involved in cassava enterprise.

4. Formation of formidable cooperative societies should be encouraged among entrepreneurs to help them pull their resources together for bulk purchase of inputs and better services from change agent to boost their income from the enterprise.
5. Rural infrastructure should be improved to enable entrepreneurs venture into more advanced approach in production, processing and marketing. These include stable electricity, adequate water, and means of transport, rural micro-finance banking, erosion control and market. This is with a view to mitigating the constraints that currently hamper cassava enterprise as identified by the study.

6.5 Areas of further research

The study focused on contributions of cassava enterprise to socio-economic status of entrepreneurs in south eastern, Nigeria. It is obvious that the determination of socio-economic status of entrepreneurs in cassava enterprise will encourage more people to get involved.

- While the study focused on contributions of cassava enterprise to socio-economic status of entrepreneurs in south eastern Nigeria, the research could be a subject for further exploration in other cassava producing zones of Nigeria.
- Studies on increasing income generating abilities of entrepreneurs in cassava enterprise need to be conducted. Such findings will help in reducing the associated constraints and improve the socio-economic status of entrepreneurs.
- The study revealed that the entrepreneurs are aged. It is therefore germane that the perception of the youth on the contributions of cassava enterprise be determined.

- It is also crucial to find out the role of private sector in providing intervention inputs in the cassava enterprise.

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APPENDIX 1

University of Ibadan

Department of Agricultural Extension and Rural Development

Faculty of Agriculture and Forestry

Dear respondents,

I am a postgraduate student from the University of Ibadan conducting a research on the contributions of cassava enterprise to the socio-economic status of entrepreneurs in South- eastern Nigeria. Your assistant in providing answers to the following questions will be appreciated. It is important however, to note that whatever information provided will be used purely for academic purpose as well as treated with utmost confidence. Thank you.

Please kindly tick [/] or state the appropriate response in the spaces provided.

State……LGA……..Community……Reg. no……

Section A: Selected personal characteristics

1. Age in years……
2. Sex : Male [ ] Female [ ]
3. Marital Status: (a) single [ ] (b) married [ ] (c) divorced [ ] (d)widowed [ ](e)widower[ ]
4. How many male children do you have?……
5. How many female children do you have?……
6. Educational attainment: (a) No formal education [ ] (b) Primary education [ ] (d) Secondary education [ ] (e) Post Secondary education[ ]
7. Household type: (a) Female headed [ ] (b) male headed [ ].
8. How long have you been involved in cassava enterprise?…….

Section B: Enterprise characteristics

9. What is your per annum total income from cassava enterprise
10. In which of the following type of cassava enterprise are you involved? (a) Production (b) processing (c) marketing
11. Which of these marketing outlets do you use (a) Farm gate (b) Middle men (c) Government agency
12. How many moulds do you have in your farm?.....
13. How did you acquire the land for cassava enterprise (a) Personal [ ] (b) rented/leased [ ] (c) family land [ ] (d) communal ownership [ ] (e) outright purchase [ ] (f) government land [ ].
14. Which other crops do you usually cultivated/marketed/processed with cassava (a) maize [ ] (b) yam [ ] (c) vegetables [ ] (d) others (specify)……
15. Which of these options is your source of labour (a) family members [ ] (b) paid labour [ ] (c) friends [ ] (d) Association members [ ] (e) self [ ].
16. Which of these options is your source(s) of fund (a) Own savings[ ] (b) Credit [ ] (c) Inheritance [ ] (d) Gifts/donations from family/friends [ ]
17. Which of these cassava varieties do you plant: (a) Improved variety [ ] (b) Local variety [ ] (c) Both varieties [ ].
18. What is your means of transporting cassava (a) Trailer [ ] (b) Truck [ ] (c) Motorcycle [ ] (e) Head porterage [ ] (e) Pick up van [ ] (f) boat [ ] (g) bicycle [ ]
19. What is your total income per annum from cassava enterprise?

Section C: Entrepreneurs' level of involvement in cassava enterprise

20. What is your level of involvement in the cassava enterprise?

Entrepreneurs' level of involvement in cassava enterprise	**Always (2)**	**Occasionally (1)**	**Not at all (0)**
Producer:			
a) Produces stem cuttings			
b) Fresh stem tubers			
Processor:			
a) Processing fresh roots into flour			
b) Processing fresh tuber into chips			
c) Processing fresh roots into starch			
e) Processing fresh roots into *garri*			
f) Processing fresh roots into tapioca			
g) Processing fresh roots into *fufu*			
Marketer:			
a) Marketing fresh tubers			
b) Marketing cassava chips			
c) Marketing cassava flour			
d) Marketing cassava starch			
e) Marketing stem cuttings			
f) Marketing *garri*			
g) Marketing tapioca			

Section D: Entrepreneurs' scale of operation in cassava enterprises

21. Which of the following is your scale of operation in cassava enterprise?

Type of cassava Enterprise	**Tick if involved (/)**	**Scale of Operation**			
		Small scale	**Medium scale**	**Large scale**	**Quantity produced/processed/marketed**
Producer:					
a).Producing fresh tubers					
b) Producing stem cuttings					
Processor:					
a) Processing flour					
b) Processing fresh tuber into chips					
c) Processing fresh roots into starch					
e) Processing fresh roots into *garri*					
f) Processing fresh roots into tapioca					
g) Processing fresh roots into *fufu*					
Marketer:					
a) Marketing fresh tubers					
b) Marketing cassava chips					
c) Marketing cassava flour					
d) Marketing cassava starch					
e) Marketing stem cuttings					
f) Marketing *garri*					
g) Marketing tapioca					

Section E: Intervention programmes in Cassava enterprise

22. Which of these intervention programmes are available for cassava entrepreneurs

	Interventions	**Agencies**						
		ADP	**Fadama**	**USAID**	**NDDC**	**Rel. organ**	**NRCRI**	**Oil. comp**
	Improved cuttings							
	Marketing outlets							
	Agro-chemicals							
	Land/shop							
	Capital							
	Labour							
	Machinery							
	Extension service							
	Provision of market							
	workshop/training							
	Processing equipment							
	Est. proc. centers							
	Const of road							

23. Please tick the rate at which you have access to the following intervention inputs

S/No	Input	Always (2)	Occasionally (1)	Not at all (0)
1	Improved cuttings			
2	Marketing outlets			
3	Agro-chemicals			
4	Land/shop			
5	Capital			
6	Labour			
7	Machinery			
8	Extension service			
9	Provision of market			
10	Workshop/training			
11	Processing equipment			
12	Establishment of processing. Centers			
13	Construction of road			

Section F: Benefits derived from cassava enterprise

24. Benefits you derive from cassava enterprise and the level at which each benefit was derived. (Tick as appropriate)

S/No	Benefits		Very high	High	Moderate	low	Very low
			1	2	3	4	5
1	Food security: during:	a) Dry season					
		b) Rainy season					
		c) All season					
		d) Famine					
		e) Crop failure					
2	Collateral for credit from:	a) Government					
		b) Friends					
		c) Association					
		d) Banks					
		e) Family					
		f) Friends					
3	Improved socio-economic status in the form of:	a) income					
		c) Chieftaincy titles					
		d) Material possessions					
		e) Recognition in the community					
4	Employment:	a) Part-time employment					
		b) Full-time employment					
5	Improved nutrition:	Balanced diet					
6	Source of raw material for:	a) *garri* production					
		b) *Fufu* production					
		c) Starch production					
		d) Flour production					
		e) Livestock feeds					
		f) Ethanol production					
		g) Chips production					

Section G: Constraints to cassava enterprise

25. Please tick appropriately the rate at which the following are constraints to your involvement in cassava enterprise

Variable Description	Serious	Mild	Not a constraint
Lack of finance			
Credit facility			
Scarcity of planting materials			
Technical knowledge for improved tech			
Land/shop			
Cost of improved variety			
Interest rate on loan			
Poor pricing of cassava products			
Collateral to secure loan			
Limited processing option			
Weeds			
Pest/disease infestation			
Cost of inorganic fertilizer			
Non-availability of organic fertilizer			
Non-availability agro-chemicals			
Non-availability of Equipment			
Cost of agro-chemicals			
Difficulties in harvesting during dry season			
Labour			
Poor extension agents' contact			
Instability in government policy			
Marketing problems			
Soil erosion			
Lack of hospitals			
Access to good road			
Cost of hired labour			
Processing equipment			
High cost of processing			

Section H: Socio-economic status of the entrepreneurs in the cassava enterprise

26. Please check the items in the table and tick (/) the ones you possess as a result of your involvement in cassava enterprise

S/No	Description of items	Tick (/)
1	number of wives	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
2	Number of children	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
3	Number of children in Tertiary institution	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
4	Children in the primary school	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
5	Number of children in the secondary school	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
6	Number of relatives trained in secondary school	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
7	Number of cutlasses	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
8	Number of cutlasses	None [ ]; 1 [ ]; 2-4 [ ]; above 4 [ ]
9	Pit/water toilet	No [ ]; Yes [ ]
10	Necklace	No [ ]; Yes [ ]
11	Plot of land in the village	No [ ]; Yes [ ]
12	Motorcycle	No [ ]; Yes [ ]
13	Hired labour	No [ ]; Yes [ ]
14	Video CD	No [ ]; Yes [ ]
15	Television set	No [ ]; Yes [ ]
16	Ceiling/table fans	No [ ]; Yes [ ]
117	Executive chairs	No [ ]; Yes [ ]
18	Stove	No [ ]; Yes [ ]
19	Radio/cassette players	No [ ]; Yes [ ]
20	Floor carpet	No [ ]; Yes [ ]
21	Wall clock	No [ ]; Yes [ ]
22	Wardrobe	No [ ]; Yes [ ]
23	Umbrella	No [ ]; Yes [ ]
24	Torch light	No [ ]; Yes [ ]
25	Personal generator	No [ ]; Yes [ ]
26	Wheel barrow	No [ ]; Yes [ ]

27	Standing mirror	No [ ]; Yes [ ]
28	Dining table	No [ ]; Yes [ ]
29	Curtained parlour	No [ ]; Yes [ ]
30	Metal buckets	No [ ]; Yes [ ]
31	Plastic buckets	No [ ]; Yes [ ]
32	Tumblers	No [ ]; Yes [ ]
33	Frying pan	No [ ]; Yes [ ]
34	Kettle	No [ ]; Yes [ ]
35	Bicycle	No [ ]; Yes [ ]
36	Electric/coal iron	No [ ]; Yes [ ]
37	Metal spoons	No [ ]; Yes [ ]
38	Flasks	No [ ]; Yes [ ]
39	Quality suitcase/traveling bags	No [ ]; Yes [ ]
40	Hurricane lantern	No [ ]; Yes [ ]
41	Membership of social clubs	No [ ]; Yes [ ]
86	Rain coat	No [ ]; Yes [ ]
42	Financial participation in developmental project	No [ ]; Yes [ ]
43	Mobile phone	No [ ]; Yes [ ]

Appendix 2

State	No. of LGA	No.of communities per LGA selected	Sampled communities (20%)	No. of producers in each communities	Sampled Producers from each communities (20%)	No. of marketers obtained	20% of marketers sampled	Total no of registered processors	Registered Processors sampled (20%)	Total no Entrepreneurs
Imo State	27	Oguta LGA:	Akabor	15	3	9	2	9	2	7
	15		Awa,	14	3	9	2	9	2	7
			Obudi	16	3	11	2	11	2	7
		Ohaji/Egbema LGA:	Ohaji/Egbema							
		17	Obitti,	13	3	11	2	11	2	7
			Umuagwo,	15	3	10	2	11	2	7
			Obiakpu	17	3	9	2	10	2	7
		Oru-East LGA:	Ezi-Awo 1,	15	3	9	2	10	2	7
		16	Ofekata 1,	15	3	12	2	10	2	7
			Akata	15	3	10	2	10	2	7
		Orlu LGA:	Umuzike,	13	3	11	2	9	2	7
		15	Umutanze,	16	3	11	2	10	2	7
			Umudioka	16	3	10	2	11	2	7
		Ikeduru LGA:	Akabo,	15	**3**	10	2	11	2	7
		15	Inyishi,	14	**3**	11	2	11	2	7
			Atta	16	**3**	9	2	10	2	7
			Ihebinowerre,	14	3	9	2	9	2	7
		Njaba LGA:	Okwudor,	15	3	10	2	9	2	7
		14	Umuaka	16	3	10	2	10	2	7
		Ehime Mbano LGA:	Umuneke,	16	3	10	2	9	2	7
		15	Osuama, Anara	15	3	9	2	9	2	7
				14	3	10	2	10	2	7
		Aboh Mbaise LGA:	Ibeku,	13	3	9	2	11	2	7
		15	Nguru,	15	3	10	2	10	2	7
			Ngor Okala	17	3	9	2	11	2	7
		Okigwe LGA:	Umulolo,	15	3	9	2	9	2	7
		16	Ubahu,	15	3	9	2	11	2	7
			Umunachi	15	3	9	2	11	2	7
Total used				**405**	**81**	**265**	**54(51)**	**272**	**54 (50)**	189 (182)
Anambra	21	Idemili South LGA:	Eziowelle,	14	3	9	2	9	2	7
	14		Abatete,	14	3	9	2	9	2	7
			Ogidi	15	3	11	2	10	2	7
		Ekwusiogo LGA:	Oraifite,	15	3	10	2	10	2	7
			Ihembosi,	16	3	10	2	10	2	7
			Ozubulu	16	3	10	2	10	2	7
	3	Awka South LGA:	Amawbia,	16	3	11	2	10	2	7
			Ezinato,	15	3	10	2	10	2	7
			Umuawulu	14	3	11	2	10	2	7
	4	Nnewi South LGA:	Ezinifite,	14	3	10	2	9	2	7
	15		Ekwulumili,	14	3	10	2	9	2	7
			Osumenyi	17	3	10	2	12	2	7
	5	Njikoka LGA:	Nimo,	15	3	10	2	10	2	7
	14		Abagana,	15	3	10	2	11	2	7
			Abagana	15	3	10	2	11	2	7
	6	Ihiala LGA:	Orsumoghu, Ubululsuzor,	17	3	11	2	11	2	7
	15		Uli	16	3	10	2	9	2	7
				17	3	10	2	9	2	7
			Total sampled/used	**275**	**54**	**182**	**36**	**179**	**36**	**126**
			Grand total							**308**