ECONOMIC ANALYSIS OF THE PROCESSING OF RICE AND CASSAVA IN IREPODUN/IFELODUN AND IKOLE LOCAL GOVERNMENT AREAS OF EKITI STATE, NIGERIA.

BY

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AEE/11/0001

A PROJECT WORK SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
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DECLARATION

I, ADEBISI BOSEDE RACHEAL hereby declare that this project **"economic Analysis of the processing of Rice and Cassava in Irepodun/Ifelodun and Ikole Local Government Areas of Ekiti State, Nigeria"** has been written by e and that it is a record of my own research work. It has not been presented before in any previous application of a degree or any reputable presentation elsewhere. All borrowed idea have been duly acknowledge.

Adebisi Bosede R.

30/11/2017

Date

CERTIFICATION

I certify that this project work was carried out by ADEBISI, BOSEDE RACHEAL Matric No. AEE/11/0001 in the Department of Agricultural Economics and Extension, Federal University, Oye –Ekiti, Ekiti State; Nigeria.

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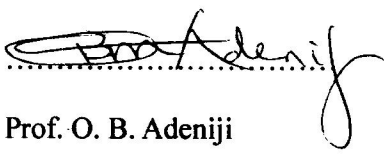

18/12/2017

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DEDICATION

This project is dedicated to the I Am that I Am, the Authority of the whole Universe.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Cassava (roots and tubers) and Rice (cereals) are common staples among small scaled farmers in developing countries like Nigeria and it is an age-long practices. The categorie of farmers that engages in value-addition of processing have recorded an appreciable income increase and has economic advantages. Hence, this study examines economic analysis of these staple foods in Ekiti State, Nigeria using two dominant local-government areas (Irepodun/Ifelodun and Ikole). The study adopted a two stage sampling procedure to select a representative sample for the study to select 140 food processors in Rice and Cassava respectively. Structured questionnaire was used to collect data used to achieve the objectives of the study. The socio-economy variables results revealed modal age range of 61-70 with mean of 55 years. Experience and years of education in food processing are significant factors. Cross tab analysis revealed that 31% of the farmers who took decision to process farm outputs further had tertiary education. Moreover, proportion of farmers that engages processing of staple foods are 95.7%. Cross tabulation analysis revealed that 34.3% of those who processed farm inputs made N100, 000.00 and above annually as against 11% of farmers who did not, while t-test statistics revealed a significant difference between farmers who processed food and those who did not. Multiple regression multiple determination (R^2) results indicated farmers' decision to processed farm outputs further are72% and income increase 74% respectively. Farmers who made significant revenue did processed farm outputs suggesting that food processing is a significant factors to income increase. Hence, the study recommends that government should formulate and implement economically viable value addition reforms policy to ensure that farmers process their farm outputs further.

Keywords: Economic analysis, Rice and Cassava processing, Profit and Loss, ANOVA.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Staple food refers to the food eaten routinely and commonly available for majority in a defined environment (United Nations Food and Agriculture Organization, 2010). Staple foods are quantities of foods that constitutes a dominant portion of a standard diet for given a people. Also, staple foods supplying a large portion of energy needs and generally forming a significant portion of the intake of other nutrients as well. (African Food Staple, 2015). Staple food may be eaten often and could serve as every day food requirements. It has been indicated that staple foods that supply one or more of the three organic macronutrients needed for survival and health such as carbohydrates, proteins, and fats (John and Foster, 2015).

Most of the global human population lives on a diet based on one or more of the following staples: rice, wheat, maize (corn), millet, sorghum, roots and tubers (potatoes, cassava, yam and taro) and animal products such as meat, milk, eggs, cheese and fish. Regional staples include rye, soybeans, barly, oats and teff. Past studies have revealed that cereal, root and tubers are common in agricultural systems and practices among small scaled farmers in developing countries (Arbizu and Tapia, 1994). These staple food categorization have been evidenced to add valued to a healthy living and provision of additional income if processed further (John and Foster, 2010).

According to (Food an Agricultural Organization of United Nation, 1995), staple foods are categorized into four (4) classes and they are: Cereal (Rice, wheat, maize, millet and sorghum), Roots and tubers (Potatoes, cassava, yam and taro), Animal products (Meat, milk, eggs, cheese and fish), Regional staples (Rye, soybeans, barly, oat and teff). Cassava (roots and tubers) and

Rice (cereals) are common cropping systems among small scaled farmers in developing countries like Nigeria. Studies have evidenced that small-scale farmers in Nigeria have age-ling practices in these identified crops. The categories of farmers that engages in value-addition of processing have recorded an appreciable income increase (John and Foster, 2010).

It has been argued that processing of these staple foods further has economic advantages and evidence has thus clearly shown positive results for those in value addition system (United Nations Food and Agriculture Organization, 2010). In addition, no study has investigated economic analysis of these staple foods in Ekiti State, Nigeria. The choice of these staple foods was born out from the fact that these staples food are commonly planted but few farmers engaged in value addition or processing further despite its economics advantages. The study hopes to identify constraints on staple food processing further and also examine economic analysis of value addition of staple food processing.

1.2 PROBLEM STATEMENT

Nigeria has the potential to be self-sufficient in Rice and Cassava production and processing both for food and industrial raw materials needs and also for export purpose. However, a number of constraints have been identified as limiting factors to rice and cassava production and processing. These include problem of research, pest and disease management, (Ajala and Gana 2015). Therefore the aim of this research will be to review the causes of the challenges facing rice and cassava processing in the two identified local government area of Ekiti State and how to overcome these problems.

1.3 RESEARCH QUESTIONS

1. What are the socio-economic variables of farmers engaged in these classes of staple foods
2. What is the proportion of farmers engage in processing of these staple foods?
3. Is there differentials in income of those engaged in processing of these staples foods and those who did not?
4. What are the factors influencing processing or not of these identified staple foods farmers?

1.4 OBJECTIVES OF THE STUDIES

The main objective of the study is to examine Economic analysis of staple foods processing among farming household in Irepodun/Ifelodun and Ikole local governments area of Ekiti state Nigeria, using Rice and Cassava as case study.

1.5 SPECIFIC OBJECTIVES ARE:

1. To determine socio-economic variables of farmers engages on staple foods cultivation
2. To investigate proportions of farmers engages in processing of these identified staple foods
3. To assess income differentials of those engages in processing of these staples foods and those who did not.
4. To examine factors influencing processing and income increase categories of farmers.

1.6 JUSTIFICATION

This study will examine the factors influencing processing or not processing of the identified

staple foods among farming household and also to assess income differentials of those engages in processing of these staple foods and those who did not.

1.7 HYPOTHESIS OF THE STUDY

Ho: There is no significance difference between those that processed staple foods and those that did not processed staple foods.

Ha: There is significance difference from those that processed staple foods and those that did not processed staple foods

CHAPTER TWO

LITERATURE REVIEW

2.1 STAPLE FOODS

Staple foods, are frequently and routinely eaten and thus constitutes a significant portion of a standard diet for a given people, providing and supplying a considerable fraction of energy needs and generally forming a significant proportion of the intake of other nutrients as well. The staple food of a specific community may be consumed as occasionally as every day or every meal, and most people live on a diet based on just a small number of staples (UNFAO, 2010). Staple foods are typically inexpensive, readily-available at various places and they are such foods that supply the organic macronutrients (carbohydrates, fats and protein) needed for energy, survival and health. Major and common staple foods include roots and tubers (such as cassava, potato, yam), cereal grains (such as rice, millet, maize, wheat), pulses (dried legumes) and other seeds are derived either from vegetables and animal products (UNFAO, 2010). Staple foods may also contain coconut oil, olive oil, and sugar depending on different region (African Staple Foods, 2015).

In different parts of the world, staple foods are a function of weather patterns, local terrain, farming constraints, acquired tastes and ecosystems. For example, the main energy source staples in the average African diet are cereals (46 percent), roots and tubers (20 percent) and animal products (7 percent) while the main staples in the average diet in Western Europe are animal products (33 percent), cereals (26 percent) and roots and tubers (4 percent).

2.1.1 GLOBAL PRODUCTION OF RICE

Rice (*Oryza sativa L.*), the most widely grown and cultivated rice, is the staple food of an estimated 3.5 billion people worldwide (International Rice Research Institute, 2013). About 870

million people are estimated to suffer from chronic undernourishment globally, the vast majority of whom live in developing countries where rice is closely associated with food security and political stability (FAO, 2012). Among the Asian populations is the production and consumption of rice the highest and dominant. Rice provides up to 50% of the dietary caloric supply and a substantial part of the protein intake for about 520 million people living in poverty in Asia. In sub-Saharan Africa, rice consumption among urban dwellers has steadily grown, with a per capita consumption that has doubled since 1970 (International Rice Research Institute, 2013). Countries in the Caribbean and Latin America regions are also reporting a steady rise in rice intake in their populations (International Rice Research Institute, 2013).

Rice, therefore, is of unique nutritional importance of large reaches of the population in the Asia Pacific region, parts of Latin America and the Caribbean and, increasingly so, in Africa (Muthayya *et al.*, 2014). It is also the primary source of income and employment for more than 200 million households across countries in the developing world (Muthayya *et al.*, 2014).

2.1.1.1 RICE TYPES AND CULTIVATION

Rice (*Oryza sativa L.*) is a semi-aquatic annual grass plant that includes approximately 22 species of the genus Oryza, of which 20 are wild. There exist two main species of rice that are important for human consumption: O. sativa and O. glaberrima. *O. sativa* was first grown in South-east Asia, somewhere in India, Myanmar, Thailand, North Vietnam, or China, between 8000 and 15,000 years ago (Muthayya *et al.*, 2014). *O. glaberrima* is thought to have been domesticated from its wild ancestor Oryza barthii by people living in the flood plains of the Niger River in Africa about 3000 years ago (Muthayya *et al.,* 2014). Today, rice is cultivated on every continent except Antarctica. Of the two cultivated species, *O. sativa* is more widely grown, including in Asia, North and South America, the European Union, the Middle East, and Africa. Cultivation of *O.*

glaberrima is confined to Africa, where it is fast being replaced by *O. sativa*. Thousands of *O. sativa* cultivars are grown in more than 100 countries.

They can be classified into three widely cultivated ecological varieties: the long-grained indica variety grown in tropical and subtropical Asia; the short/medium-grained japonica rice cultivated in temperate regions such as Japan and northern China; and the medium grained javonica rice grown in the Philippines and the mountainous areas of Madagascar and Indonesia.1Rice is cultivated in a variety of water regimes and soil types, such as saline, alkaline, and acid–sulphur soils (UNFAO, 2010; Muthayya *et al.,* 2014). Irrigated lowland systems where rice is grown in bunded fields can produce two to three crops per year, and nearly three-quarters of the world rice production. Rain-fed lowland rice is grown in bunded fields that are flooded with rain- water. The areas of greatest poverty in South Asia, parts of Southeast Asia, and essentially all of Africa use rain-fed lowland farming to produce 20% of the world's rice. Upland rice farming done in dry land conditions produces 4% of the world's total rice production (Muthayya *et al.,* 2014).

2.1.2 GLOBAL PRODUCTION OF CASSAVA

Cassava is grown in many tropical countries of Asia, Africa and Latin America. Most statistics do not usually differentiate between sweet and bitter varieties of cassava; in some, sweet varieties are not included as they are commonly grown as a secondary crop for home consumption. Brazil is the largest producer of cassava, but most of the crop is consumed locally and exports are only a small portion of the total output (Yakasai, 2010). Nigeria and other countries like Indonesia, Zaire, India and Colombia are important and major producers of cassava. On the other hand, cassava does not form an important part of the staple diet in Thailand, but presently regarded as the world's largest exporter of cassava products. In the last few years most of the important producers have greatly increased their production. Surplus production of cassava products enters international trade in

different forms, such as chips, broken dried roots, meal, flour and tapioca starch. Dried cassava roots and meal are used as raw material for compound animal feed, while cassava starch is used for industrial purposes; grocery tapioca is used solely for human consumption.

2.2 RICE PRODUCTION IN NIGERIA

Rice is grown and cultivated in virtually all the agro-ecological zones in Nigeria. Despite this act, the area cultivated to rice still appears small. In the year 2000, out of about 25 million hectares of land cultivated to various food crops, about 6.37% was cultivated for rice (Erenstein *et al.*, 2003). Rice is an increasingly important crop in Nigeria. It is relatively easy to produce and is grown for home consumption and for sale. Rice has become a part of everyday diet of many in Nigeria because of its increased production and availability. There are many varieties of rice grown in Nigeria. Some of these are considered 'traditional' variety; others have been introduced within the last twenty years. Rice is usually grown on upland fields or in the paddies, depending on the requirements of the particular variety; there is limited mangrove cultivation. New varieties are produced and disseminated by research institutes, or are imported from Asia. The fields cannot be ploughed until after the first rain, generally in May or June. During the oil boom many farmers had access to tractors, but most now undertake all land preparation and harvesting by hand. Generally tasks are allocated along gender lines, but in some areas men and women work together. Women are typically responsible for the transplanting of seedlings to the fields and threshing, whilst it is often the men who hoe (Erenstein *et al.*, 2003).

Most farmers produce one rice crop per year, but some other farmers have made irrigation channels which allow them to reap two or even three harvests in the year. This allows them to plant seedlings when there is less danger from disease or pests. At the same time, frequent planting

exhausts the soil more quickly and, as fertilizers are expensive, many farmers are noticing the falling productivity of the soil. Some farmers use organic fertilizers, including a method of green manuring by which grass is allowed to grow and is then ploughed back into the soil. Once the planting fields have enough amount of water the rice grows quickly with some varieties reaching maturity within three months. Some farmers grow the rice seedlings in nurseries and then transplant them into the main fields, as this reduces vulnerability to disease; others see the transplanting process as too costly in time. Varieties which mature quickly are preferred by farmers, as this reduces risk of exposure to disease and allows the land to be used for other crops. Whereas it was unusual for more than one crop of rice to be grown each year, many farmers relay rice with other crops, particularly sorghum.

The rice is parboiled to soften the husk, before it is milled and marketed. The parboiling is carried out in huge oil drums. After the rice has been parboiled, it is laid out on tarpaulins to dry. It is at this stage that there is a danger of small stones getting mixed up with the rice grains, reducing its marketability. Nigerian rice faces competition from imported rice which favored for its long white grains. Imported rice, although widely considered less tasty, demands less preparation as it contains no stones. Destoner is used to eliminate stones from Nigerian rice, by so doing allow Nigerian rice to compete with imported rice. Raising the quality of local rice might discourage rice importation, whilst boosting local production. Much of the milling is done by co-operatives, the largest of which is in Lafia, in Nassarawa State, where there are around 700 mills; rice milled here is transported to all parts of the country by truck. The millers, though, have noted a downturn in trade since the restrictions on rice importation were lifted.

Rice is not grown in isolation. All Nigerian farmers have a variety of crops including sorghum, maize and sweet potatoes, and many keep animals as well. Animals are grazed on open land and are fed on the crop residues. In the north of the country there is an understanding between the nomadic Fulani people and agricultural farmers; Fulani farmers bring their cattle herds onto the fields after harvesting, allowing them to eat the crop residues, and fertilize the fields with manure. In the south, they are not tolerated to such a wide extent, and agricultural farmers tend to believe them to be destructive; this can lead to disputes between settled and nomadic farmers. Chickens, sheep, goats and pigs contribute to the household food security of many (Erenstein *et al.*, 2003).

2.2.1 EMPIRICAL STUDIES ON POLICIES INFLUENCING RICE PRODUCTION

Policies were introduced on rice importation in Nigeria by the government in 1995 and this was propounded by the IMF and World Bank. These policies brought about a drastic downfall on rice production in Nigeria when the ban was lifted. There was ban on the importation of rice which made it illegal for someone to import rice into the country Nigeria (Emodi and Madukwe, 2008). This discouraged domestic production within the country and it increased much dependence on rice importation into the country which at brought about more result for the economy in relation to its foreign income and food security.

Emodi and Dimelu (2011) observed that, "there will be an encouragement of the local producers of rice when a ban is put in place on the importation of rice in Nigeria. In as much as there are other challenges on the production of rice in Nigeria, looking up for adequate solutions for this purpose requires majors steps to be taken by the government to ban the importation of rice and rather create an avenue for the foreign investors to come and invest in Nigeria where rice can be produced locally". Kebbeh et al. (2003) relates a decline in rice production in Nigeria, to the

introduction of the Structural Adjustment Programme (SAP) that bedeviled the Sub-Saharan African countries where subsidies were eliminated. The subsidies were known as key support to the farmers. With the aid of the subsidies, the farmers were enabled to acquire the needed support through provision of fertilizers at low costs as well as other inputs for the purpose of domestic rice production. In the area of irrigated rice production which is majorly practiced in the northern part of the country, it became very difficult to purchase the needed inputs since this type of farming requires much money to start the farming system known as irrigation. The problem of irrigated rice production is largely faced by the poor farmers who are in the production sector. This is because access to credit facilities becomes difficult and therefore, there arises a need for the government through a functional system that is decentralized as a mechanism for the purpose of obtaining credit facilities Kebbeh et al. (2003). Emodi and Madukwe (2008) also focused on the needed initiatives in rice innovation system, rice production, and the identified gaps that exist in rice policies. Nigeria is the highest consumer of rice within the West African sub-region. He further argued that, the quality of production of rice which is mostly imported in Nigeria is far better than the locally produced rice. That its consumption to some individuals is a habit; while to others is quality preference over the locally produced rice. The Nigerian population is by far greater than the rest of the West African countries; most homes depend on rice consumption and having it as an everyday meal (Akaeze, 2010).

Figure 1: Area Cultivated and Rice Output in Nigeria

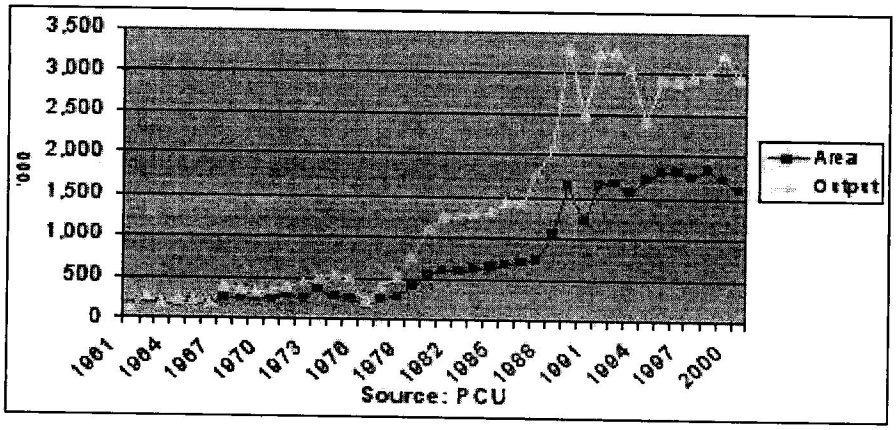
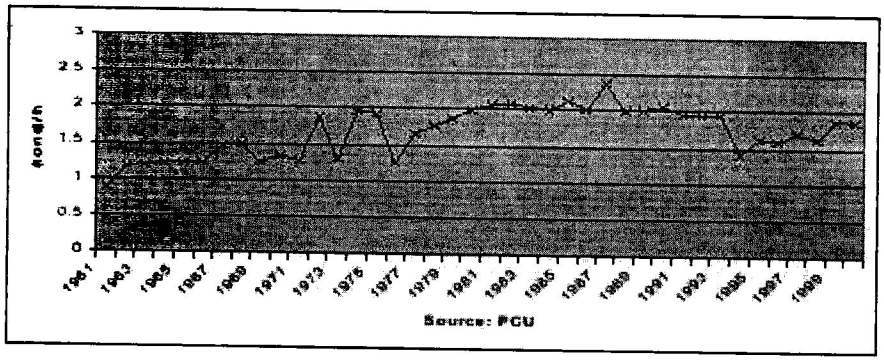
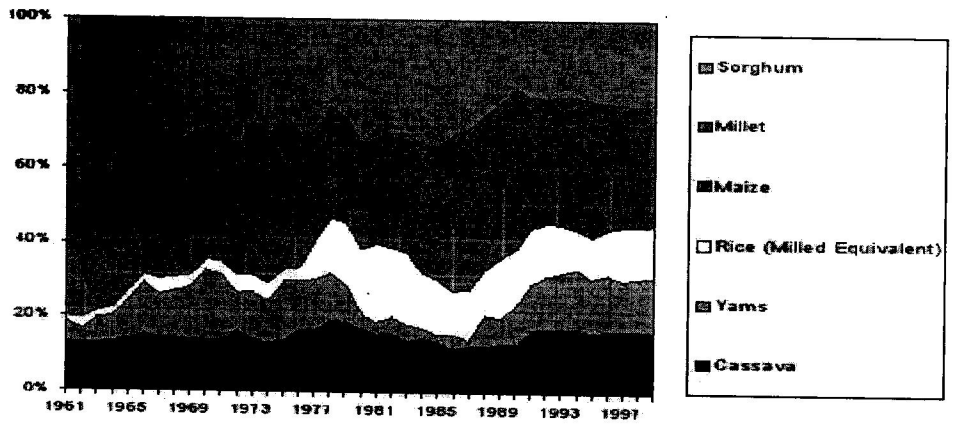


Figure 2: Yield of rice in Nigeria





Source: computed from FAO-Agraostat.

Figure 3: Evolution of the share of the main staples in Nigerian average food consumption in calories terms.

2.3 CASSAVA PRODUCTION IN NIGERIA

Cassava (*Manihot esculenta*) production is important and agro productive sector to the economy of Nigeria as the country is considered the world's largest producer of the commodity. The crop is produced in 24 of the country's 36 states. Cassava is a major staple crop in Nigeria, as cassava and its product are found in the daily meals of Nigerians (Onyenwoke and Simonyan, 2014). Currently, cassava is undergoing a transition from a mere subsistent crop found on the field of peasants to a commercial crop grown in plantations. This unprecedented expansion on this crop is attributed to its discovery as a cheap source of edible carbohydrate that could be processed into different forms of human delicacies and animal feeds (Onyenwoke and Simonyan, 2014). Cassava (*Manihot esculenta Crantz*) is a perennial woody shrub with an edible root, which grows in tropical and subtropical areas of the world. Cassava plays a particularly important role in agriculture in developing countries, especially in sub-Saharan Africa, because it does well on poor soils and with low rainfall, and because it is a perennial crop that can be harvested as required. Its wide harvesting window allows it to act as a famine reserve and invaluable in managing labour schedules. It offers flexibility to resource-poor farmers because it serves as either subsistence or a cash crop (Onyenwoke and Simonyan, 2014). In 1999, Nigeria produced 33 million tonnes, while a decade later, it produced approximately 45 million tones, which is almost 19% of production in the world.

The average yield per hectare is 10.6 tones (IITA, 2013). Nigeria currently produces about 54 million metric tones (MT) per annum (FAO, 2013), making her the highest cassava producer in the world, producing a third more than Brazil and almost double the production capacity of Thailand and Indonesia. However, Nigeria is not an active participant in cassava trade in the international markets because most of her cassava is targeted at the domestic food market. The production

methods are primarily subsistence in nature and therefore unable to support industrial level demands (FAO, 2013).

In Nigeria, cassava production is well-developed as an organized agricultural crop. It has well-established multiplication and processing techniques for food products and cattle feed. There are more than 40 cassava varieties in use. Though the crop is produced in 24 of the country's 36 states (USAID, 2013), cassava production dominates the southern part of the country, both in terms of area covered and number of farmers growing the crop. Planting occurs during four planting seasons in the various geo-ecological zones. The major states of Nigeria which produce cassava are Imo, Anambra, Edo, Delta, Benue, Oyo, Cross River and Rivers, and to a lesser extent Kwara and Ondo (IITA, 2012).

Food processing is the transformation of raw ingredients, by physical or chemical means into food, or of food into other forms. Food processing combines raw food ingredients to produce marketable food products that can be easily prepared and served by the consumer. Food processing typically takes clean, harvested crops and plant products and uses these to produce attractive, marketable and often long-life food products (CMPPF, 2015).

Food processing dates back to the prehistoric ages when crude processing incorporated fermenting, sun drying, preserving with salt, and various types of cooking (such as roasting, smoking, steaming, and oven baking), Such basic food processing involved chemical enzymatic changes to the basic structure of food in its natural form, as well served to build a barrier against surface microbial activity that caused rapid decay. Modern food processing also improves the quality of life for people with allergies, diabetics, and other people who cannot consume some

common food elements. Food processing can also add extra nutrients such as vitamins (*Laudan and Rachel, 2010*). Figure 1 and Figure 2 shows the flow chart for rice and cassava processing.

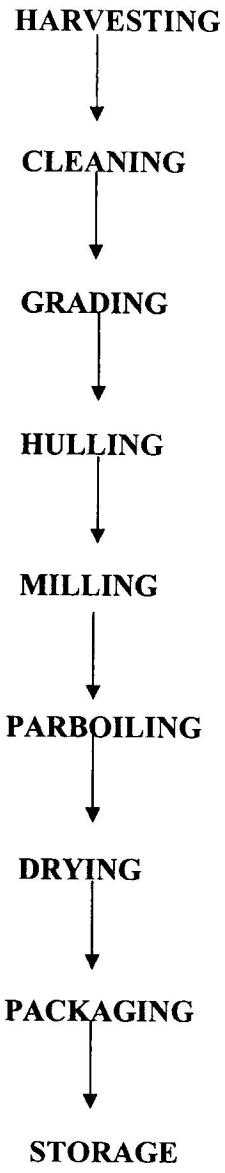


Fig 1: Flow chart for the production of rice in Nigeria

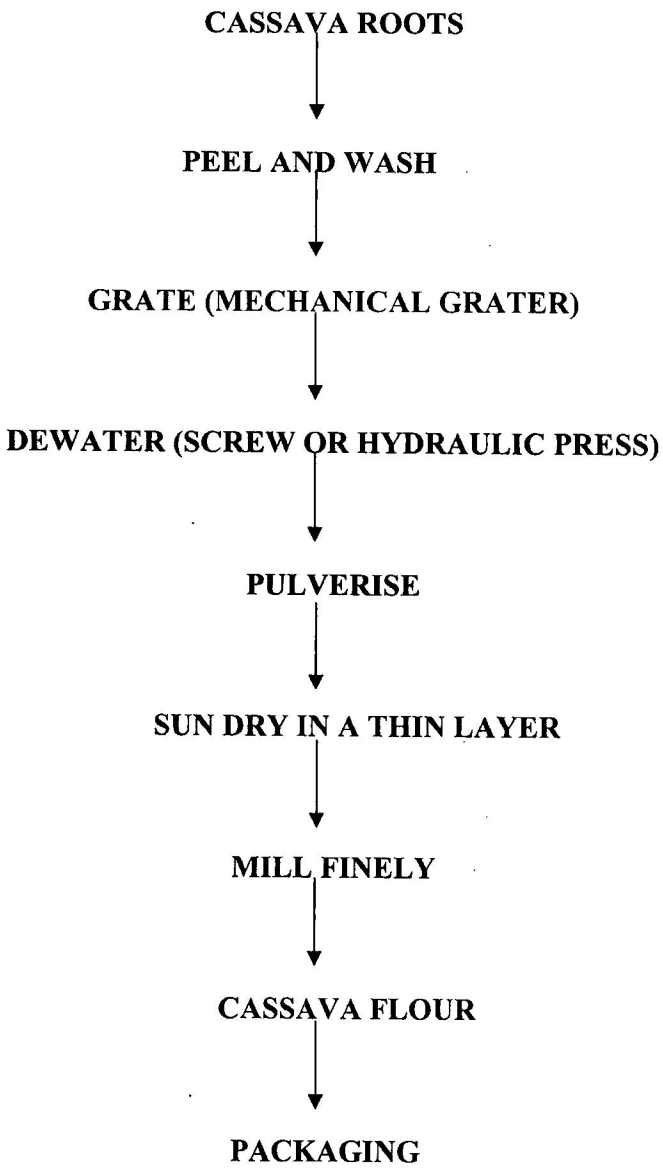


Fig 1: Flow chart for the production of unfermented cassava flour in Nigeria

(Source: Onabolu, Abass and Bokanga, 1998)

2.4 ECONOMIC BENEFITS OF STAPLE FOODS (RICE AND CASSAVA) PROCESSING

Of all the staple crops, rice has risen to a position of importance. Since the mid-1970s, rice consumption in Nigeria has risen tremendously, at about 10% per annum due to changing

consumer preferences. Domestic production has never been able to meet the demand, leading to considerable imports which today stand at about 1,000,000 metric tons yearly. The imports are procured on the world market with Nigeria spending annually over US$300 million on rice imports alone (Akande, 2008). Okpe et al. (2014), researched on the profitability of rice processing in Nigeria. The study found rice processing profitable although net return per month varied among respondents. In addition, the study found that the unit net returns to processing activities increased with quantity of rice processes. This suggests that millers were achieving economies of scale in their rice processing operations and therefore should increase their levels of operations since the potential of reducing the level of poverty has been recognized.

West African Rice Development Association (WARDA) (2003) studied the Nigerian rice economy in a competitive world. The study revealed that local rice is less competitive than imported rice due to low quality, high production and milling cost. Studies conducted by Saito et al. (2006) using simple regression analyses to investigate the efficacy of upland rice cropping found that rainfall during the reproductive stage explained 38-67 percent of the variation of upland rice yield in the Philippines. In developing a framework for food security in Nigeria, Oriole (2006) observed that the framework for food security and poverty reduction should go beyond crop production and that it should centre on the political will of the government. The attention to agricultural production should go beyond providing lip services to agricultural production most especially as it affects irrigation in the economy. The effect of government policy on rice production was also done in Vietnam. Tran and Kajisa (2006) used long term regional yield and modern variety adaptation statistics as well as household data from 1996 and 2003 to investigate the effect of the Green Revolution on rice production in Vietnam. The study shows that with the end of the Green revolution in the mid 1980's in the Philippines, it is still sustained in Vietnam and

the growth rate outweighs any other Asian country. Akande (2008), researched on Nigerian rice economy. He found that Nigeria is the highest producer of rice in West Africa but is also a massive importer of rice which tends to negatively affect the price of locally produced rice. Apata et al. (2010) carried out a research on the determinant of rural poverty in Nigeria. The study acknowledged the fact that small farmers are one of the more disadvantaged and vulnerable groups in Nigeria. Cassava on the other hand, is the source of raw materials for a number of industrial products such as starch, flour and ethanol. The production of cassava is relatively easy as it is tolerant to the biotic and edaphic encumbrances that hamper the production of other crops. Cassava's roots are used only to store energy, unlike the roots of sweet potato and yam that are reproductive organs. Despite their agronomic advantages, root crops are far more perishable than the other staple food crops. Once out of the ground, some root crops have a shelf life of only few days. Roots as living organs of plants continue to metabolize and respire after harvest. Cassava has a shelf life that is generally accepted to be of the order of 24 to 48 h after harvest (Andrew, 2002).

Cassava utilization patterns vary considerably in different parts of the world. In Nigeria, the majority of cassava produced (90%) is used for human food (IITA, 2010). Cassava is very versatile and its derivatives and starch are applicable in many types of products such as foods, confectionery, sweeteners, glues, plywood, textiles, paper, biodegradable products, monosodium glutamate, and drugs. Cassava chips and pellets are used in animal feed and alcohol production. Animal feed and starch production are only minor uses of the crop in Nigeria. Cassava, in its processed form, is a reliable and convenient source of food for tens of millions of rural and urban dwellers in Nigeria (IITA, 2010).

2.5 NUTRITIONAL VALUES OF STAPLE FOODS (RICE AND CASSAVA ROOTS)

Rice has become a major source of calories for the rural dwellers and the urban poor. For example, the poorest third of urban households obtain 33% of their cereal-based calories from rice, and rice purchases represent a major component of cash expenditures on cereals (Akande, 2008). The nutritional composition of cassava depends on the specific tissue (root or leaf) and on several factors, such as geographic location, variety, age of the plant, and environmental conditions. The roots and leaves, which constitute 50 and 6% of the mature cassava plant, respectively, are the nutritionally valuable parts of cassava (Tewe and Lutaladio, 2004). Cassava root is an energy-dense food. In this regard, cassava shows very efficient carbohydrate production per hectare. It produces about 250,000 calories/hectare/day (Julie et al., 2009), which ranks it before maize, rice, sorghum, and wheat. The root is a physiological energy reserve with high carbohydrate content, which ranges from 32 to 35% on a fresh weight (FW) basis, and from 80 to 90% on a dry matter (DM) basis (Julie et al., 2009). Eighty percent of the carbohydrates produced is starch (Gil and Buitrago, 2002); 83% is in the form of amyl pectin and 17% is amylose (Rawel and Kroll, 2003). Roots contain small quantities of sucrose, glucose, fructose, and maltose (Tewe and Lutaladio, 2004). Cassava has bitter and sweet varieties. In the latter varieties, up to 17% of the root is sucrose with small amounts of dextrose and fructose (Laudan and Rachel, 2010). Raw cassava root has more carbohydrate than potatoes and less carbohydrate than wheat, rice, yellow corn, and sorghum on a 100-g basis. The fibre content in cassava roots depends on the variety and the age of the root. Usually its content does not exceed 1.5% in fresh root and 4% in root flour (Gil and Buitrago, 2002). The lipid content in cassava roots ranges from 0.1 to 0.3% on a FW basis.

This content is relatively low compared to maize and sorghum, but higher than potato and comparable to rice. Cassava roots have calcium, iron, potassium, magnesium, copper, zinc, and

manganese contents comparable to those of many legumes, with the exception of soybeans. The calcium content is relatively high compared to that of other staple crops and ranges between 15 and 35 mg/100 g edible portion. The vitamin C (ascorbic acid) content is also high and between 15 to 45 mg/100 g edible portions (Charles *et al.,* 2004). Cassava roots contain low amounts of the B vitamins, that is, thiamine, riboflavin, and niacin (Table 1), and part of these nutrients is lost during processing. Usually the mineral and vitamin contents are lower in cassava roots than in sorghum and maize (Gil and Buitrago, 2002). The protein, fat, fibre, and minerals are found in larger quantities in the root peel than in the peeled root. However, the carbohydrates, determined by the nitrogen- free extract, are more concentrated in the peeled root (central cylinder or pulp) (Gil and Buitrago, 2002). Thus, cassava roots are rich in calories but low in protein, fat, and some minerals and vitamins. Their nutritional value is, consequently, lower than those of cereals, legumes, and some other root and tuber crops such as potato and yam. The cassava crop consists of 15% peel and 85% fresh tuber flesh. The tuber consists of 20 – 30% starch, 62% water content, 2% protein, 1 – 2% fibre with trace of vitamins and minerals. There are many derivatives from cassava example being starch, ethanol, monosodium glutamate, paper and textiles etc.

2.6 FACTORS AFFECTING PRODUCTION OF STAPLE FOODS

Staple foods (Rice and cassava) production is the main factor of the most influential, so effort to increase staple foods (rice and cassava) production. Major factors affecting food security at household level farmers are:

(1) The number of family members (participation age to work in the agricultural sector), (needs improvement);

(2) The production of rice and cassava, (need to increase productivity);

(3) The acquisition and exploitation of land, (there needs to be institutional innovation and intensification of land). Of the main factors affecting production and consumption are:

(1) Consumption of rice and cassava, (need to decrease/diversification). In terms of the welfare of farmers, the main factors that influence are:

(1) The production of rice, (need to increase productivity);

(2) Land tenure, (need to increase the intensity);

(3) Farmer exchange value, (needs improvement).

These findings are in line with and conform to the main factors affecting food security at regional level aggregate in Great Solo (Darsono, 2016), except exchange rates and household income farmers.

CHAPTER THREE

METHODOLOGY

3.1 AREA OF STUDY

Ekiti State, Nigeria was created on 6 July 1996 from the former old Ondo State. The State current poverty level is 45.7% and unemployment rate of 12.5% (NBS, 2012). The present Ekiti state has been regarded as landlocked areas and land fragmentation has been seriously influenced. The state is made up of 16 Local Government Areas, with Ado-Ekiti as the state capital. The state lies entirely in the tropics.

Ekiti is bounded in the North by Kogi States; in the East by Ondo State; in the West by Oyo and Ogun States. The land area is 14,788,723 Square Kilometers (km2) with a population of 3,441,024 comprising 1,761,263

males and 1,679,761 Females.

The study areas of this research are both Ikole and Irepodun/Ifelodun Local government areas of Ekiti State. Ikole and Irepodun/Ifelodun Local Government areas are predominantly a homogenous society which is carefully populated by Yoruba speaking people of the South West Zone of Nigeria. The Religious of the people are mainly Christian and Islamic religious while a percentage of the people are Traditional religion worshippers. It is observed that agricultural practices and Timber/Saw mills are the thriving industries. Geographically, Ikole Local Government is entirely within the tropic, which is located between longitude 45^0 East of Greenwich and latitude $7^0 - 8^0 - 15^0$North of the Equator. Its neighbors' are Kwara State to the North, Kogi State to the North east, Ekiti East to the East, Gboyin Local Government in the South and Oye Local government in the West. The headquarters of the local government, Ikole- Ekiti is about 22.5 kilometers from Ado – Ekiti, (Ekiti State capital). The

local government is mainly on the upland zone rising to about 250 meters above the sea level.

The geographical location of Irepodun/Ifelodun Local Government areas is between latitude of 7.4^0N and longitude 4.9^0E. Irepodun/Ifelodun Local Government is bounded by Ilejemeje Local Government to the North, Oye to the South, Ire Government to the East and Ido/Osi Local Government to the West. It comprises the following towns and villages: Igbimo, Iluomoba Isan, Ijesa-Isu and a host of others.

Agriculture is the main occupation of the people in the area of study which provides income and employment for more than 75% of the population of Ekiti State. The main cash crops are cocoa, coffee, kolanut, cashew and oil palm. Other tree crops include citrus fruits, coconut, mango, and sugar-cane, guava and pine apple. Because of the conducive climatic condition, the state enjoys luxuriant vegetation. It also boasts of various species of timber that provide raw materials for wood based industries. Among the food crops are: yam, cocoyam, cassava, maize, plantain/banana, rice, beans, pepper, tomatoes and varieties of vegetables. The State enjoys tropical climate with two distinct seasons. These are the Rainy season (April–October) and the Dry season (November–March). Temperature ranges between 21° and 28 °C with high humidity. Tropical forest exists in the south, while Savannah occupies the northern peripheries. The mean annual total rainfall in the south is about 1800mm while that of the northern part is hardly over 1600mm.

According to the 2006 census reports, the population of Ekiti state stood at 2,737,186 (NPC, 2006).The main occupation of the people includes: Farming, Trading, Civil Service, Pottery, Artisanship e.t.c. The main staple food of the people of Ekiti is Pounded yam with Isapa soup or

vegetable soup. Food crops like yam, cassava, and also grains like rice and maize are grown in large qualities. Other notable crops like kola nut and varieties of fruits are also cultivated in commercial quantities. There are 16 dominant areas in Irepodun/Ifelodun and Ikole (LGAs) in Ekiti State. The apex of the administrative areas is the capital, Ikole in Ikole Ekiti and Igede in Irepodun/ifelodun local government area. Ekiti state is divided into four Agricultural Zones by the Ekiti State Agricultural Development Project (EKADP) authority based on agro-ecological considerations. Cassava cultivation is more prominent in Ikole local government and Rice in Irepodun/ifelodun local government.

3.2 SAMPLING TECHNIQUES AND DATA COLLECTION

A multi-stage stratified random sampling technique was employed for data collection. In the first stage of the sampling process, the Agricultural Development Project (ADP) Zone of Ekiti Central zone was considered. In the second stage, two local governments were selected on the basis of indices of food processing outlets in the state through past studies. In the third stage, purposive towns were selected that is known for food processing. Two towns were identified from ikole local government and one from Irepodun/Ifelodun. In the final selection; seventy farmers were randomly selected from each local governments through the list provided ADP of farmers that had participated/benefitted from their past work/training. The final analyses of data collection were shown on Table 3. A total of 140 respondents (82.4% response rate) were good for further analysis.

Table 1: METHOD OF DATA ANALYSIS

Objectives	Meaning	Data required	Analytical tools
1) To determine socio-economic variables of farmers engages on staple foods cultivation	To provide basic information of the respondents who in this case are the farmers that engages on staple foods cultivation	Age, Gender, Marital status, Educational level, Household size, Primary Occupation, Secondary Occupation, Income, and number of Income earners of Households that process staple foods.	Descriptive statistics such as frequency tables mean and percentages.
2) To investigate proportions of farmers engages in processing of these identified staple foods	To examine the ratio of farmers who are into processing of identified staple foods	Population, proportion and sex ratio of birth of the farmers who engages in processing of these identified staple foods.	Descriptive statistics such as frequency tables mean and percentages.
3) To assess income differentials of those engages in processing of these staples foods and those who did not.	To estimate profit of the food processors and non-food processors.	Employment pattern, source of income, individual characteristics, or household future of those who engaged in the process of staple foods and those who did not.	Cross tabulation analysis, income differentials between food processors and none, t-test statistics.
4) To examine factors influencing processing or not of these identified staple foods	To investigate factors affecting the processing of the identified staple foods and income	To know the relationship between these identified staple foods and income generated from it.	Multiple Regression analysis

3.3 METHOD OF DATA COLLECTION

Structured questionnaire was administered on identified 140 households' heads (respondents). Data were collected on the socio-economics characteristics of identified households such as, Age, Sex, Marital status, Primary Occupation, Secondary Occupation, Educational level of Household head, Household size, Household income, Number of household income earners. Data were also collected on mode of farming operations and factors influencing same.

3.4 ANALYTICAL PROCEDURE

In order to examine factors influencing food processing or not among farming households in the

identified study areas, income status through their participation on processing or not will be regressed against selected variables were identified and collected. The Study adopted the use of Multiple Regression Model and expressed as

$Y = b_o + b_1X_1 + b_2X_2 + b_3X_3 + ... + b_{12}X_{12} + u$

Where Y is the likelihood of presence of the characteristics of interest (the characteristics of interest is whether a farmer process further).

Where Y = Do you process food or not and Income status of household/income increase

b = Constant

b_i = Coefficients

$X_1 - X_{12}$ = Independent variables.

U = Error term assumed to have normal distribution with zero mean, and constant variance i.e $U \sim N(0\ \sigma_2)$ and $E(U_i, U_j) = 0_{ij}$.

The following variables are hypothesized as having significant influence on the income status of households, as well as factors influencing decision to process or not: Age (X_1), Gender/Sex (X_2), Marital Status (X_3), Family size (X_4), Years of Schooling (X_5), Farming Experience (X6), Acquisition of present farm (X_7), No of land use for agricultural purposes (X_8), Agricultural Practices (X_9), Sources of farm finances (X_{10}), do you processed food or not (X_{11}) and Cost of farming inputs (X_{12}). The selection of these variables was based on economic theory and suggestions of previous/similar studies. The ordinary least square (OLS) techniques was used to estimate the model.

3.4.1 Assumption for the use of multiple regression for the study

1. It does not need a linear relationship between the dependent and independent variables. Multiple regression can handle all sorts of relationships.

2. The independent variables do not need to be multivariate normal – although multivariate normality yields a more stable solution. Also the error terms (the residuals) do not need to be multivariate normally distributed.

3. Homoscedasticity is not needed.

4. It can handle ordinal and nominal data as independent variables. The independent variables do not need to be metric (interval or ratio scaled).

3.4.2 Variables and their definitions

Dependent variable

The dependent variable used for this study follow 2 forms

1. Decision to process food further
2. Income, this is captured by income or losses accrued.

Independent variables

For this study, 12 independent variables (see Table 2) were identified and hypothesized to influence decisions to process food further and for income increase also.

Table 2: LIST OF INDEPENDENT VARIABLES AND MEASUREMENTS

S/N	Variables	Measurements and operationalization	Expected signs
1	Age (X1)	Measured in terms of number of years of age	negative relationship
2	Gender/Sex	Male or female (Binary)	
3	Marital Status	This indicates whether respondents are married, unmarried, single, or widowed. This data was operationalized through scoring system labelled from questionnaire	positive relationship among married respondents.
4	Family size	The size of the family of the respondent measured in terms of total number of members in the family including the elderly and children.	family size was assumed to have positive relation

5	Years of Schooling	Education refers to the level of formal and non-formal education and this was scored in terms of ability to read and write and enrolment in primary, secondary schools or post-secondary.	positive relationship
6	Farming experience	Studies have identified experience greatly influences outcome	variable was assumed to influence positive outcome
7	Acquisition of farmland	Method in which farm is being acquired for farming purposes was captured	variable was assumed to influence positive outcome
8	Land used for farming	This refers to the area of cultivated land owned by the respondents or their families. It was assumed that the larger the farm size, the better access the farmer has to use combination of technological packages on the land.	Therefore, it was hypothesized that land size has a positive relationship
9	Agricultural practices	This refers to method of agricultural operations carried out on the farm	variable was assumed to influence positive outcome
10	Sources of farm inputs	Access to credit has impact on the level of utilization of recommended technological packages and this in turn will expose respondents to divergent information.	variable was assumed to have a positive relationship
11	Food processed or not	This refers to factors influences decision to process food further or not (Binary)	variable was assumed to influence positive outcome
12	Cost of farm inputs	Operationally defined as the value of the products of the household after home consumption and income obtained from off-farm and non-farm activities that are expressed in Naira per year.	The income level was anticipated to have a positive relationship

Table 3: DISTRIBUTION OF SAMPLE SIZE AND COLLECTION;

Zone	Local Government	Town	Questionnaire Distributed	Questionnaire Returned
ADP Central	Ikole	Umoru/Otunja	30	23
		Odo-oro	55	47
	Irepodun/Ifelodun	Igbimo	85	70
	Total		**170**	**140**

Source: Field survey, 2017

Analysis on Table 3 revealed that 85 questionnaire were distributed across the LGAS to give a total of 170. 140 questionnaires were returned and were used for subsequent analysis. The 30 questionnaires that were not used comprises unreturned questionnaire, missing information in the questionnaire and incomplete data in the questionnaire.

The selections of sampled farmers were accomplished in the final stage of sampling process.

Farmer's selection included two steps: the first was to select farmers that have processed food and others who did before and do not engaged in processing presently and secondly, based on the farmer's list obtained from identified sources in the selected towns.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 DESCRIPTION OF SOCIO-ECONOMICS VARIABLES

4.1.1 Age distribution of household heads

Past studies have indicated that Nigeria's economy is predominantly agricultural, which implies that a large proportion of the populace derive their livelihoods from crop production, fishing and forestry. Consequently, there is need to review the age range which can cope with this labour-intensive and drudgery associated with crop production, fishery and forestry production. In addition too, there has been argument on the issue of value addition, many past studies testified to the merit of value addition. Yet empirically, very few studies have looked into it. This research examined socio-economics variables that influencing value addition in the form of food processing. The economy of Ekiti State of Nigeria is predominantly agricultural. This implies that a large number of the populace derived their livelihoods from agricultural and related activities. This draws attention to the need for the age range, which can cope with the labour-demanding nature of agricultural production activities.

Table 4 shows the age distributions of household's heads.

Table 4: Age distribution of Household heads

Age group	Frequency	Percentages (%)
21 -30	3	2.1
31 – 40	16	11.4
41 – 50	29	20.7
51 – 60	42	30.0
Above 60	50	35.7
Total	**140**	

Source: Field survey, 2016

Result from Table 4 shows that the modal age range is Above 60 years. An average household head was 55.29 with standard deviation of 10.4 and active age group of 61-80 years constitutes 35.7% of the respondents. This suggests that the population is ageing and cannot contribute productively to agricultural productions. Hence, there is an urgent need to encourage young people particularly those in their active age group participate in food processing and other value addition activities.

4.1.2 Distribution of family size and sex of household heads.

The size of household could provide important information on the income generation, food processing and livelihood activities because of its possible correlation with welfare. Evidence abound pointing to the fact that poor people tend to live in large-size households while non-poor tend to live in small-size households (Grootaert, 1997; Ellis, 1998). The impact of large family size is such that it reduces the per capita expenditure of the family thereby aggravating poverty in the household. The distribution of the family by size is shown below:

Table 5: Family size grouping* Gender Cross tabulation

		Gender		
		Male	Female	**Total**
Family size grouping	1-3	4	2	7
	4-6	30	18	25
	7-9	27	7	26
	10-12	16	1	13
	13-20	32	3	9
Total		**109**	**31**	**140**

Field Survey: June, 2017

The result from Table 5 shows that about 18.6% of the households fall between household sizes 7-9 with mean of 9.34. This outcome is large enough to attract high dependency burden in terms

of many mouths to feed. Even though family size tends to reduce per capita expenditure, it can also enhance it. This has to do with the distribution of household between adult and children and also whether such adult is working, thereby supplementing the household income or is a dependent. The implication of this finding is that the higher the dependency burdens the more the household consumed farm outputs? Thus, reduces marketable farm outputs sold, reducing household income and gravitates towards poverty status, and vice versa. This has to do with the distribution of household between adult and children and also whether such adult is working, thereby supplementing the household income or is a dependent.

4.1.3 Sex and Marital Status of Respondents

It is a known fact that gender relations largely determine household security, provisions as well as poverty status (Ellis, 1998). It is shown from Table 4 that 80.0% are married while the remaining 13.6 % are widowed or divorced/separated. The implies that there exist a mutual benefits derived in working together as husband and wife, where risks are spread, better decision- making opportunity and larger pool of resources existed for the enhancement of the family. This will, as a matter of fact affects their level of living, provisions to meet household's basic needs and welfare status.

Table 6: **Marital Status* Gender Cross tabulation**

		Gender		
		Male	**Female**	**Total**
Marital Status	Married	92	20	112
	Single	7	2	9
	Divorced/Separated	7	2	9
	Widowed	3	7	10
Total		**109**	**31**	**140**

Field Survey: June, 2017

Table 7 presents the causal relationship between profit earned or losses as a result of farmers engaging in food processing and experience. Literature have documented that the more experienced a farmer becomes the greater the efficiency. Table 5 results indicated that those farmers that made losses were 37.9% out of which 15.1% were in the category of farmers who did not processed farm outputs further. In addition, 28.6% made over N150,000 naira. This category of farmers who made such amounts did processed farm outputs. The relationship between years of experience in food processing and profit earned revealed a decisive link. The higher the experience, the higher the farm profit. The evidence from Table 5 revealed that 48.6% of farmers who processed farm outputs made N50,000 naira and above annually. This finding thus confirms that value addition of food processing is significant.

Table 7: Income earning grouping * Farm size grouping Cross tabulation

		Food processing experience (yrs)					
		4-6	7-9	10-12	**13-15**	**16+**	Total
Profit/Loss (Naira)	1-10000	0	0	0	0	3	3
	10001-25000	0	2	0	1	8	11
	25001-50000	0	1	0	1	4	6
	50001-75000	0	1	1	0	8	10
	75001-100000	0	1	1	1	5	8
	100001-150000	0	1	2	1	6	10
	150001-1000000	0	0	4	2	33	40
	Loss (-1 - -150000)	1	1	4	12	35	53
Total		**1**	**7**	**12**	**18**	**102**	**140**

4.1.4 Years of Schooling of household heads

Education is vital for boosting the productivity of the human factor of production and making people more aware of opportunities for earning a living. It has been found that a one-year increase in the average length of schooling could push up GDP by 3% (Grootaert, 1997). The income of a household is a function of the number of persons working in the household and sometimes the level of educational attainment (Scherr, 1999).

Therefore, the level of education in the study area varied from non-formal education to secondary and tertiary institutions. Thus, the number of years spent in school varies from 0-17 years.

Table 8.Therefore, describes the distribution of household heads by the highest years of educational attainment.

Table 8: Years of educational attainment of household heads.

Educational attainment	Frequency	Cumulative
No formal education	13	9.3
Primary school	29	20.7
Secondary school	41	24.3
Post-secondary school	14	10.0
Tertiary institution	43	30.7
Total	**140**	

Source: Field survey, 2016

Result from Table 8 revealed that those that attended tertiary institution (like, polytechnic, colleges of education, University among others) are in modal class of 43.0%. This suggests a fairly literate populace. The higher the educational level, the more the individual is expected to

recognize opportunities for earning a living. Also, this can help in determining the types of non-farm livelihood sources to be engaged into to increase household income. The educational status reveals that the majority of the respondents (about 50%) had secondary education and above. This suggests that most households' heads will recognize opportunities for earning an extra income for the household upkeep.

This evidence tends to confirm the argument that there is a link between educational attainment, the income earning potential of the household and poverty as asserted by Okurut *et al* (2002). Education attainment of the household heads revealed a fairly literate population. This finding thus suggests that dissemination of new ideas and methods can easily be disseminated and received. Thus, there is a need for adequate and more representation of extension personnel in the area of study. Moreover, cross tab revealed that 31% of farmers who took decision to process farm outputs further had tertiary education as against 1% of category of farmers who had similar education took decision not to process farm outputs further. Hence, this findings supports past studies that education influences opportunities to add value to farm outputs and for earning an extra income.

4.2 ANALYSIS OF OBJECTIVES

Objective 2: What is the proportion of farmers engage in processing of these staple foods?

Table 9 revealed that 95.7% of the respondents process their farm outputs out which cassava processing took 43.6% (Table 10). Also Rice took 26.4% and both cassava and rice took 25.7% respectively (Table 10). Knowledge of processing the agricultural produce, availability of processing machine and to attract more gain are some of the factors that motivates food

processing (Table 11). Moreover, the cross tabulation analysis of food processors and none food processors in terms of profit/loss generation. Results revealed that 34.3% of those who processed their farm inputs made N100, 000.00 and above annually as against 11% of farmers who did not processed. In addition, farmers who did not processes and accounted for losses are 4.3% (Table 12). This evidence suggest that value addition is a significant factors to income increase and welfare improvement among food processors in Ekiti State.

Table 9: Do you process your farm outputs?

Do you process farm outputs?	Frequency	Percent
Yes	134	95.7
No	6	4.3
Total	**140**	**100.0**

Table 10 Processed farm outputs?

Processed farm outputs?	Frequency	Percent
Cassava	61	43.6
Rice	37	26.4
Cassava and Rice	36	25.7
Did not processed	6	4.3
Total	**140**	**100.0**

Table 11: Reasons for processing farm outputs?

Do you process farm outputs?	Frequency	Percent
Availability of processing machine	23	16.4
Knowledge of processing the agricultural produce	62	44.3
To add value to the agricultural produce to make more money	27	19.3
To attract more profit/gain		
Assurance of market	18	12.9
	4	2.9
Total	**134**	**95.7**

Table 12: Income earning grouping * Product processed

		Product processed			
		Cassava	Rice	Cassava and Rice	Total
Profit/Loss (Naira)	1-10000	3	0	0	3
	10001-25000	2	4	5	11
	25001-50000	4	2	0	6
	50001-75000	3	3	0	6
	75001-100000	4	3	0	7
	100001-150000	6	1	2	9
	150001-1000000	13	12	14	39
	Loss (-1 - -150000)	22	12	9	43
	Did not processed	3	5	8	16
Total		**63**	**37**	**40**	**140**

Objective 3. Is there differentials in income of those engaged in processing of these staples foods and those who did not?

In providing response to objective 3, the study examined income of those category of farmers who processed foods as against those who did not, in addition too, the study evaluated the significance difference between farmers who processed food as against who did not. Hence, this helps to provide answer to the hypothesis of the study. Evidence from Table 13 revealed that 25% of those farmers that processed food made significant profit (₦200,001 – ₦750000) as against zero profit for farmers who did not processed food further (Table 11).

Table 13. Profit and loss grouping * Do you process your agricultural outputs Cross tabulation

Count

		Do you process your agricultural outputs		
		Yes	No	Total
Profit and loss grouping	1-10000	3	0	3
	10001-25000	11	0	11
	25001-50000	6	0	6
	50001-75000	6	4	10
	75001-100000	7	1	8
	100001-150000	9	1	10
	150001-200000	8	0	8
	200001-750000	31	0	31
	-500000- -1	43	0	43
Total		124	6	130

Source: Computer print out

Further test was carried out using t-test statistics to test whether there is a significant difference from those that processed food and those who did not.

Hence, the study develop the null and alternative hypothesis to test the linear relationship between farmers who processed food further as against those who did not.

$H_0 = 05$: There is no significance difference between those that processed staple foods and those that did not processed staple foods.

$H_1 \neq 0$ There is significance difference between those that processed staple foods and those that did not processed staple foods.

(j) At the .05 level of significance, determine whether food processed and income increase are linearly related. Hence the use of the t test.

$t = \frac{r\sqrt{n-k}}{\sqrt{1-r^2}}$ where k = numbers of parameter which is $\beta 0$ $\beta 1 = 2$

n = numbers of pairs of values = 10

r = correlation value

$t_{cal} = 0.923 \sqrt{10} - 2 / \sqrt{1 - 0.923^2}$

$t_{cal} = 6.7845$

$t_{tab} = t_{\alpha/2\,(n-k)} = t_{0.025\,8} = 2.312$

Hence t_{cal} (6.7845) $> t_{tab} = 2.312$.

Therefore, there is a significance difference between those that processed staple foods and those that did not processed staple foods. Those people that processed food had income increase than those who did not.

The above analysis indicated that there is income differentials between farmers who processed food further and those who did not.

Objective 4: What are the factors influencing processing or not of these identified staple foods farmers?

Multiple regression analysis was done for two dependent variables, Decision to process farming outputs further and income increase

1. Decision to process farming outputs further.
2. Income increase

Results of the regression results of the factors motivating decision to process farm inputs further and the significant outcome were present in Table 14

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.942	.148		6.383	.000
	Age	.001	.002	.042	.248	.004
	Gender	.014	.047	.029	.305	.761
	Marital Status	-.023	.021	-.102	-1.105	.271
	Family size	-.002	.005	-.059	-.456	.009
	Highest level of education	.014	.016	.095	.897	.001
	Farming experience	.002	.002	.152	1.016	.312
	How do you acquire your present farm	.015	.022	.066	.675	.501
	Cost of agricultural inputs	-6.786E-8	.000	-.007	-.067	.946
	Hired labour cost	-4.966E-7	.000	-.140	-1.388	.007
	Cost of processing machine	1.094E-6	.000	.167	1.906	.059
	Sold outputs revenue	-1.473E-8	.000	-.043	-.464	.643

a. Dependent Variable: Do you process your agricultural outputs

Table 14: Multiple regression estimates for Decision to process farming outputs further

Source: Field Survey, 2017

Dependent variable = Decision to process farm outputs further.

Marginal effect is at the mean value. * 10% significant level. ** 5% significant level. *** 1% significant level. R-squared $R^2 = 0.72$ Durbin Watson DW: 1.963

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	**.465**	**11**	**.042**	**1.025**	**.428[a]**
	Residual	5.278	128	.041		
	Total	5.743	139			

a. Predictors: (Constant), Cost of farming inputs, Marital Status, Highest level of education, Cost of processing machine, Hired labour cost, Gender, How do you acquire your present farm, Family size, Cost of agricultural inputs, Farming experience, Age

b. Dependent Variable: Do you process your agricultural outputs.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	25874.805	55888.228		.463	.644
Age	-403.098	862.013	-.010	-.468	.641
Gender	14894.053	17320.584	.011	.860	.392
Marital Status	12192.806	7688.377	.019	1.586	.115
Family size	1482.441	1797.377	.014	.825	.411
Highest level of education	-165.053	6060.551	.000	-.027	.978
Farming experience	-257.976	585.366	-.008	-.441	.660
How do you acquire your present farm	-2336.053	8092.693	-.004	-.289	.773
Cost of agricultural inputs	-2.195	.375	-.084	-5.860	.000
Hired labour cost	-1.698	.140	-.166	-12.115	.000
Cost of processing machine	-1.436	.216	-.075	-6.640	.000
Sold outputs revenue	1.003	.012	1.035	85.499	.000
Product processed	-29195.189	9446.013	-.041	-3.091	.002

Table 15: Multiple regression estimates for Profit and Loss Account as a result of processing

Source: Field Survey, 2017

Dependent variable = Profit and loss account.

Marginal effect is at the mean value. * 10% significant level. ** 5% significant level. *** 1% significant level. R-squared $R^2 = 0.74$ Durbin Watson DW: 1.96

ANOVA TABLE

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.598E13	12	3.832E12	697.734	.000[a]
	Residual	6.645E11	121	5.492E9		
	Total	4.664E13	133			

a. Predictors: (Constant), Product processed, Age, Cost of processing machine, Marital Status, How do you acquire your present farm, Gender, Sold outputs revenue, Hired labour cost, Highest level of education, Cost of agricultural inputs, Family size, Farming experience

b. Dependent Variable: Profit and Loss account

The multiple regression model was conducted to investigate factors that influence farmers' decision to processed farm outputs further and income increase and estimated via ordinary last square method estimation technique. Tables 14 and 15 presents the estimated results of the regression model. Overall the multiple regression model successfully predicts the possibility of farmers' decision to processed farm outputs further (72%) and income increase (74%). This suggests that 72 and 74 per cent of the explanatory variables explained the dependent variables (that is farmers' decision to processed farm outputs further and income increase engaging) respectively. Based on the estimated results, 6 variables are found to have significant influence

on farmers' farmers' decision to processed farm outputs further and 5 variables are found to have significant influence on income increase. These are family size, years of education, farming experience, agricultural practices, and sources of finance and cost of farming inputs respectively. The significant positive signs on years of education and farming experience variables can be explained from the perspective of capital requirement. Fairly literate farmers tend to have more investment opportunities, influencing the decision to process farm outputs thus leading to stronger potential need for worthwhile adoption of credible and effective farming operations. In addition, this category of farmers may also be more confident in increasing income as they cultivate more lands for agricultural purposes and hence process farm outputs beyond.

This relationship is expected because farmers with formal education (for example, secondary or post-secondary school) are likely to have more exposure to the external environment including risks and possess more skills. They therefore might require more income earning potentials for improving farm sizes and/or production, compared to uneducated farmers who did not processed farm outputs. In contrast, a significant but negative relationship is found between variable family size and farmers' accessibility to land for agricultural purposes, suggesting that the larger-size households are less likely to engage in processing farm outputs further thus, prefer to sell farm outputs at the farm gates. This is possibly because larger-size households tend to provide more hands for labour activities on such various land for agricultural purposes.

The estimated coefficients of variables agricultural practices and sources of fund are all negative and significantly different from zero at the one per cent level for regression of profit and loss model. Holding other factors constant, form of agricultural practices adopted have a significantly

lower probability to improve income compared to those that adopted effective land management practices and good management programme in their farming operations. In addition, sources of fund could decrease the likelihood of engaging in the decision to process farm outputs further, this is because most credit were sourced from friends and family, fund from these sources were inadequate and untimely thus making used of credit not effective. Furthermore, the availability of other credit sources (such as informal credit) also tends to reduce the probability of engaging in effective uses of land for agricultural purposes.

Finally, the estimated coefficient of cost of farming inputs is positive, implying that the farmers that uses relevant and timely farming operation and also adopting good management programme in farming are likely to further farm outputs and hence generate more income. One possible explanation for this unexpected relationship is that households with higher family size and dependency ratios have fewer family members taking up income-generating activities and thus are more inclined not to process farm outputs further and prefer to sell farm outputs at the farm gate. The marginal effects are also calculated for the regressors of the multiple regression model to provide a direct economic interpretation on the influence of these variables on decision to process farm outputs and income increase. For example, the marginal effect of family size indicates that an additional member increase in the family would decrease the probability of decision to process farm outputs and income increase by 2.36% on average. In addition, the probability of engaging in effective agricultural practices would increase by 0.55% with every 1% increase in dependent ratio.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

Past studies have indicated that Nigeria's economy is predominantly agricultural, which implies that a large proportion of the populace derive their livelihoods from crop production, fishing and forestry. This is shown in the economy of Ekiti State of Nigeria which is predominantly agricultural. This implies that a large number of the populace derived their livelihoods from agricultural and related activities. Hence, the socio-economy variables results revealed that the modal age range is Above 60 years with an average household head of 55 years. Moreover, 18.6% of the households fall between household sizes 7-9 with mean of 9.34. **Sex and Marital Status analysis results revealed that** 80.0% are married while the remaining 13.6 % are widowed or divorced/separated.

The causal relationship between profit earned or losses as a result of farmers engaging in food processing and experience indicated that those farmers that made losses were 37.9% out of which 15.1% were in the category of farmers who did not processed farm outputs further. In addition, 28.6% made over N150,000 naira. This category of farmers who made such amounts did processed farm outputs. The relationship between years of experience in food processing and profit earned revealed a decisive link. The higher the experience, the higher the farm profit. This finding thus confirms that value addition of food processing is significant. Moreover, education in the study indicated those that attended tertiary institution (like, polytechnic, colleges of education, University among others) are in modal class of 43.0%. This suggests a fairly literate populace thus, suggests that most households' heads will recognize opportunities for earning an

extra income for the household upkeep. Moreover, cross tab revealed that 31% of farmers who took decision to process farm outputs further had tertiary education as against 1% of category of farmers who had similar education took decision not to process farm outputs further. Hence, this findings supports past studies that education influences opportunities to add value to farm outputs and for earning an extra income.

The proportion of farmers that engages in processing of these staple foods revealed that 95.7% of the respondents process their farm outputs out which cassava processing took 43.6%. Also Rice took 26.4% and both cassava and rice took 25.7% respectively. Knowledge of processing the agricultural produce, availability of processing machine and to attract more gain are some of the factors that motivates food processing. Moreover, the cross tabulation analysis of food processors and none food processors in terms of profit/loss generation revealed that 34.3% of those who processed their farm inputs made N100, 000.00 and above annually as against 11% of farmers who did not processed. In addition, farmers who did not processes and accounted for losses are 4.3%. This evidence suggest that value addition is a significant factors to income increase and welfare improvement among food processors in Ekiti State.

The study examined income of those category of farmers who processed foods as against those who did not, in addition too, the study evaluated the significance difference between farmers who processed food as against who did not. Hence, this helps to provide answer to the hypothesis of the study. Evidence from the study revealed that 25% of those farmers that processed food made significant profit between ₦200, 001 – ₦750000 as against zero profit for farmers who did not processed food further test was carried out using t-test statistics to test whether there is a

significant difference from those that processed food and those who did not and the result revealed that there is significance difference between those that processed staple foods and those that did not processed staple foods.

Multiple regression model results on factors that influence farmers' decision to processed farm outputs further and income increase and estimated via ordinary least square method estimation technique revealed that farmers' decision to processed farm outputs further (72%) and income increase (74%). This suggests that 72 and 74 per cent of the explanatory variables explained the dependent variables (that is farmers' decision to processed farm outputs further and income increase engaging) respectively. Also, 6 variables are found to have significant influence on farmers' farmers' decision to processed farm outputs further and 5 variables are found to have significant influence on income increase. These are family size, years of education, farming experience, agricultural practices, and sources of finance and cost of farming. While, a significant but negative relationship is found between variable family size and farmers' accessibility to land for agricultural purposes, suggesting that the larger-size households are less likely to engage in processing farm outputs further thus, prefer to sell farm outputs at the farm gates. The estimated coefficients of variables agricultural practices and sources of fund are all negative and significantly different from zero at the one per cent level for regression of profit and loss model.

The estimated coefficient of cost of farming inputs is positive, implying that the farmers that uses relevant and timely farming operation and also adopting good management programme in farming are likely to further farm outputs and hence generate more income. The marginal effects

calculated for the regressors provide a direct economic interpretation on the influence of these variables on decision to process farm outputs and income increase.

5.2. CONCLUSIONS

Findings from the study revealed that large number of the populace derived their livelihoods from agricultural and related activities. Modal age range is Above 60 years with an average household head of 55 years. Moreover, 18.6% of the households fall between household sizes 7-9 with mean of 9.34. The causal relationship between profit earned or losses as a result of farmers engaging in food processing and experience indicated that those farmers that made losses were 37.9% out of which 15.1% were in the category of farmers who did not processed farm outputs further. Farmers who made significant revenue did processed farm outputs. The higher the experience, the higher the farm profit. This findings thus confirms that value addition of food processing is significant. Moreover, cross tab revealed that 31% of farmers who took decision to process farm outputs further had tertiary education as against 1% of category of farmers who had similar education took decision not to process farm outputs further. Hence, this findings supports past studies that education influences opportunities to add value to farm outputs and for earning an extra income.

The proportion of farmers that engages in processing of these staple foods revealed that 95.7% of the respondents process their farm outputs out which cassava processing took 43.6%. Knowledge of processing the agricultural produce, availability of processing machine and to attract more gain are some of the factors that motivates food processing. Moreover, the cross tabulation analysis of food processors and none food processors in terms of profit/loss generation revealed that 34.3% of those who processed their farm inputs made N100, 000.00 and above annually as against 11% of farmers who did not processed. Evidence from the study revealed that 25% of those farmers that processed food made significant profit between as against zero profit for

farmers who did not processed. T-test statistics also testified that there is a significant difference from those that processed food and those who did not. This evidence suggest that value addition is a significant factors to income increase and welfare improvement among food processors in Ekiti State.

Factors that influences decisions to processed farm outputs further and income increase are predicted by multiple regression model results and estimated via ordinary last square method, 6 variables are found to have significant influence on farmers' farmers' decision to processed farm outputs further and 5 variables are found to have significant influence on income increase. These are family size, years of education, farming experience, agricultural practices, and sources of finance and cost of farming. While, a significant but negative relationship is found between variable family size and farmers' accessibility to land for agricultural purposes, suggesting that the larger-size households are less likely to engage in processing farm outputs further thus, prefer to sell farm outputs at the farm gates.

5.3 RECOMMENDATON

Based on the finding of this study, the following recommendations are made;

- Government should formulate and implement economically viable food processing centres that will accommodate food processors.
- Participation in the cooperative farming has been identified as a good source of fund for small famers and thus should be encouraged.
- The study identified that value addition indeed has a significant influence income increase policies to encourage and motivate value addition among food farmers be put in place.

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APPENDIX

QUESTIONAIRE

FEDERAL UNIVERSITY OYE-EKITI EKITI STATE NIGERIA, DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION.

RESEARCH QUESTION FOR FARMERS

PROJECT TOPIC: **Economic analysis of staple food processing of rice and cassava in Irepodun/Ifelodun and Ikole Local Government Areas of Ekiti State.**

NOTE: This question is designed to obtain information for academic research purpose only. It will be appreciated if the under listed questions are answered honestly and to the best of our knowledge.

INSTRUCTION: Please tick appropriate.

SECTION A (SOCIO-ECONOMIC CHARACTERISTICS)

SECTION 1

1. Age.....
2. Gender? (a) male (b) female
3. Marital status:

   (a) Married ( ) (b) Single ( ) (c) Divorced ( ) (d) Separated ( )

4. Family size?

   1. No of wives.....
   11. No of children.....
   111. No of dependent.....

   Total = ...

5. Highest level of education attained?

   (a) No formal education ( ) (b) Primary education ( )

   (c) Secondary education ( ) (d) Post-secondary education ( )

   (e) Tertiary education ( )

6. Years of schooling.....

7. What was your aim of agric. Production/processing activities (check one)

   a. To feed my family and myself

   b. To feed my family and myself and if possible have some for sale

   c. To exchange excess product for other goods

   d. To make profit through farming and processing

   e. To have large surpluses for sale and make huge profit

8a. Farming experience.....years

8b. How long have you been working on your present farm.....years

9. This farm you have been working for such a long time? Yes.....No.....

   If No, can you tell us years years of experience in your old farm.....years

   Also, reason for leaving the old farm for the present farm

   (You can choose more than one option)

   (a) The old farm is becoming smaller

   (b) It is a rented farm and the owner of the farm want to use it

   (c) Can no longer pay rent on the farm

   (d) Problem of soil fertility

   (e) Others (please specify)

   .....

.....

10. How do you acquire your present farm

(i) Inherited

(ii) Family land

(iii) Purchased land

(iv) Rented/leasehold land

(v) Others (please specify)

.....

.....

11. How many of such land do you use for agricultural purposes

(a) 1 ( ) (b) 2 ( ) (c) 3 ( ) (d) 4 ( ) (e) 5 ( )

(f) more than 5 ( )

12. Land number and agricultural activities

Land	Agricultural practices	Types of crops grown	Types of animal and number raised.	Years of cultivation
1				
2				
3				
4				
5				

13. Can you outline reason(s) why do you have many lands for agricultural activities

(a) Availability of land for agricultural purposes

(b) Proximity of the land to markets and inputs

(c) Financial reason

(d) Demand for output for such crops

(e) Others

SECTION 2

14. Type of crops engaged on

(a) Rice ( )

(b) Cassava ( )

(c) All of the above ( )

15. What factors influences your decisions to cultivate the above crops. (multiple choice is allowed)

(a) Access to resources/input

(b) Ready market to absorb the product

(c) Easy cultivation and harvest

(d) Others(kindly indicate).....

.....

16a. Do you process your product

(a) Yes ( ) Cassava ( )

(b) No ( ) Rice ( )

Cassava and Rice ( )

16b. Why do you process the items listed in 16a (kindly choose).

(a) Availability of processing machine

(b) Knowledge of processing the items

(c) To add value of quality

(d) To attract more gain

(e) Market access

(f) Others (kingly say).....

.....

16c. If No, can you tell us why you do not process further

(a) Lack of funds

(b) Poor access market

(c) Farm gate sales more encouragement

(d) Others (kindly indicate).....

.....

SECTION 3 **(INCOME DIFFERENTIALS)**

Input	Amount (N)	Mode of acquisition (Creditor (C) or Own savings (O)
Labour (Man-days)		
Hired		
Family		
Farm tools/Equipment		
Planting materials		
Improved seed		
Fertilizer		
Agric-chemicals		
Processing machine		
(1)		
(2)		
(3)		
(4)		
Credit obtained on processing machine		
(a) fun banks		
(b) crop		
(c) micro finance		
(d) others		

Other, specify		
Total		

17. Estimate the total amount spent on farm input

18. Volume of your output

Value of produce	Bags/kg	Amounts/kg	Total (₦)
(a) Consumed at home			
(b) Sold			
(c) Payment for hired labour			
(d) Wasted			
(e) Other uses (seed, animal feed)			
Total			

19. Could you kindly give the factors contributing to/accounting for wastage in15(d)above.....

20. What are your sources of finance (a) personal saving( ) (b) loan ( )

(c) cooperative/esusu ( ) (d) community bank ( ) (e) commercial bank ( )

(f) sales agents ( ) (g) other, specify.....

21. Does your incomes increases/decreasing as a result of your action in question 23

(a) Yes ( ) (b) No ( )

SECTION 4 **(FACTORS RESPONSIBLE FOR INCOME DIFFERENTIALS)**

22. Assurance of market is responsible for your income proceeds

(a) Yes ( ) (b) No ( )

23. What factors responsible for income proceeds

(a) Ready made markets ( )

(b) Access to market channels ( )

(c) Government support in the provision on inputs and market assurance ( )

(d) Others (please indicate).....

.....

SECTION 5: **(General question)**

24. Apart from farming, what other occupation do you engaged in (a) Trading of manufactured goods ( ) (b) Civil service ( ) (c) Artisan ( ) (d) Others, specify.....

25. Do yo have access to agricultural extension services? Yes/No. If Yes it:-(check one).

(a) Regular ( )

(b) Not regular ( ).

(c) Once in a year ( )

26. Do you have access to credit facilities? Yes.....No.....

If yes, source of the credit (a) Friends (b) Banks (c) Cooperative (d) Others (please indicate).....

27. Kindly state the problems encountered on your farms.....

.....

28. Other suggested solutions to the above problems.....