ECONOMIC ANALYSIS OF GROUNDNUT PROCESSING (OIL AND CAKE) AND IT'S EFFECTS ON POVERTY LEVEL OF THE PROCESSORS IN ZAMFARA STATE, NIGERIA

BY

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Processing of agricultural products is generally accepted as the efficient method of maintaining the shelf-life of produce. Such processed products provide local foods for consumption among the rural population (Zuberu *et al.,* 2013). Hence, the importance of crop processing industries especially in Nigeria cannot be over emphasized. The crop processing industry of Nigeria like other African countries is dominated by the informal sector comprising mainly of small and medium scale rural enterprises owned and operated by men and women who depend solely on indigenous technology (Aseidu, 2009). Groundnut, soya beans, banana, palm kernel, potatoes, cassava, *et cetra* were some of the dominant agricultural produce that are processed into local foods consumed by the rural communities in Nigeria (Napodo and Ditto, 2013).

Groundnut is one of the most valuable legume crops of Nigeria and other tropical countries with 25 percent protein and more than 40% oil. Nigeria is a major producer of groundnuts accounting for 25 percent of world exports (IFPRI, 2012). In 2004 the country had 3500 hectares cultivated and production of 2750 tonnes (NBS, 2013). Groundnut accounted for 70% of total Nigeria export prior to petroleum oil boom (World Geography of Peanut, 2013). Groundnut is widely consumed in Nigeria as roasted or boiled nuts in the Western and Southern parts of the country (Adebesin *et al.,* 2011).

Groundnut has contributed immensely to the development of the Nigerian economy in general and employment generation among the rural groundnut farmers and processors in particular. Also, they are important in the confectionary trade among the rural traders and the stable oil from groundnut is preferred by the deep-frying industries since it has a smoke

point of 229.4^{o}C compared to 193.5^{o}C of soybean oil. The oil is also used to make margarine and mayonnaise (Hulme and Mosley, 1996). Confectionary products such as snack nuts, sauce, flour, peanut butter and cookies are made from high quality nuts of the crop.

Groundnut plays an important role in the diets of rural populations, particularly children, because of its high contents of protein and carbohydrate. It is also rich in calcium, potassium, phosphorus, magnesium and vitamin E. Groundnut meal, a by-product of oil extraction, is an important ingredient in livestock feed. Groundnut haulms are nutritious and widely used for feeding livestock. The groundnut oil is composed of mixed glycerides, and contain a high proportion of unsaturated fatty acids, in particular Oleic (50-56%) and Linoleic (18-30%) (Young, 1996).

Nigeria was the third highest producer of groundnut in the world after China and India with a production of 16,114,231, 6,933,000 and 2,962,760 tons respectively in 2011. In Nigeria, the crop is presently grown throughout the country with the exception of the riverine and swampy areas. The leading producing states in Nigeria include Niger, Kano, Jigawa, Zamfara, Kebbi, Sokoto, Katsina, Kaduna, Adamawa, Yobe, Borno, Taraba, Plateau, Nasarawa, Bauchi, and Gombe States (Yusuf, 2008).

In the Northern part of Nigeria, apart from being consumed raw, edible groundnuts are processed into many local foods or included as an ingredient in a wide range of other products which includes groundnut paste which is fried to obtain groundnut cake (*kuli kuli*), salted groundnut (*gyada mai gishiri*), a gruel or porridge made with millet and groundnut (*kunun gyada*), groundnut candy (*kantun gyada*) and groundnut soup (*miyar gyada*). The shells are used for fuel by some local oil factories or they are sometimes spread on the field

as a soil amendment. They could also be used as bulk in livestock rations or in making chipboard for use in joinery (Mukhtar, 2009).

In Zamfara State, in particular, some of the processed local foods from groundnut include Nigeria groundnut cake called '*kulikuli'*, groundnut oil (*mangyada*), groundnut pap (*kunun-gyada*), salted groundnut (*gyada mai gishiri), et cetra*. The root could also be processed in a variety of ways, like roasting, baking, boiling, frying or drying for flour while the seeds can be substituted for beans or lentile in soups and stews (Brian, 2009).

Groundnut cake is a popular local food consumed even by both the urban and the rural population in Zamfara State. However, despite the importance of groundnut oil and cake processing ventures in employment generation and poverty reduction among the rural population in Zamfara State, there was paucity of information about their impacts on the poverty level of the processors in the State. In order to close this gap, this research focused on the processing of groundnut into groundnut cake *(Kulikuli*) and groundnut oil (*mangyada*) in Zamfara State. The impact on the poverty level of the processors as well as the defects associated with the processing methods were investigated and analyzed.

1.2 Problem Statement

The groundnut cake and oil known as '*Kulikuli*'and *mangyda* respectively in *Hausa* language contained about 40-50% protein and is a valuable feed mainly for poultry. It is also used in preparing groundnut soup. Groundnut flour produced from the cake can also be used for enriching tuber flours such as cassava flour which is low in protein (Aseidu, 2009).

Groundnut cake is a popular local food consumed by the rural population in Zamfara State in addition to groundnut oil. However, despite the importance of groundnut oil and groundnut cake processing ventures in employment generation and poverty reduction among

the rural population in Zamfara State, previous studies have not focused on the economic analysis of the impact of groundnut processing on poverty alleviation among the processors, whereas, economic returns of groundnut processing depends on wealth the of processors, costs and the price of groundnuts. Previous researches on groundnut processing in Zamfara State have focused on the marketing system, financing and roles in rural development (Ugwu, 2009).

This information gap in the previous studies necessitates this research to assess the economic impact of groundnut processing on the poverty level of the processors with special focus on the processing of groundnut into groundnut cake *(kuli kuli*) and groundnut oil (*mangyada*) in Zamfara State, Nigeria. In a quest to ascertain the economic impact of the groundnut processing on the poverty level of the processors in the study area, the following research questions were raised:

(i) What are the socio-economic characteristics of the groundnut processing entrepreneurs?

(ii) What are the profitability levels of groundnut cake and groundnut oil processing firms?

(iii) What are the economic and allocative efficiencies of groundnut processing firms?

(iv) What are the determinants of allocative and economic efficiencies of groundnut processing firms?

(v) What are the impacts of groundnut cake (*kuli kuli*) and groundnut oil (*mangyada*) processing firms on poverty alleviation among the processors?

(vi) What are the constraints militating against the groundnut cake (*kuli kuli*) and groundnut oil (*mangyada*) processing ventures in the attainment of their goals?

1.3 Objectives of the Study

The broad objective of the research is an economic analysis of groundnut processing and its impact on poverty level of the processors in Zamfara State. The specific objectives are to:

(i) describes the socio-economic characteristics of the groundnut processing entrepreneurs;

(ii) estimates the profitability of groundnut oil (*mangyada*) and groundnut cake (*kuli kuli*) processing firms;

(iii) determines the economic and allocative efficiency of groundnut processing firms;

(iv) identify the socio-economic determinants of allocative and economic efficiency of groundnut processing firms;

(v) examines the effect of groundnut oil (*mangyada*) and groundnut cake (*kuli kuli*) processing firms on poverty alleviation among the processors; and

(vi) describes the constraints militating against the groundnut oil (*mangyada*) and groundnut cake (*kuli kuli*) processing firms in the attainment of their goals.

1.4 Research Hypotheses

The following null hypotheses were tested:

(i) The socio-economic characteristics of the groundnut processing entrepreneurs do not influence the economic and allocative efficiencies of the processors in Zamfara State.

(ii) The groundnut oil and groundnut cake processing have no impact on poverty levels of the processors in Zamfara State.

(iii) The groundnut oil and groundnut cake processing in the study area are not profitable ventures.

1.5 Justification for the Study

In view of increasing concerns about poverty and unemployment, especially among low-income categories in Nigeria, the need for investments in the small-scale sub-sector becomes necessary (Oregwu, 2013). There is evidence that employment in small rural enterprises often exceeds that in large urban industrial firms. The empirical evidence available for more recent periods indicated that on the aggregate, rural industrial and other nonfarm employments and outputs have been increasing, rather than decreasing, with development (Chuta and Liedholm, 1989).

Groundnut, an important oil seed crop, provides significant sources of cash through the sales of seed, cakes, oil and haulms. Groundnut plays an important role in the diets of rural populations. Groundnut production and processing is one of the major activities of the rural people in Zamfara State. Hence it is a source of livelihood for many people such as groundnut processors, groundnut farmers, marketers, transporters, etc. transformation of groundnut industry through processing would enhance the overall economic development through the income and employment generation in the rural economy of Zamfara State.

Generating information on efficient method of groundnut processing helps in alleviating the problems encountered by the processors as well as improves their standard of living. Such data on groundnut processing provide information on the profitability and efficiency of the enterprise and guides the processors on whether or not to embark on groundnut processing investments.

The output of this research is significant in guiding the policy makers, directing the government towards effective food production and revamping the agricultural sector with specific emphasis on groundnut processing. It is expected that the findings of this research

will provide feedback to researchers such as The Institutes for Agricultural Research (IAR) Samaru, Zaria, National Agricultural Extension and Research Liaison Services (NAERLS) and International Crop Research Institutes for Semi-Arid Tropics (ICRISAT). In addition the findings from the study will contribute to increasing literature on agricultural processing in Nigeria and the world over.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Groundnut (*Arachis Hypogeal)* Production

Groundnut (Arachis Hypogeal) originated from South America, but is now widely cultivated throughout the tropical, sub-tropical and temperate countries, and in Africa, Asia, North and South America. Optimum mean daily temperature to good growth is 300^0C and growth ceases at 150^0C and cool temperature delay flowering (Asongwa, Ihemeje ,and Ezihe, 2011). Between 500-600mm of water reasonably distributed through the growing season allows a good production. Groundnut does well on sandy–loam soil, with pH range of 5-7 and soil should be rich in calcium and phosphorus which are essential for pod formation. It has the bunch, erect and creeping type (Ayozie, 2009). The popular varieties in Nigeria are kano local, kano 50, Castle- cary, Samnut 21, 22, and 23 (rosette resistant varieties). Groundnut can be a sole crop or intercropped. It performs better as sole crop. Groundnut is an important oilseed and food crop for millions of people in the semi-arid tropics. It generates employment on the farm during cultivation and in agro-processing (CGIAR, 2009). It is the 13th most important food crop of the world and the 4th most important source of edible oil. Its seeds contain high quality edible oil (50%), easily digestible protein (25%) and carbohydrates (20%) (FAO, 2004). As such, it is an essential food product that enjoys good patronage in both the domestic and international market as a veritable source of edible oil, animal feed and also consumed as snacks (Nnamdi, 2010).

Africa accounts for 38% of global groundnut area and 25% of production. Nigeria is a major producer of groundnuts accounting for 25% of world exports (IFPRI, 2012). In 2004 the country had 3500 hectares cultivated and production of 2750 tonnes (NBS, 2013). Groundnut accounted for 70% of total Nigeria export prior to petroleum oil boom (World

Geography of Peanut, 2013). Groundnut is widely consumed in Nigeria as roasted or boiled nuts in the Western and Southern parts of the country (Adebesin *et al*., 2011).

In Nigeria, the processing of groundnut into various products is done mostly by women either for home consumption or for commercial purposes (Ibrahim *et al*., 2005). The most common commercial products of groundnut are: groundnut oil, groundnut cake and fried peanuts which are sold at market places or hawked on the streets, (Ihekoronye and Ngoddy, 1985). In Zamfara State, the participation of women in groundnut production had been acknowledged by several authors. Women are involved in planting, weeding, harvesting, processing, storage and marketing. Women farmers are resource poor and illiterate groundnut producers, they partake in all aspects of the groundnut value chain. They own farms through their husbands or inheritance for their groundnut production (Ranjha *et al*., 2009).They work to acquire basic necessities such as food, clothing and shelter, through groundnut production.

Limitations in groundnut production ranges from land availability, labour, fund, availability of appropriate fertilizer dosage, disease control, post harvest challenges, proper storage to marketing. In the past several technologies have been introduced to the farmers to enhance their performance and these have impacted positively on productivity. On the other hand, there are some locations in Zamfara State that were not been captured during dissemination of groundnut technologies for increased return on production and to effectively utilize the potential of this crop (Onugu, 2005).

Therefore to up-scale production to meet increasing interest in groundnut for industrial revolution, emphasis should be placed on the relationship between farmers' socio economic, demographic and institutional variable on the adoption of certified seeds, use of insecticides,

storage techniques and timely harvest. It is imperative to access the effectiveness and adoption of groundnut production technologies information packages among farmers in Zamfara state. In addition, it is imperative to understand the factors that could be improved to ensure increased production among women farmers in Zamfara State. The objectives of this study are to determine the socio economic and demographic variables of groundnut farmers in Zamfara State. Attempts were made to determine the economic viability of groundnut production technologies among farmers, and the allocative efficiency of groundnut production technologies among farmers in Zamfara State (Simonya *et al.,* 2011).

2.2 Concept of Processing

Processing is defined as any activity that maintained or raises the quality or alters the physical and/or chemical characteristics of a product, material, object *et cetra.* Processing can be simple and quick or complicated. Many farm products must be processed before they can be used as intended, this include groundnut cake and oil. Many agricultural products are perishable and only available for short period of time (Diamond and Williams, 1993).

Processing extends the season for which they are available. Processing operation may be carried out continuously or intermittently. Processing helps to provide more varied and higher quality meals, reduces waste in the food preparation process and stabilizes costs through portion control. Processing brings about significant cost saving (Collins, 1988). These cost savings can be in the form of a discount in the commercial price or by way of a refund from the processor. Processing is now an integral part of day-to-day service operation (USDA, 2009).

2.2.1 Processing of groundnut

Groundnut processing is basically the transformation of the primary agricultural products (raw groundnut) into other finished commodities like groundnut oil, cake and animal feed among others. Processing of groundnut perhaps is the best area an investor can engage in with maximum utilization of the product (Olomola, 2004). The milling of the product would yield edible oil which can be refined to get vegetable oil and groundnut cake which is a valuable input in the preparation of animal feed and as such can be sold to animal feed millers. Therefore, groundnut processing can lead to reduction in food wastage, enhanced food security, improvement in livelihood of low income (Oluwatayo, *et al.,* 2008).

In Zamfara State, ground-nut is grown by the small farmers and processed in different ways into different local foods and products. The process produced a roasted Nigeria groundnut cake called *'kulikuli'*. Also, there are two parts of groundnut that are edible, including roots and the seeds. The root can be processed in a variety of ways, like roasting, baking, boiling, frying or drying for flour. The small seeds can be substituted for beans or lentile in soups and stews (Brian, 2009).

However, the results of studies presented by Azizah and Zaimon (2007) suggested that roasting leads to reduction in Insoluble Dietary Fibre (IDF) and Total Dietary Fibre (TDF), informed that toasting enhances the flavour and the taste of the food in infant formulation. It also said that toasting leads to improved digestibility and reduction in formulate food.

The toasting of groundnut with sugar and honey is a new addition just over a decade ago in the northern Nigeria of which Zamfara, the research study area, is a part. It requires little capital for production. However its acceptance by the adult class is still in a low ebb because of some undesirable qualities found in the products. These defects were highlighted and processing methods to prevent their occurrence investigated.

2.2.2 Processing of groundnut into groundnut cake (*Kuli kuli*)

Kuli kuli is a Northern Nigerian snack that is made from dry roasted groundnuts, grinded into a semi-paste, mixed with select spices and deep fried until it hardens.

Ingridients for *Kuli kuli*

- Dry roasted groundnuts.
- Grated Ginger.
- Pinches of grinded Chilli pepper(optional)
- Groundnut oil, for frying.

***Kuli kuli* Making Process**

- Grind or Pound the roasted groundnuts and ginger, by using a dry mill or mortar, until smooth. Little oil is sometimes added to the mill/blender to easy grinding. However, care must be taken in order not to allow it turn completely to paste.
- Next, squeeze the groundnut paste to remove as much oil as possible (this step is very important in producing a very crunchy *kuli kuli).*Therefore in getting the crunchiest *kuli kuli*, squeezing out as much oil out of the paste,as possible is very essential.
- Mold the paste into any shape of choice: circular shape, flat shape, elongated/spindle shape, *et cetra*. Little water can be added to help it mold easily).
- Now heat about 4 cm deep of groundnut oil in a frying pan or pot, until the oil begins to smoke. Few slices of onion or cloves can be added to the oil to give it some extra flavor.

- Add the molded groundnut paste to the oil and fry until golden brown. Remove from the oil, leave to cool completely.



Plate 1: Sample Groundnut Cake ('*Kuli kuli*' in Hausa dialect): Nigerian (Hausa) Snack balls

2.2.3 Groundnut oil production in Nigeria

Ground nut seed contains 50 - 55% of oil. The oil obtained from the kernel is yellow to greenish yellow in colour with chief constituents of glycerides of oleic and linoleic acids with lesser amounts of the glycerides of palmitic, stearic, arachidic, behenic, and lignoceric acid. The oil is used as a substitute for olive oil and other edible oils, soaps, salad and cooking oil, mayonnaise and margarine. The meal is an important component of feeds for poultry and cattle (Ogujuiba *et al.*, 2004).

Ground nut oil is used for cooking food. The Country's requirement of ground nut oil is met through import and domestic production. However, the market is quite dominated by imports.

In 2000 to 2014 the highest share that could be achieved by domestic manufacturers was 26% with an average of around 11% for the same period. Despite availability of raw

materials like ground nut, linseed, nigger seed, sesame, rapeseed, cotton seed in the country, packed edible oil of foreign sources are flooding the market (see Table 2.1).

Table 2.1: Supply of Edible Oil (Tonnes)

Year	**Domestic production**	**Imports**	**Total**
2000	6,579	70,789	77,368
2002	6,637	24,785	31,422
2004	8,329	34,196	42,525
2006	7,999	22,283	30,276
2008	8,027	121,812	129,839
2010	6,931	82,014	88,945
2012	4,882	69,473	74,355
2014	8,329	34,196	42,525
Average	7,054 (11%)	60,764 (89%)	67,818

Percentage shares: Domestic production = 26 %; Imports = 74%
Source: Customs Authority for import, CSA, Statistical Abstract for Domestic Production, 2015.

Table 2.1 reveals that domestic production of edible oil was fluctuating around a mean figure of 7054 tonnes. On the other hand import of edible oil has shown a substantial increase during the recent years. The import level which was in the range of 22,283 tonnes and 34,196 tonnes during the year 2002-2004 has increased to 121,812 tonnes, 82,2014 tonnes and 69,473 tonnes during 2008 , 2010 and 2014 , respectively.

Total apparent consumption (local and imported), during the past fourteen years ranged from 30,276 tonnes (2006) to 129,839 tonnes (2008). The mean apparent consumption in those years was 67,818 tonnes and this amount is considered to represent effective demand for the year 2014. Moreover, in order to estimate the present (2015) demand it is assumed that demand for the product grows at a rate of 4% which is equivalent to the growth of population.

Accordingly, taking the year 2014 apparent consumption as a base and applying a growth rate of 4% the current unsatisfied demand which excludes local production is estimated at 65,722 tonnes.

2.2.4 Groundnut oil processing and technology used

To produce groundnut oil, the principal raw material required for the production is ground nut seeds, which are produced locally in different parts of Zamfara State. All the other raw materials are also found locally. Groundnut with pedigree to produce oil are then procured and brought to the local factory. The technology for processing can be grouped into two: manual pressing/extraction and mechanical pressing. For the manual method, the procured nuts are sorted out and cleaned, roasted, grinded into viscous liquid-form before being fed locally into the mutter. An elongated pestle or stick is then used to turn and compress to extract the oil. The extracted oil is then refined through the process of filtration and heating. The end product is then collected and packaged in the desired containers. The procured nuts could also be sorted, cleaned and fed into mechanical machine for extraction (Odedokun, 1998).

Ground nut oil production process, based on mechanical pressing technology, can be grouped into three stages: seed preparation, pressing and crude oil refining. The seed

requires undergoing a thorough cleaning process to remove sand, stalk, plant debris and any other foreign matters by rotary or table sieve. Usually, the screening process is assisted by air aspiration unit. After cleaning, the seeds have to be prepared for efficient oil recovery by pressing. The stages involved are size reduction of the seeds by breaking them and then conditioning the seeds by adjusting their moisture content and temperature, while keeping the seeds hot (say 90 -95ºc) for a period of 30-60 minute. Then the prepared seed shall be conveyed to the screw pressing machine where it is pressed by the action of warm and outer shell (Makinde and Fayomi, 2008).

However, the used of mechanical extraction method is not very popular among local producers in the study area. Establishment of this project involves feasibility study preparation, procurement and installation of machines in the appropriate accommodation, recruitment of personnel and project commercial take-off.

2.2.5 Groundnut processing, poverty reduction and economic growth in Nigeria

Several studies have focused on understanding the association between groundnut processing, poverty reduction and economic growth, yet there are some disagreements. However, the relationship between the groundnut processing sectors and other sectors should not be a competition but rather be viewed as interdependent where supply and demand in sectors can be accommodated through strengthened linkages (Blum, 1995). For instance, industry is an important sector and every economy that strives for development should work toward strengthening its industries (Levi, 2000).

Nonetheless, the position of groundnut processing sector in the strive for industrialization should not be ignored as the case has been in Nigeria. As argued by advocates of agriculture-led growth (ALG), development of the processing sector is a prerequisite for

industrialization through increase in rural incomes and provision of industrial raw materials, provision of a domestic market for industry and above all the release of resources to support the industry (Schultz, 1964; Timmer, 2004). Neglect of the agricultural processing sector in favour of the industrial sector will only lead to slow economic growth and inequality in income distribution. Therefore, despite the fact that processing of agricultural produce may be unable to single-handedly transform an economy, it is a necessary and sufficient condition in kick-starting industrialization in the early stages of development (Byerlee *et al.,* 2005).

The contributions of groundnut processing ventures to economic growth can be examined through the roles of the sector in the economy. Johnston and Mellor (1961) summarized these roles in five inter-sectoral linkages; food, labour, market, domestic savings and foreign exchange. The most basic of these roles is, perhaps the supply of food for both domestic consumption and export. Direct contributions of food production can be through income generated from sales of farm produce and returns from economic activities related to production; or indirectly from increased capacity to partake in any form of economic activity through improved diet. Anyawu *et al.* (2010) using correlation matrix find that production of major staples in Nigeria contributed significantly to GDP growth (except wheat) between 1990 and 2001. Also, as observed by Timmer (1995) the agriculture sector contributes to economic growth through provision of better caloric intake and food availability. The attainment of global food security and reduction of hunger hinges largely on this singular role.

According to Food and Agriculture Organization (FAO) (2005), agriculture can facilitate the attainment of all 8 MDGs through the direct or indirect linkages to food availability and poverty reduction. In 2008, UNDP reported that the 12.6% reduction recorded in the

proportion of underweight children between 1990 and 2008 can be attributed largely to growth in the agriculture sector in Nigeria (UNDP, 2008).

Furthermore, as population increases, failure to increase food supply in proportion to increased demand has negative effects on industrial profits, investment and economic growth (Johnston and Mellor, 1961). Hazell and Roell (1983) asserted that in the early stages of development, rising incomes of rural/farming households is essential to providing market for domestically produced goods and services via strengthened purchasing power. The most direct contribution of agriculture to economic growth, according to Irz (2001), is increase in incomes of farmers and therefore their purchasing power. Results of several studies, including Gallup (1997), Irz (2001) and Thirtle (2001) showed that an increase in agriculture growth results in an increase in the income level of the poorest of the population. Also results from cross-country regressions among developing countries show that $1 increase in GDP results in significantly more poverty reduction when the growth is in agriculture rather than other sectors (Lipton, 2012). This sectoral growth increases the incomes and therefore purchasing power of farmers resulting in a vibrant domestic market for other sectors, hence growth in the economy.

An offshoot of income growth is increased domestic savings, both at micro and macro levels as observed in developed economies like Japan, Taiwan, South Korea, Hong Kong and recently, China (Harbaugh, 2004). Agriculture therefore contributes to economic growth by increasing the incomes of majority of the population thereby strengthening their saving capacity. Results from an IFPRI publication on Ethiopia's growth and transformation plan shows that increased domestic savings is imperative to the achievement of higher Total Productivity (GTP) (Engida *et al.,* 2011). Using Tobit regression model on multi-stage data from Kwara state, Nigeria, Obayelu (2012) finds that domestic saving is low among rural

dwellers/farmers in Nigeria. He highlights the effect of high expenditure on food, which is a consequence of low income due to low productivity, on saving capacities of the farming households in the study. This implies that domestic savings largely influences the growth path of the economy.

2.2.6 An overview of the concept of poverty

A concise and universally accepted definition of poverty is elusive largely because it affects many aspects of the human conditions, including physical, moral and psychological. Different criteria have, therefore, been used to conceptualize poverty (Adeyeye and Ajakaiye, 1987). Most analyses follow the conventional view of poverty as a result of insufficient income for securing basic goods and services. Others view poverty, in part, as a function of education, health, life expectancy, child mortality etc. Blackwood and Lynch (1994) identified the poor, using the criteria of the levels of consumption and expenditure.

Further, Sen (1983) related poverty to entitlements which are taken to be the various bundles of goods and services over which one has command, taking into cognisance the means by which such goods are acquired (for example, Money and Coupons etc) and the availability of the needed goods. Yet, other experts see poverty in very broad terms, such as being unable to meet "basic needs" (physical; (food, health care, education, shelter etc. and non – physical; participation, identity, etc) requirements for a meaningful life (World Bank, 1996). Poverty may arise from changes in average income or changes in the distribution of income.

It is generally agreed that in conceptualizing poverty, low income or low consumption is its symptom. This has been used for the construction of poverty lines. Various theories have been advanced in order to put in proper perspective the mechanics of poverty. The orthodox Western views of poverty, reflected in the "Vicious circle" hypothesis stating that a poor

person is poor because he is poor, and may remain poor, unless the person's income level increases significantly enough to pull the person in question out of the poverty trap (Johnston and Mellor, 1961). To the classical school of thought, such improvement can only be real and sustained, if and only if, the population growth is checked and the "limits of growth" are eliminated. Further, the early classical theorists in the attempt to illuminate on the concept of poverty based their analytical framework on the laws of diminishing returns which was believed to be universal in content although this was later upgraded at the time of Alfred Marshall and his contemporaries when the law of increasing returns in industry was more clearly articulated (Levi, 2000).

2.2.7 Dimension of poverty in Nigeria

The incidence of poverty in Nigeria has generally been on the rise since 1980, with two significant dips during 1985- 1992 and 1996-2004. Focusing on the most recent surveys (1996 and 2014), the national poverty incidence was 65.6 percent in 1996 and declined to 54.4 percent in 2004 and rises to about 71 percent in 2014 (Ajakaiye, 2014). Similarly, in 1996, the poverty depth (P1) and poverty severity (P2) were 0.358 and 0.207, but these decreased respectively to 0.225 and 0.122 in 2004 (IFPRI, 2014). Estimates of inequality also indicate that Nigeria has more unequal distribution of income than Ethiopia, Madagascar, India, and Niger. Further analysis also suggests that poverty in Nigeria is predominantly a rural phenomenon, with rural poverty increasing from 28.3 percent in 1980 to 63.8 percent in 2004. However, the proportion of the urban poor also rose from 17.2 percent in 1980 to 54.1 percent in 2004 and 71.6 percent in 2014.

Thus, within rural areas approximately 44.4 percent of households in 2004 could not meet their food expenditure requirements. Another 19.4 percent could meet their food expenditure requirements, but not the minimum expenditure to cover other basic needs (NBS, 2007). In

the case of urban households, 26.7 percent were not able to meet their required food expenditure requirements while 16.4 percent could meet their food expenditure but not other non-food basic expenditure needs (Ajakaiye, 2014).

The predominance of rural poverty over urban has been consistent during 1996 to 2004. In 1996, about 70 percent of rural households were poor, as compared with 58 percent of the urban households. In 2004, the incidence of urban poverty declined more rapidly than rural poverty with 64 percent of rural households being poor (a 6 percent decrease) while urban poverty decreased by 15 percent to 43 percent. The same pattern holds true for the other poverty indices (depth and severity). It is important to note that the incidence, depth and severity of poverty among rural households are higher than the national poverty figures, while those of the urban households are lower (Foster, 1984).

The North West, North East and North Central zones have the highest poverty incidence, depth and severity in descending order while the South West, South East, and South-South have the lowest poverty incidence, depth and severity in ascending order. All zones witnessed reductions in their poverty measures (incidence, depth and severity) from 1996 to 2004 except the North West where poverty incidence increased from 72.7 percent to 76.4 percent. The reductions in the poverty incidence, depth, and severity for rural households in the southern zones are greater than those achieved by their northern counterparts. Hence, it could be concluded that poverty is more prevalent in the northern zones than in the southern zones (Akanngbe, 2011).

2.2.8 Dimension of poverty in Zamfara State

In terms of poverty, Zamfara is one of the States of the federation with poverty rate above 70 percent. At the end of 2012, the poverty rate in the state was 70.8 percent. The Sokoto

State remained the poorest state in the country, with 81.2 per cent poverty rate (NBS, 2014). According to the information, other states with over 70 per cent poverty rate include Katsina, 74.5 per cent; Adamawa, 74.2 per cent; Gombe, 74.2 per cent; Jigawa, 74.1 per cent; Plateau, 74.1 per cent; Ebonyi, 73.6 per cent; Bauchi, 73 per cent; and Kebbi, 72 per cent (NBS, 2014).

The state with the lowest poverty rate was Niger with 33.8 per cent, followed by Osun with 37.9 per cent and Ondo, 45.7 per cent. Others with less than 50 per cent poverty rate were Bayelsa State, 47 per cent and Lagos State, 48.6 per cent (NBS, 2014).

The average poverty rate of the states in the North -West geopolitical zone remained the highest at 71.4 per cent followed by North-East 69.1 per cent and North Central, 60.7 per cent. The record showed that poverty was least prevalent in the South-West, with an average of 49.8 per cent, followed by South-South, 55.5 per cent and South-East, 59.5 per cent.

According to National Bureau of Statistics (NBS) (2014) national unemployment rate stood at 23.9 per cent at the beginning of 2012. There were no figures for 2011 but the 2012 statistics represented an improvement in the figures released by the bureau for 2010. For unemployment rate, Zamfara State had the highest rate of 42.6 per cent, followed by Bauchi, 41.4 per cent. Other states with above 30 per cent unemployment rate included, Gombe, 38.7 per cent; Nassarawa, 36.5 per cent; Jigawa, 35.9 per cent; Edo, 35.2 per cent; Adamawa, 33.8 per cent and Kaduna, 30.3 per cent. According to the records, unemployment was least in Osun followed by Kwara and Lagos (NBS, 2014).

2.2.9 Causes of rural Poverty in Nigeria

According to Adeyeye and Ajakaiye (1989) there is no one cause or determinant of poverty. On the contrary, combinations of several complex factors contribute to poverty. They include low or negative economic growth, inappropriate macroeconomic policies, deficiencies in the labour market resulting in limited job growth, low productivity and low wages in the informal sector, and a lag in human resource development. Other factors which have contributed to a decline in living standards and are structural causes or determinants of poverty include increase in crime and violence, environmental degradation, retrenchment of workers, a fall in the real value of safety nets, and changes in family structures. These are examined below:

(i) Low economic growth performance: Growth of the economy is a must for poverty reduction. In developing countries such as Nigeria growth that is employment generating and with export base is desirable in order to achieve growth that is poverty reducing with equity. Although the economic performance of countries in the World has generally been highly volatile since the early 1980s, on the whole, growth rates have been low or negative, with overall declines in several countries. This is due in part to external shocks such as adverse changes in several country's terms of trade, changes in global demand for exports and changes in global interest rates on developing countries external debt. All these are probably responsible for the increase in poverty level in various countries of the world. Extensive evidence links the importance of economic growth to poverty reduction (World Bank 2010). For example, in Indonesia and Thailand poverty was reduced by between 30 and 40 percent during a twenty-year period in which annual growth rates were approximately 3 percent (investments in the social sectors also contributed).

Accordingly, of a sample of countries, those that reduced poverty the least (for example,

India and Sri Lanka) had growth rates of less than 1 percent. Growth can reduce poverty through rising employment, increased labour productivity and higher real wages it generates (World Bank, 2010).

(ii) Macroeconomic shocks and policy failure: This has been a major cause of poverty in several countries of the world. As many economies in the world faced macroeconomic disequilibrium, mostly in the balance of payments due to expansive aggregate demand policies, terms-of-trade shocks, and natural disasters, it become necessary to undertake major policy reforms. In the process such economies became vulnerable to poverty (Falconer, 1990).

Macro-economic shocks and policy failure account for poverty largely because they constrain the poor from using their greatest asset "labour". Also, monetary policies that adversely affect cost and access to credit by the poor, fiscal policy which results in retrenchment, lay-off and factor Substitution; exchange rate policy which raises the domestic cost of production in an import dependent production system will affect the poor negatively. However, an exchange rate policy which boosts exports particularly those in which the poor are predominantly engaged (for example agriculture) will help reduce poverty. The urban poor, as a result of policy failure, are vulnerable to job losses resulting from job-cut-backs in the public sectors or from the decline of industries adversely affected by shifts in relative prices. They also lose from the removal of food subsidies and other welfare packages. Further, devaluation produce both negative and positive effects on equity and poverty incidence. On the negative side higher production costs of import, especially in import dependent economy usually result in declining capacity utilization rate in manufacturing and lay –off and retrenchment in the private sector all worsening poverty (Dasgupta, 1993).

(iii) Labour markets deficiencies: The poor's most abundant resource is their labour, a verilel labour market is important to reducing poverty and income inequality. In most countries of the world the majority of poor households participate in the labour market in one way or another, and thus poverty is a problem of low wages (in the informal sector), low labour returns to rural self-employment activities, underemployment, and in some cases, protracted unemployment. These problems are affected in different ways by deficiencies in labour market. The majority of the labour force work as paid employees in the private informal sector, followed by employees in the public sector. When there are deficiencies in labour market, the poor are affected by limited job growth and absorption capacity in the formal sector. Also, relatively high labour costs in the formal sector that lead to over expansion of a low-productivity informal sector, thus putting downward pressure on wages in the informal sector (where many of the poor work), and limited opportunities for unskilled youth to acquire job training and skills can perpetuate a cycle of poverty (WHO, 2004).

(iv) Migration: Migration rates do reduce poverty especially when the majority of individuals who migrate are skilled workers. On the other hand, individuals who emigrate vacate jobs in labour markets. Thus, migration drains on skills. It reduces the pace of economic growth and thus slows the process of overall job creation and affects the long-run development potential in a country.

(v) Unemployment and underemployment: Employment is a key determinant of poverty.

Gainful employment is important for individual to earn income and escape from "income" poverty. While generally in countries of the world the non poor suffer from transitional or involuntary unemployment, the poor are faced with problems of structural unemployment due to lack of skills or extremely low educational levels, medical problems, geographical isolation (which affects some of the rural poor in general and the urban poor due to marginalization of persons living in high- crime neighborhood) and in some countries, discrimination based on race or other attributes. Further, underemployment occurs largely in the informal sectors and results in low incomes for an important segment of the labour force, particularly in rural areas (Seyoum, 1998). Unemployment is due to low economic growth than to the direct effects of imperfections in the labour market, although regulations affecting the formal sector are likely to induce more underemployment in the informal sector. In poorer, rural areas, this mainly takes the form of seasonal unemployment and in urban areas those who have given up searching for work. High unemployment particularly affects youths, women urban dwellers, and those "queuing" for good jobs in the formal sector (Bifarin, 2011).

(vi) Human resource development: This is key for human capital development and capability to escape from poverty. Continued investment in human capital with improvements in efficiency is necessary to sustain reduction in poverty changes in the labour market. Investment in people can boost the living standards of households by expanding opportunities, raising productivity, attracting capital investment, and increasing earning power: In addition, providing additional educational opportunities for adolescents may prevent some youths from becoming involved with gangs, drugs and violence, given the evidence linking the perpetrators of crime with school dropouts (Tanko and Opara, 2009).

(vii) Health/diseases. Good health is basic to human welfare and a fundamental objective of social and economic development. Poor health shackles human capital, reduces returns to learning , impedes entrepreneurial activities and holds back growth and economic development. Diseases cause poverty and vice versa. In most countries of the World major diseases causing poverty are Malaria, HIV/AIDS and other infections/diseases. In Nigeria for instance, AIDS prevalence is about 5.4% with an infected adult population of 2.6 million. This will constrain availability and participation of this segment of the population in the labour market to earn income (Ugwu, 2009).

(viii) Debt burden: In several developing countries of the world, debt burden is assuming increasing importance as a cause of poverty. In such countries servicing of the debt has encroached on the volume of resources needed for socio-economic development. The productive sector such as agriculture, manufacturing etc are equally constrained leading to low productivity, low capacity utilization, under employment and low purchasing power thereby subjecting the masses of the people to abject poverty. In Nigeria, at the end of December 2000 external debt stood at US$28.5 (about 80% of GDP). Amount required to service this debt annually is enough to hamper government expenditure for the provision of social and physical infrastructure for the poor (Zuberu *et al.*, 2013).

(ix) Governance: The persistence and pervasiveness of poverty in several countries has been linked to the lack of popular participation in governance and decision- marking as well as weak institutional base. This has led among other things to poor accountability, transparency in resource allocation, weak programme implementation and monitoring. Ultimately, development programmes are rendered ineffective poverty reduction initiatives are therefore ineffective and resources wasted (Weir and Knight, 2000).

(x) Environmental Degradation: Environmental degradation is a cause of accentuated poverty. At the same time, poverty itself can be a cause of environmental degradation.

This reverse causality stems from the fact that for poor people in poor countries such as Nigeria, a number of environmental resources are complementary in production and consumption to other goods and services while a number of environmental resources supplement income most especially in time of acute economic stress (Falconer and Arnold, 1989, Falconer 1990). This can be a source of cumulative causations, where poverty, high fertility rates and environmental degradation feed upon one another. In fact, an erosion of the environmental resource base can make certain categories of people destitute even when the economy on the average grows (Dasgupta, 1993).

In several countries of the world inaccessibility of the poor to credit and resource inputs leave them with no choice order than to employ natural resources such as forests, woodlands and rivers in order to survive. Quite often, their continuous exploitation of these resources have led to stress/depletion and environmental degradation thereby making poor both agents and victims of unsatisfactory ecological practices. In most rural areas, developing countries fallow duration has declined to four to five years and in several instances as low as two years. Short fallow period is usually not adequate for regeneration of vegetation and the restoration of host nutrients; soil and water quality are therefore quickly depleted. Among the poor; frequent cutting of forest trees with low replanting rate has resulted in scarcity of fuel wood. Immediate effect of this is that poor households turn to alternative fuels such as crop residues, coconut husks, rice hulls or elephant grass. The smoke from these inferior fuels according to Cece Laki (1985), is often more poisonous than that of fuel wood, while emissions from all biomass fuels are known to be dangerous sources of air pollution in the house. Also, scarcity of fuel woods forces women to make what is available burn slowly. WHO (2004) reckons that under slow burning conditions wood fuels are capable of

producing pollution concentrates higher than fossil fuels and subject the households to more smoke pollutants.

The incessant cutting down of trees for firewood and charcoal have hindered prospect for increased yield and hasten the prospect of the creeping desert while profligate use of the country's resources by industries and industrial pollution from improper waste disposal has further exacerbated the plight of the poor. Other consequences of over exploitation of environment due to poverty are depletion of fish in the local rivers and streams.

(xi) Crime and Violence: A steady increase in crime and violence has degraded the quality of life to a varying extent in many counties of the world. Although individuals of all socioeconomic groups are affected, the urban poor are particularly vulnerable to these social problems. There are instances of shootings, gang killings, etc. Crime and Violence have serious economic costs. For instance, an increasing proportion of public resources, which is limited, is required to strengthen police enforcement, support the growing prison population, finance the demands place on the judicial system, and provide health care for persons injured by violence (Yususf, 2008). Other costs include the expensive security systems and guards now required by businesses and homes, the loss in potential revenues from foreign investor and tourists who have sought other destination as a result of the threat of crime, and the migration of the urban middle class. Because of the heterogeneous nature of the poor, it is difficult to link poverty, crime and violence directly. However the adverse social consequence of crime have been closely associated with poverty e.g loss of lives at productive age and quantum loss of properties (Udoh, 2008).

2.2.10 General approach for reducing poverty

Almost half the world's people (some 2.8 billion) live on less than $2 a day, and a fifth (some 1.2 billion) live on less than $1 a day. This horrific level of poverty persists despite unprecedented but unevenly distributed increases in global wealth in the past century. Over the past 40 years the gap between rich and poor has doubled, with income in the richest 20 countries now averaging 37 times that in the poorest 20 (World Bank, 2000).

The bank's new strategy builds on the experience of the past decade in proposing a broader approach to fighting poverty. The three-pronged approach focuses on increasing opportunities for poor people, facilitating their empowerment and enhancing their security.
In spite of the challenges confronting small -and medium -scale enterprises in Nigeria, government realized the role of SMEs as the catalyst for poverty eradication and economic growth through employment, and their contribution to macro-economic development. (Omolola, 2008). Government in the past has established various support institutions agencies and reliefs measures aimed at enhancing and improving the capacity of SMEs. Example of these includes specialized banks such as Bank of Industry (BOI), to offer investment credits and loans to improve the investment capacity of SMEs.

The establishment of Bank of Industry (BOI), small and medium scale enterprises development agencies of Nigeria (SMEDAN), the facilitation of small and medium scale industries equity investment scheme (SMIEIS) and other employment generation and poverty alleviation scheme such as National Economic Empowerment and Development strategies (NEEDS), at national level, State level and Local Government level,, were all signs of prosperity in the live of SMEs in Nigeria. As Onugu (2005) put it the economic reform programme would aid the creation and consolidation of existing small and medium scale enterprises because of its focus on income generating opportunities for the people. (Onugu, 2005). Similarly, Omolola (2008) views the current effort of government since

1999 towards revamping SMEs as a sustainable process capable of building the prospect of small and medium scale enterprises and a path to national recovery of the Nigerian ailing economy.

While lauding government effort, the organized private sector is also making a vital contribution in this direction. As Onugu (2005) observed, the capital market, driven by the Nigerian stock exchange (NSE) and the security and exchange commission (SEC) has not only been expanding its facilities for small and medium scale enterprises to access funds from the market.

At the international front, the globalization and current economic reforms which has liberalization, commercialization and privatization as its main components has also opened up vista for the SMEs and entrepreneurs. The liberalization of trade through world trade agreement has opened up opportunities to SMEs to access international markets. The African Growth Opportunity Act also offers incentives to exporters from African countries to the United State of America. (Onugu 2005; Omolola, 2008).

Faced with the unprecedented poverty level, the Nigerian Federal Government developed some programmes towards poverty alleviation between 1990 and 2010. These programmes include:

(i) National Directorate of Employment (NDE)

Decree number 24 of October 19, 1986 established this Directorate, which commenced operation in January 1987 with the primary role of promoting skill acquisition, self-employment and labour intensive work schemes. It also collects and maintains a data bank on unemployment and vacancies in the country. It has been concerning itself with designing

of employment programmes such as school leaver apprentice scheme, entrepreneurs training programmes for graduates, labour-based work programmes, and resettlement of trained beneficiaries. The NDE has trained more than 2 million unemployed Nigerians, provided business training for not less than 400.000 people, vocational training in up to 90 different trades, assistance to more than 40,000 unemployed to set up their own businesses. The Directorate has organized labour based groups through which 160,000 people benefited.

The NDE suffers from inadequate funding from the Federal Government. Its predicament is worsened by the fact that is has over stretched itself by engaging in skills acquisition, granting of loans, procuring and selling agricultural inputs such as fertilizers. It has succeeded in recovering less than 10% of its loans. There is also the problem of duplication of efforts with the statutory roles of the Federal Ministry of Labour and Productivity in the area of compilation of statistics on the unemployed in the country and claims to maintain a data bank of these as well as matching applicants with vacancies.

Despite all the problems enumerated above, the NDE possesses great potentials as an agency for the promotion of skill acquisition and self-employment schemes, given its widespread presence and over 15 years relative experience in the design and execution of employment generating programmes.

(ii) Peoples Bank of Nigeria (PBN)

Decree No. 22 of 1990 established the PBN which commenced business in October, 1989. It was charged with the responsibility of extending credit to under-privileged Nigerians who could not ordinarily access such loans from the orthodox banking system. Before it was merged with the Nigerian Agriculture and Cooperative Bank (NACB) to form the Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB), the PBN was merged

in group lending to cottage industry promoters, agricultural producers, NGOs and cooperative societies. It disbursed up to ₦1.7 billion as in-house loans from funds derived from the Federal Government, with which it provided support for over 1 million new businesses, with a net saving of about 1 billion Naria. It also disbursed No. 9 billion as loans from funds provided by the Family Economic Advancement Programme (FEAP).

The bank had a high degree of problem loan. Its external audit report showed a huge loss provision of over 80% on its loan portfolio at its close. Some of its funds were also trapped in distressed and liquidated banks due to unwise investment decisions.

(iii) Nigerian Agricultural and Cooperative Bank (NACB)

This bank, which started operations on March 6, 1973 was established by Decree No. 19 of November 1972. it had responsibility for providing credit for the production, processing, and marketing agricultural produce. Its target groups included individual farmers, cooperative organizations, limited liability companies, states and federal government. Before its merger with the PBN in 2001, the bank had extended credit to 318,000 to the tune of about ₦5.8 billion.

The bank's statutes, which restricted it from taking deposits from the public was a hindrance to it. It had other problems including its inability to charge market interest rates and high cost of credit administration, huge portfolio of non-performing loans, funds trapped in distressed and liquidated banks etc.

(iv) National Board for Community Banks (NBCB)

The National Board for Community Banks is a regulatory body set by Decree No. 46 of 1992, but it started operations in December 1990 with the main purpose of supervising the

operations of Community Banks in the country. There are about 1000 Community Banks under the purview of the NBCB. The Community Banks are private sector owned micro – credit banking institutions promoted by the federal government to inculcate savings culture, disciplined banking habit as well as encourage economic development at the grass-root level. These banks are allowed to operate normal banking business except in certain areas such as foreign exchange dealings, direct participation in the clearing system, etc.

The NBCB has encouraged rural banking. It also helped in mobilizing about ₦4.4 billion deposits for the Community Banks nationwide granting of ₦2.58 billion loans by Community Banks which have staff strength of about 12,000 people nation-wide. Current, the Board is having problems, including having no clearing house specifically for the Community Banks who have to go through correspondent banks at a cost, non-issuance of final licenses by the CBN, non-inclusion of Community Banks' deposits under the Nigeria Deposit Insurance Corporation's deposit insurance scheme, under-capitalization of the Community of the Community Banks and government's under-funding of the NBCB.

(v) National Commission for Mass Literacy, Adult and Non-Formal Education (NCMLAE)

The functions of the Commission, which came into being through Decree No. 17 of 1990 include establishing links, in cooperation with all stakeholders, to eradicate illiteracy in the country, designing and promoting strategies and programmes for the conduct and implementation of a national mass literacy campaign in concert with relevant government institutions and NGOs. Similarly, it was to organized in-service professional training courses for senior staff from government and capacity building. The Universal Basic Education (UBA) has since submitted the Commission and its programmes.

(vi) Family Economic Advancement Programme (FEAP)

This programme was established to provide credit for agricultural production and processing, cottage and small-scale industries through cooperative societies; to encourage the design and manufacture of plants, machinery and equipment; and to establish enterprises and pilot projects at village level as a means of providing employment – as provided for in its enabling Decree No. 11 of August 12, 1997 and as amended by Decree 47 of May 10, 1999, Before it was wound up in 2000, FEAP financed 20,382 projects with a total credit of ₦3.33 billion, trained about 2000 loan beneficiaries in cooperative laws, principles and practice and financial management and basic marketing skills.

The programme has problems including the non-supervision and monitoring of the loans and project by the participating banks, fabricators connivance with the beneficiaries to inflate cost of equipment, provision of sub-standard equipment and delays in the fabrication, and poor loan recovery. The programme's assets and liability were handed over to the National Poverty Eradication Programme (NAPEP).

2.3 Empirical Review on Socio-economic Characteristics of Groundnut Processors

Socio-economic variables of processors have been found to have substantial impact on groundnut cake and oil processing. Involvement of middle aged processors could result in a positive effect on production while large family size guarantee free and cheap labour. Education and experience are measure of human capital and they reflect the ability to implement technology. Hence education is expected to increase technology adoption and output of the processors. Oluyele and Sanusi (2009) stated that education is a good pointer to improved productivity as the level of education is a tool with which an individual could be efficient at whatever endeavour being undertaken by the individual.

Ekine and Onu (2008) reported that in their study in River State, mean age of sample processors was 56 years. Education plays an important role in groundnut processing operations since it facilitate the adoption of innovations that improve groundnut processing. Their study revealed that over 95 percent of the respondents had formal education in one level or the other and that the most prominent system of labour requirement is family.

The level of awareness and adoption of modern methods of groundnut processing are affected by the literacy status of the processors. Those who are literate are expected to be more innovative because of their ability to get information more quickly and their ability to take more risk. Studies by Oluwatayo *et al*. (2008) on resource use efficiency of maize processors in rural Nigeria revealed that the more educated an entrepreneur is, the more the chances that he/she will adopt innovations than the uneducated ones. Therefore there is high probability that the groundnut processors in the study area will easily adopt new groundnut processing practices since about 84.1 % of them are educated.

2.4 Empirical Review on Profitability of Groundnut Processing

Profit-making is generally accepted as a major objective of a business. There are several different ways to look at the profitability of a business activity. The particular type of analysis to be done will vary with the time frame selected, the scale of activity being selected, and the availability of data to do the analysis (Engle and Neira, 2005). Profit is a major viability of any business. It is the difference between the value of goods produced and the cost of resources used in their production. The amount of revenue realized and the operating costs of a business enterprise determined how much gain or loss an enterprise can achieve within a certain period. However, the determination of the processor's margin or return is difficult in small-scale groundnut processing ventures since they have several objectives including their consumption needs.

Ekine and Onu (2008) revealed that the quantity and amount of revenue realized by processing firms are usually under estimated mainly due to inadequate recording and improper accounting procedures. The level of gross margin of small-scale groundnut processing firms is influenced by many determining factors including costs of groundnut, costs of equipments, price of labour and availability of labour. These determinants are essential because the survival of a small-scale processing enterprise depends on them.

2.5 Empirical Review on Economic and Allocative Efficiencies of Groundnut Processing Firms

Efficiency is often cited as an indicator or measure of competitiveness. It is a measure of the distance from a given observation to the frontier. Firms operating on the frontier are said to be fully efficient in their use of inputs and those operating beneath it are inefficient. This notion of inefficiency referred to the neoclassical efficient allocation of resources and the pareto optimality criterion (Latruffe, 2010). In order to ascertain whether resources were efficiently utilized in sorghum farming, Muhammed *et al* (2011) used the marginal value product (MVP) of the variable inputs to compute and compared input prices in order to determine the efficiency of the inputs used. It was reported that seeds, fertilizer and other inputs were under-utilized.

The efficiency of a system means the ratio between the works or energy got out of it and the work or energy put into it (Dave, 2012). In order to assess farm efficiency in production economics, two observation behavior of the operators can be modeled depending on the research question and data availability. First, operators theoretically behave as a profit-maximizer or cost-minimizer when choosing the optimal bundle for the farming process. Second the time horizon influences how many variables the producer can control. When the

operator is planning for long run, all inputs and outputs can be varied. On the contrary when the time horizon is limited, the operator can choose to vary only some of the inputs referred to as variable inputs. Other production factors referred to as fixed inputs cannot be changed in this time horizon.

The concept of efficiency is concern with the relative performance of the processes used in transforming given inputs into outputs. The problem of measuring the productive efficiency of an industry is important to both the economic theorists and economic policy makers. Economic theory identified at least three types of efficiency. These are technical, allocative and economic efficiencies. Allocative efficiency referred to the choice of optimum combination inputs consistent with the relative factor prices. Technical efficiency shows the ability of firms to employ the best practice in an industry, so that no more than the necessary amount of a given set of inputs is used in producing the best level of output. Economic efficiency is the product of technical and allocative efficiencies (Bifarin *et al,* 2010).

The two most popular methods of measuring efficiency assuming the presence of inefficiency effect in the production system are data envelopment analysis (DEA) and the stochastic production frontier method. DEA is a non-parametric method while the stochastic frontier is a parametric method. Coelli (1995) compared the two methods and concluded that the main strengths of the stochastic frontier approach are its ability to deal with stochastic noises and the incorporation of statistical hypothesis tests pertaining to production structure and the degree of inefficiency.

2.6 Empirical Review on the Application of Stochastic Frontier in Efficiency Studies

Fleming and Coelli (1995) assessed the performance of a nucleous estate and small holder scheme for groundnut processing in West Sumatra, using stochastic frontier production

function in measuring their technical efficiency. Their results indicate a mean technical efficiency and the use of female labour, suggesting there is no need to target extension services especially at female labourers in the household. Finally, education was found to have an unexpected negative impact on technical efficiency, indicating that farmers with primary education may be more important than those with secondary and tertiary education as targets of development schemes and extension programs entailing non-formal education.

Piesse and Thirtle (2006) fitted the translog stochastic frontiers with inefficiency effects to a panel of Hungarian firm level for agricultural enterprises and light manufacturing sector during the early transition period (1985-1991). Their findings revealed that labour and materials make salient contribution to output while energy and capital do not, whereas the cross section estimates show that relative efficiency improved sufficiently in agriculture and industry that in the later years the average production function is preferred to the stochastic frontier except when manufacturing efficiency collapsed in 1991. The inefficiencies were explained by over capitalization, subsidies and excessive management, while firms that had established export markets were more efficient.

Tchale (2009) in his study on the efficiency of smallholder agriculture in Malawi, used the stochastic frontier in his analysis and discovered that fertilizer and land are the key factors in the production of the major crops grown by the majority of smallholder farmers. Labour is also key variable, especially among farmers who grow labour intensive crops within the maize-based smallholder farming system. The average levels of technical, allocative and economic efficiency were estimated at 53%, 46%, and 38% respectively. The results generally highlight the relative inefficiency that characterizes smallholder agriculture in Malawi. The results further indicate that allocative inefficiency is worse than technical

inefficiency, which implies that the low level of overall economic efficiency is the result of higher cost inefficiency.

In the work of Seyoun *et al.* (1998) they applied the Cobb-Douglas stochastic frontier production function in investigating the technical efficiency of two sample of maize producers in Ethiopia, one involving farmers within the Sasakawa-Global 2000 project and the other involving farmers outside this program. The empirical results indicate that farmers within the SG-2000 project were more technically efficient than farmers outside the project relative to their respective technologies. The mean frontier output of maize for farmers within the SG-2000 project was significantly greater than that for farmers outside the project.

Research conducted on technical efficiency differentials in rice production technologies in Nigeria by Ogundele and Okoruwa (2006) showed that the use of some critical inputs such as Fertilizer and herbicide by the farmers were found to be below recommended quantity per hectare. Applying stochastic frontier analysis revealed that there was also significant difference in the use of such inputs as labour between the two groups of farmers. Other variables that tend to contribute to technical efficiency were hired labour, herbicide and seeds, while fertilizer was found not to have contributed significantly to technical efficiency, the estimated technical efficiencies for the two groups were correspondingly high (0.90), which indicate that there is little opportunity for increase efficiency given the present state of technology. The test of hypothesis on the differentials in technical efficiency between the two groups of farmers showed that there was no absolute differential.

A study carried out to investigate technical inefficiency of production among the food crop farmers of the National Directorate of Employment in Ondo State of Nigeria, by Ajibefun

and Abdulkadri (1999) considers translog stochastic frontier production functions in which the technical inefficiency effects are defined by three different sub models. Given the specifications of the stochastic frontier production function, the null hypothesis, that the frontier is adequately represented by the Cobb-Douglas function, was accepted but the null hypothesis that the farmers are fully technically efficient, which implies that inefficiency effects are absent from the model, was rejected. Further, the null hypothesis of half-normal distribution for the inefficiency effects was rejected. Predicted technical efficiencies vary widely across farms, ranging between 21.7% and 87.8% and a mean technical efficiency of 67%.

Alabi *et al.* (2010) used the stochastic production function in estimating the technical efficiency in sesame production in Nasarawa Doma Local Government Area of Nasarawa State. The model was estimated by the maximum likelihood method which shows the elasticity of production for seeds (0.51); labour (0.71); capital (0.55) had significant effect on sesame output. The inefficiency model revealed that education and access to credit were significant at 5 percent and positively affects farmer's efficiency level. Also, technical efficiency in cassava-based food crop production system in delta state was studied by chukwudi (2010) using stochastic frontier function; he discovered that 71 and 67 percent of the variations in output is attributed differences in technical inefficiencies. Means technical efficiencies for mixed crop and mono crop farmer were 80 and 71 percent respectively. Level of formal education, contacts with extension agents, farming experiences and capital to labour ratio and credit to total cost ratio had positive effect on efficiency.

In a research conducted by Ogundari *et al.* (2006) to determine economics of scale and cost efficiency in small scale maize production in Nigeria, they observed cost efficiency scores of 1.16 as the mean cost efficiency of the farms. Meaning that, an average maize farm in the

sample area has that are about 16% above the minimum defined by the farms in the words. 16% of their costs are wasted relative to be best practiced farms producing the output (maize) and facing the same technology. All parameters estimate have the expected sign with cost of labour, cost of seed, annual depreciation cost and maize output highly significant different from zero and thus were important in maize production. Bravo-Ureta and pinheiro (1997) reported a mean allocative efficiency of 44% and a mean economic efficiency of 31% in their study of peasant farming in the Dominican republic with the maximum allocative and economic efficiency been 84 and 62%. Paudel and matsuaka (2009) conducted a research on cost efficiency estimates of maize production in Nepal and observed a mean cost efficiency of 63%. Age was found to be positive coefficient, implying that farmers of older age tend to be less cost efficient that is, the decrease in cost efficiency tends to increase with the household head age for maize production in the study area.

Allocative and economic efficiency determined by Bifarin *et al*. (2010) on plantain production in Ondo State, Nigeria; shows a wide difference in the farmers efficiency, with averages of 57% and 35% and a modal clas of (51 – 60%) which had a higher allocative efficiency than the lower class (11 – 20%) because farmers in the modal class had a higher level of formal education, were younger, adhered strictly to the stipulated replanting age and had been in the system for quite aome time. However, none of the respondents had a 100% efficiency index. This implies that resources could be allocated to their best alternative uses and prices could as well be allowed to perform their allocative functions in the use of inputs.

2.7 Review of Groundnut Processing Constraints

Since independence in 1960, Nigeria's agricultural sector has experienced slow output growth that has not kept pace with population increase. This has resulted in declining agricultural exports and domestic food supplies and a growing reliance on imported food as

a result of problems encountered by the sector. The decline in the agricultural sector can be partly explained by drought and serious pest and diseases infestations, though, there are other prominent reasons for its decline, including the neglect of the agricultural sector after the oil boom, and unfavourable government policies which greatly affected the technology generation capacity and technology environment, level of processing and marketing environment and production and coordination machinations between different stages of the sector (Hyman, 1990).

Ugwu (2009) undertook a research to identify problems or constraints with respect to production, processing, storage and marketing of groundnut processing products in Cross River State. He concluded that productivity in Nigeria has not grown sufficiently due largely to under investment in new technology, slow adoption of existing improved technologies, constraints associated with the investment climate, and lagging infrastructure. Others are: unattractive market prices, high cost of palm oil extraction and palm kernel cracking machines, lack of unimproved varieties of oil palm resulting in low output and low quality of products.

According to Ekine and Onu (2008) high cost of processing equipment and independent fund are the serious problems faced by processors in Rivers State. This problem had discouraged intending processors from establishing their own mills. Therefore, majority of the processors in the area resort to hiring of processing equipment and this had resulted to delay in processing of the palm fruits. Those who do not own mills face marketing problems during the peak season when fruit is abundant and processors do not have to forage for raw materials. In Imo State, Nwajiuba and Akinsami (2003) asserted that scarcity of fuel wood and water are the major problems encountered by processors. Ogah (2004) recorded that in Oju Local government Area of Benue State, processors encounter problems such as

unimproved technology, irregular supply of fresh fruit bunch (FFB), nut cracking, transportation, credit/fund, lack of water and unsteady labour supply.

Studies by Soyebo *et al.* (2005) in Ife Central Local Government Area of Osun State reported that 34.2% of processors had fund problem while 53.2% complained of inadequate information and limited knowledge on improved processing methods of oil palm. About 54% of the processors claimed lack of government support on oil palm processing. These constraints faced by the oil palm processors may have contributed to lack of the enterprise.

2.8 Major Constraints Faced by Rural Groundnut Processing Ventures

The constraints militating against groundnut processing in the study area varies from one respondent to another. However, the processors pointed out that inadequate capital for expansion, unstable price of inputs and inadequate processing machines are the three major constraints hindering the processing of groundnut. Other constraints include inadequate labour supply, lack of readily available market, incomplete return of credit sales, low volume of production, unstable Electricity, and lack of processing shed. A similar finding was also made by Haruna *et al.* (2006). The respondents also pointed out that their profit will increase if the constraints can be overcome.

(i) Financial problems

Lack of Finance is a constraint to the growth or expansion of groundnut processing firms in Zamfara State. Empirical evidence shows that adequate financing contributes about 25 percent to the success of groundnut processing firms (Ogujuiba *et al.,* 2004). In Nigeria, most groundnut processing firms are folding up or lack competitiveness because they lack the much required financial capacity to prosecute their manufacturing concern. Most of these groundnut processing firms cannot access loan on a long -and short -term basis. In a

World Bank report in 2001, it was reported that almost 50 percent of micro, 39 percent of small-scale firms (groundnut processing firms included), and 37 percent of medium -scale firms are financially constrained in Nigeria, as opposed to 25 percent of the very large firms (World Bank, 2001). The implication of this is that groundnut processing firms are either discriminated against or cannot access funds at the credit market. In addition to this, the stringent conditions attached to loan and credit also discourages these industries from accessing credit from the credit market. This factor has largely undermined the capacity of groundnut processing firms in Nigeria generally and Zamfara State in particular. While small-scale groundnut processing firms operators have been claiming that banks impose stringent conditions and terms of approval, the Banks on the other hand, have claimed that SME operators don't present bankable projects. Ogujuiba *et al.* (2004) in a report on groundnut processing firms claimed that 20 percent of processing nentures have reported being constrained in receiving long-term loans. This has forced groundnut processing firms to use their internal financing which is usually unsustainable and increases the vulnerability of ventures as a result of low capital base.

(ii) Lack of infrastructural facilities

The performance of groundnut processing has also been hindered by the lack of infrastructural facilities. Inadequate facilities like power supply, telecommunication, accessible road networks and water supply constitute one of the major constraints facing groundnut processing firms. A World Bank study in 1989 estimated that "the cost of providing infrastructural facilities by groundnut processing in the absence of those facilities is estimated to be about 15-20 percent of the cost of establishing manufacturing enterprises in Nigeria. Omolola (2008) contended that the percentage has since increased to 30-35 percent of the cost of establishing manufacturing concerns in Nigeria.

Of the infrastructural problems, the problem of lack of power supply has been the most critical. The erratic power supply has hindered the business environment. In Nigeria, most businesses have folded up or cannot operate as result of irregular and epileptic power supply. The problem of power supply is so bad to the extent that the large industries are now relocating to Ghana and other neighbouring countries, while majority of the small -and medium -scale businesses have since gone into extinction. The implication of this is that it has led to the reduction in production activities. The cost of fuelling generators, machines and equipments has led to cut in employees and increase in running cost of the groundnut processing enterprises. This eventually leads to the folding up of most of these enterprises in Nigeria, since they cannot compete in the market any more.

Most banks have capitalized on this and blamed their inability to fund groundnut processing firms on the poor state of infrastructure, economic climate and low performance of public utilities (Olarenwaju, 2000). However, Chris (2008) of the International Bank in contradiction rejected Banks' excuse on infrastructural facilities, claiming that the huge profits declared by banks' shows that the operating environment is not as bad as they think. The truth however, is that the state of infrastructural facilities in Nigeria is poor.

Where infrastructural facilities are neither present, adequate not functional, the investment environment cannot stimulate improvement for small-and medium-scale enterprises. In these instances, banks would not be willing to invest in groundnut processing because of high risk and the uncertainty of the investment climate.

(iii) Government unfavourable fiscal policy and policy inconsistencies

The inability of government to execute favourable fiscal policy and policy inconsistencies have undermined the capacity of small-and medium-scale processing enterprises. According

to Njoku (2002) inconsistencies in government policies is a major problem affecting groundnut processing enterprises. Ogujuiba (2004) also factored in the problem of inappropriate time or delay in budget implementation as a factor constraining investment and trade decision. In most cases, the process of approving budget at the legislative level is usually delayed due to executive and legislative face-off most times and even when the budget is approved, the executive implementation is very slow, due to administrative bottlenecks. Factors such as these have made the investment environment to be unpredictable and uncertain for small-and medium-scale enterprises. In some cases, high incidences of government regulatory activities, taxes and levies by different levels of government have resulted in high cost of running groundnut processors seem not to be motivated by these factors. As Onugu (2005) posits, this is due to the absence of harmonized and gazzetted tax regime which would enable manufacturers to build in recognized benefit from such policy measures. Instability in government policies has caused some SMEs to collapse. One of such policies is that of the 1980s when government specified that cocoa should not be exported in raw or unprocessed form after a specified deadline. Many processing firms had to import machineries only for government to reverse this policy. The present high mortality rate of groundnut processing firms in Nigeria is awful and constitutes a danger to the entire economic system. It represents serious financial pressure on the nation's economy as well as a waste of valuable resources.

(iv) Internal characteristics and problems.

Most small -and medium -scale enterprises in Nigeria are battling with serious internal problems. These problems range from poor management practices, poor accounting standards, shortage of manpower, financial indiscipline and corruption. The reasons why most groundnut processing firms have not been able to improve are due to poor management knowledge and practices, absence of transparent organizational set up, poor succession plan,

lack of entrepreneurial skills, lack of strategic business plan, et cetera. The dearth of such skills in most groundnut processing firms due to inadequate educational, professional, and technical background on the part of the owners and employees of groundnut processing firms has plunged groundnut processors into further crisis (Oluwatayo, 2008).

It is characteristic of groundnut processing enterprises to ignore basic management procedures and thus run businesses as a family affair by undermining proper book keeping and accounting and managerial practices. Because of the way the business management and accountability measures are ignored, reckless financial administration, wrong investment decision and corruption becomes the order of the day (Omolola, 2004).

(v) Management problems

Lack of trained manpower and management skills also constitute a major challenge to the survival of groundnut processing firms in Nigeria. According to West and Wood (2009) "90% of all these business' failures result from lack of experience and competence". Rogers (2013) also added that inefficiency in overall business management and poor record keeping is also a major feature of most groundnut processing firms. Technical problems and lack of essential and required expertise in production, procurement, maintenance, marketing and finances have always led to funds misapplication and wrong and costly decision making.

(vi) Socio-cultural problems

Most Nigerian entrepreneurs do not have the investment culture of ploughing back profits. Bala (2002) stressed that the attitude of a typical Nigerian entrepreneur is to invest today and reap tomorrow. Also, the socio-political ambitions of some entrepreneurs may lead to the diversion of valuable funds and energy from business to social responsibilities. The problem

of bias against made-in-Nigeria goods is significant. Most Nigerians have developed a high propensity for the consumption of foreign goods against their locally-made substitutes.

(vii) Strategic planning problems

SMEs often do not carry out proper strategic planning in their operations. Ojiako (2013) stated that one problem of groundnut processing firms is lack of strategic planning. Sound planning is a necessary input to a sound decision-making.

CHAPTER THREE

METHODOLOGY

3.1 Description of the Study Area

This study was conducted in Zamfara State, Nigeria. The State is located in the north-western Nigeria. Its capital is Gusau. The State was created on 1st October 1996 and lies in northwestern Nigeria, between latitudes 12^0 10' and 12^0 17N and longitudes $6^0$15' and $6^0$25E. It shares boundaries with Niger Republic, to the east, Katsina, to the west, Sokoto, to the north and Kebbi State, to the south. It occupies a land area of about 39.762 square kilometers which represents about 4.3 percent of the total land area of Nigeria of 923,768 square kilometres. The population of Zamfara State is 3,602,356, according to the 2006 Census, and with population growth rate of 3.5 per annum, it is expected to hit 4,911,016 by 2015 (Onogwu, 2013).

Zamfara has a tropical climate. The rain in Zamfara falls mostly in the winter, with relatively little rain in summer. The koppen-Geiger classification is As. The average annual rainfall is 27.0 ^{o}C in Zamara State. In a year, the average rainfall is 1199 mm. The driest month is January, with 0 mm of rainfall. In September, the precipitation reaches its peak, with an average of 271 mm. the warmest month of the year is April, with an average temperature of 30.5 ^{o}C. August is the coldest month of the year, with an average of 24.9 ^{o}C. The difference in precipitation between the driest month and the wettest month is 271 mm. The variation in annual rainfall is around 5.6 ^{o}C.

Zamfara State is dominated by two major soil types, the ferruginous tropical soils and the lithosols soils. The ferruginous tropical soils can be found in some parts of the State, particularly around Gummi, Bukuyyum, Anka and Bakura. The lithosols soils dominated other areas of the State including Shinkafi, Talata Mafara, Zurmi, Kaura Namoda, Birnin Magaji, et cetera. The soil are characterized by sandy surface region with a clay subsoil both of which are fertile for agricultural production.

The current Zamfara State consists of Hausa and Fulani people with an estimated population of about 4,911,019. Major groups include the Zamfarawa mainly found in Anka, Gumi, Bukkuyum, Talata Mafara, Kaura Namoda, etc. By occupation the inhabitants of zamfara are mainly farmers, however a significant percentage of the population of zamfara are petty, small and medium scale entrepreneurs (Wikipedia, 2010).

In terms of poverty, Zamfara is one of the States of the federation with poverty rate above 70 percent. At the end of 2012, the poverty rate in the state was 70.8 percent. The Sokoto State remained the poorest state in the country, with 81.2 per cent poverty rate (NBS, 2014). According to the information, other states with over 70 per cent poverty rate include

Katsina, 74.5 per cent; Adamawa, 74.2 per cent; Gombe, 74.2 per cent; Jigawa, 74.1 per cent; Plateau, 74.1 per cent; Ebonyi, 73.6 per cent; Bauchi, 73 per cent; and Kebbi, 72 per cent.

The state with the lowest poverty rate was Niger with 33.8 per cent, followed by Osun with 37.9 per cent and Ondo, 45.7 per cent. Others with less than 50 per cent poverty rate were Bayelsa State, 47 per cent and Lagos State, 48.6 per cent (NBS, 2014).

The average poverty rate of the states in the North -West geopolitical zone remained the highest at 71.4 per cent followed by North-East 69.1 per cent and North Central, 60.7 per cent. The record showed that poverty was least prevalent in the South-West, with an average of 49.8 per cent, followed by South-South, 55.5 per cent and South-East, 59.5 per cent.

According to NBS (2014), national unemployment rate stood at 23.9 per cent at the beginning of 2012. There were no figures for 2011 but the 2012 statistics represented an improvement in the figures released by the bureau for 2010. For unemployment rate, Zamfara State had the highest rate of 42.6 per cent, followed by Bauchi, 41.4 per cent. Other states with above 30 per cent unemployment rate included, Gombe, 38.7 per cent; Nassarawa, 36.5 per cent; Jigawa, 35.9 per cent; Edo, 35.2 per cent; Adamawa, 33.8 per cent and Kaduna, 30.3 per cent. According to the records, unemployment was least in Osun followed by Kwara and Lagos (NBS, 2014).

3.2 Sampling Procedure

A survey method using structured questionnaire and informal interview of key informants as well as direct observation of *mangyada*' and *'kulikuli* market situation was used to obtain relevant information for the study. The multi-stage sampling technique was employed in

selecting sampled groundnut cake and oil ventures for the study. At the first stage, Zamfara state, consisting of 14 local government areas, was divided into three zones – north, central and southern zones. The second stage involved purposive selection, from the three geo-political zones, of seven Local Government Areas for the study. Tsafe and Maru were selected from the Central Zone, consisting of a total of four local governments, Kaura Namoda and Zurmi from the North Zone, also consisting of four Local Governments, and finally, Gummi, Anka, and Talata Mafara from the Southern Zone which has a total of six local government Areas. In the third stage, groundnut cake and oil processing ventures were purposively selected from the most groundnut processing wards that cut across the three geo-political zones in the study area. A total of 86 groundnut cake and oil processing firms were selected from the central zone, 88 groundnut cake and oil firms from the northern zone and 86 groundnut oil and cake firms from the southern zone for study. A total number of 260 questionnaires were administered to a total of 260 groundnut oil and cake processing firms that constitute the sample in the study area, but 84 out of 86 questionnaires were properly treated and return from the central zone, 86 out of 88 from the northern zone and 82 out of 86 from the southern zone. Therefore a total of two hundred and fifty two (252) groundnut processing firms whose questionnaires were returned constituted the sample size for the study. The sampling plan is presented in the Table 3.1, Table 3.2, and Table 3.3 below:

Table 3.1: Sampling planned

Table 3.1: Sampling planned

Zamfara-Central Zone

State	Goe-political Zone	Selected Local Government Areas	Selected groundnut cake and oil processing	Sample of groundnut oil and cake processing	Sampled groundnut cake and oil processing

			Areas	Ventures	Ventures
			Tsafe	7	7
			Yandoto	9	8
			Bilbis	10	9
		Tsafe	Keta	4	4
			Kucheri	7	7
			Danjibga	4	4
			Total	**41**	**39**
Zamfara	**Zamfra-central Zone**		Maru	7	7
			Dausadau	7	7
			Mayanchi	7	7
			Jabaka	5	5
			Lugga	3	3
		Mrau	Dankurmi	4	4
			Bindim	3	3
			Matunji	4	4
			Kanoma	5	5
			Total	**45**	**45**
			Aggregate	**86**	**84**

Source: Field survey, 2015

Table 3.2: Zamfara-North Zone

State	Goe-political Zone	Selected Local Government Areas	Selected groundnut cake and oil processing Areas	Sample of groundnut oil and cake processing Ventures	Sampled groundnut cake and oil processing Ventures
			Sabon –Tasha	7	7
			Sabon – gari	8	7
			Kasuwar Daji	7	7
		Kaura Namoda	Kurya	7	7
			Tsohon/Tasha	5	5
			Dogon Kade	6	6
			Filin Alo	4	4
			Total	**44**	**43**
			Nassarawa	7	7
ZAMFARA			Gurbi	8	7
			Moriki	7	7
	Zamfara		Dauran	7	7
	North-zone		Yanbuki	5	5
			Bachaka	6	6
		Zurmi	Mayasa	4	4
			Total	**44**	**43**
			Aggregate	**88**	**86**

Source: Field survey, 2015

Table 3.3: Zamfara- Southern Zone

State	Goe-political Zone	Selected Local Government Areas	Selected groundnut cake and oil processing Areas	Sample of groundnut oil and cake processing Ventures	Sampled groundnut cake and oil processing Ventures
			Jangebe	5	5
			Talata Mafara	6	6
			Matusgi	5	5
			Morai	3	3
		Talata Mafara	Garbadu	3	3
			Kagara	5	
			Gwaram	5	5
			Total	**27**	**27**
Zamfara	**Zamfara Southern-Zone**		Gummi	9	7
			Gyayyari	5	5
		Gummi	Gunmo	9	7
			Birnin Magaji	7	7
			Total	**30**	**26**
			Bagega	5	5
			Anka	4	4
			Wuya	6	6
			Sabon Birni	6	6
			Waramu	3	3
			Barayya Zaki	3	3
		Anka	Maiseri	2	2
			Total	**29**	**29**

Aggregate	**86**	**82**

Source: Field survey, 2015

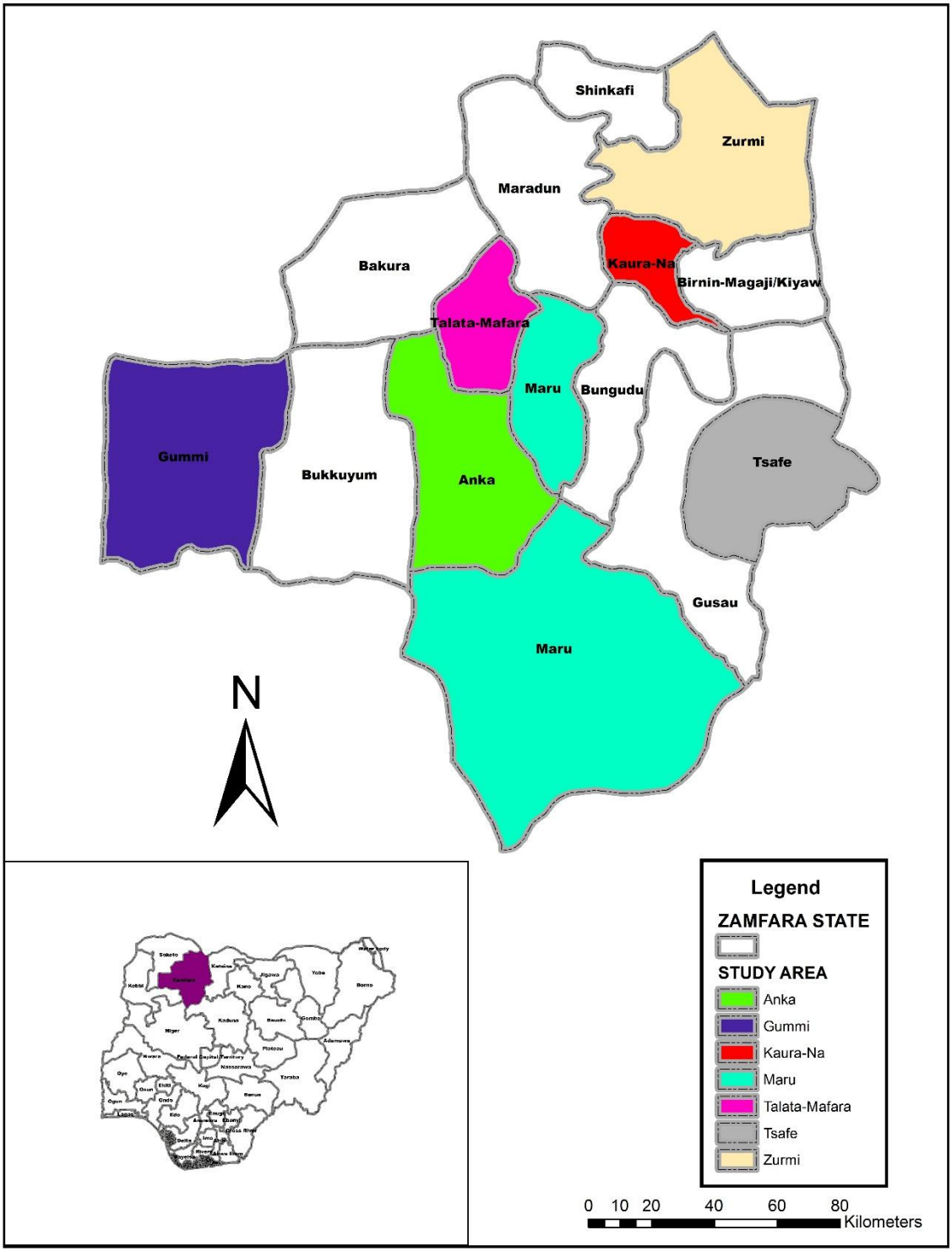


Figure 1: Map of Zamfara State showing the Study Area

3.3 Sources of Data Collection

Primary data was used for the study. The primary data was collected from August, 2014 to September, 2015, by means of structured questionnaire. A survey approach was used to collect the primary data. The data collected included data on socio – economic characteristics of the entrepreneurs such as their ages, their gender, educational level, access to loan, and profit level. Information from the primary source were used to assess the respondents on the basis on their age, level of education, household size, years of experience in the groundnut cake and oil ('*mangyada and kulikuli*') processing business, profitability of the business and the size of the processors' annual income. The data were also used to calculate the mean, standard deviations and the variances in the observation. Such summary statistic(s) provide information on how close or far the estimated results are from the actual data.

3.4 Method of Data Analysis

Combinations of analytical techniques were employed for data analysis to achieve the objectives of this study. These included descriptive and inferential statistics, frequency table and percentages, gross margin analysis, stochastic production frontier, and t- statistics.

3.4.1 Descriptive and inferential statistics

Descriptive statistics such as percentages and frequency distribution were used to describe and summarized data on responses on the socio-economic characteristics of the groundnut processing entrepreneurs and the constraints militating against their performance in the study area. They were used to achieve objective (i) and objective (vi). To achieve objective (vi), the frequency distribution was used. This was done by calculating the mean, standard deviations and the variances in the observation. Such summary statistic(s) provide

information on how close or far the estimated results were from the actual data. The mean and the variance are generally expressed as:

Mean = $\sum FX / \sum F$……..... 1

Variance = $\sum f (X - m)^2 / \sum f$ …….....**.....**2

Where;

X = the Observed variable under investigation

F = frequency of observation

m = mean of the observation

$\sum$ = summation or sigma notation

3.4.2 Gross margin analysis

Gross Margin (GM) analysis was used to analyze the costs and returns of groundnut oil and cake in groundnut processing firms of the study area. This is to allow for the determination of the profitability of the groundnut processing ventures. It was used to achieve objective (ii). GM is estimated as:

GM = ATR – ATC, and

ATC = ATVC + AFC,..... (4)

Where

GM = gross margin ATR = Average Total Revenue, ATC = Average total costs, AFC = Average fixed costs and ATVC = Average Total Variable Cost

Total Revenue includes the returns from groundnut oil and all other bi-products from groundnut. ATVC includes cost of raw groundnuts, salts, water, pepper, firewood, and cost of other variable inputs.

3.4.3 Stochastic frontier model

The Stochastic Frontier Model was used to determine the economic and allocative efficiencies of the groundnut processing in the study area to achieve objective (iii) and objective (iv). Coelli (1992) stated the general stochastic frontier model as:

$$\text{Log } Y = f(\log X_i) + V - U \quad \text{.....(5)}$$

However, the Cobb – Douglas form of the stochastic frontier model is widely used in many empirical efficiency measurements. It is transformed into processing function as:

$$Y=\beta o + \beta_1 \ln X_1+\beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + V_{it} - U \quad \text{.....(6)}$$

Where;

Y = Output of the groundnut processed in litres (oil) and in Kg (cake) per month

X_1= Labour (hours) per month

X_2= quantity of 100 Kg bags of fresh groundnut per month

X_3= fuel wood (Naira)

X_4=depreciation cost (Naira)

X_5= other variables (water, transport, storage) (Naira)

U_{it} = one sided components which captures deviations from frontier as a result of inefficiency of the firm.

V_{it} = effect of random shock outside the processors control, observation, measurement error and other stochastic error terms.

β_i = vector of coefficients for the associated independent variables in the production function,

i= 1, 2, …… 5

From the frontier production function, the technical efficiency can be estimated as follows:

$$TE = Y_i / Y_j = f(Xi)\, e^{v} * e^{-u} / f(X_i)\, e^{v} = e_j^{-u}$$

Where;

e = natural logarithm = 2.718 and other variables are as defined earlier.

The allocative efficiency (AE) is calculated using the Cobb-Douglas stochastic frontier cost function stated as:

$$\ln C = \beta o + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + V_{it} + U \quad \text{.....(7)}$$

lnC = total cost of processing per month (Naira)

X_1= cost of Labour (hours) per month

X_2= cost of quantity of 100 Kg bags of fresh groundnut per month

X_3 = cost of fuel wood (Naira)

X_4 = depreciation cost (Naira)

X_5 = costs of other variables (water, transport, storage) per month (Naira)

U_{it} = one sided components which captures deviations from frontier as a result of inefficiency of the firm.

V_{it} = effect of random shock outside the processors control, observation, measurement error and other stochastic error terms.

β_i = vector of coefficients for the associated independent variables in the production function,

i= 1, 2, …… 5

Economic efficiency (EE) is defined as the capacity of a firm to produce a predetermined quantity of output at minimum cost for a given level of technology. It is equal to the product of technical efficiency and allocative efficiency, expressed as;

EE= TE * AE …….(8)

3.4.4 Inefficiency model

To obtain the socio-economic factors influencing the processors' level of inefficiency, a model against some socio-economic factors of the processors was used to further achieve objective (iv). Battese and Coelli (1995) expressed the inefficiency model as:

$Y_{it} = \exp^{(X\beta + Vit - Uit)}$ ……(9)

The linearized form of the model is expressed as:

$Ui = \delta_0 + \delta_1 Z_1 + \delta_2 Z_2 + \delta_3 Z_3 + \delta_4 Z_4 + \delta_5 Z_5 + Wi$ …… (10)

Where ;

Z_1 = years of experience of the groundnut processors

Z_2 = level of education of the groundnut processors

Z_3 = age of the groundnut processors

Z_4 = membership of association

Z_5= amount of credit

Wi = random variable with a mean of zero and constant variance

δ_i = partial slopes, i= 0, 1,2,……5

These variables are included in the model to determine their possible influence on the technical and allocative efficiencies of the groundnut processors.

3.4.5 Independent variables

(i) Labour (X_1):- This is made up of both family and hired labour. Family labour was evaluated using the principle of opportunity cost; it is assumed that family labour served as a substitute for hired labour (Ogah, 2004).The labour equivalent was adopted in line with that of Norman (1972). Children, accorded 0.50; women accorded 1 and men accorded 1.Since women rather than men mostly take part in processing activities, they were given equal value of one. Labour input was measured in labour hours with unit cost as multiplied to get the labour cost (both family and hired labour). Labour is expected to relate positively with output and was measured in naira.

(ii) Fresh groundnut seeds (X_2):-This refers to the quantity of fresh groundnut used for processing into groundnut cake and oil. The seeds were measured in kilogram. Fresh groundnut seeds determine the total output because it is the main processing raw material; therefore, it is expected to have a positive sign. The cost was derived from the multiplication of price per kilogram and the number of kilogram's processed. It was measured in naira and is expected to relate with total cost of processing positively.

(iii) Fuel wood (X_3):- This referred to fuels such as firewood, charcoal, chips, sheets, pellets and saw dust. The particular form used depends on upon sources, quantity and application. In many areas in the study area, wood is the most easily available form of fuel, requiring few or no tools in the case of picking them.

(iv) Depreciation cost (X_4):- All fixed items were depreciated using straight line method of depreciation in order to guard against over valuation of the cost incurred in each processing year. The depreciation items include: machines (thresher, sterilizer, digester, presser, and clarifier), drums, mortar and pestle, jerry-can, basin and pot. This is because of the wear and tear of the items which can render it inefficient. It is expected to have a negative sign to signify that depreciation is a decreasing function of output. It was measured in naira and expected to have negative relationship with the output.

(v) Other variable costs (X_5):- This variable was measured in terms of amount spent on items such as transportation, water, fuel, security and storage. This cost increases total cost of processing and reduces profit. It was measured in naira and expected to have negative relationship with the output.

(vi) Processing experience (Z_1):- This indicates the number of years spent so far in groundnut processing business. According to Omoti (2001) the primary determinants of a potential processor's capabilities are experience in business and the quality of the information provided as far as extension workers are concerned. Based on their exposure it could be adjudged that they possess greater ability to predict possible problems and likely solutions that result in higher efficiency level. It is therefore expected that the processing experience should have a positive relationship with efficiency. It was measured in years.

(vii) Education (Z_2):- This refers to the level of formal education received by the processor. Education level of the processor is expected to have positive sign, since educated processors are more likely to be business alert and possess the ability to seize business initiatives or advantage. It was measured in years of schooling.

(viii) Age (Z_3): Asongwa *et al* (2011) also observed that groundnut processors within the active age bracket has a positive effect on technical efficiency while the age of elderly groundnut processors has positive effect on technical inefficiency. This is because old people are less energetic less receptive to business innovations and hence, developed inefficient and production practices. Similarly Ogundari and Ojo (2006) in their work on the economic efficiency of small-scale food crop production in Nigeria, stated that rising age of groundnut processors would lead to a declined in their level of efficiency.

(ix) Membership of association of the processors (Z_4): Membership of association empowers people in their business and farming activities thereby improving their economic status. It is expected that members of processing association will tend to adopt an innovation faster than non-members as a result of ease of information flow and influence from adopters in the association. Therefore, it is expected to be negative in the inefficiency model. This was measured as the number of years a member has spent in the association.

(x) Amount of credit loans (Z_5): This represents processors' amount of credit facilities received either in cash or in kind. It refers to the amount or its money value equivalent borrowed from lending agencies (banks, government, friends, money lenders, relatives) by the processors in order to sustain and improve management of his processing business through the purchase of processing inputs and the hiring of labour where needed. This was measured as dummy; 1 = access; 0 = otherwise.

3.4.6 Foster – Greer and Thorbeke (FGT) model of poverty measurement

The Foster – Green and Thorbeke (FGT) model of poverty measurement was used to achieve objective (v). The model was developed by Foster – Green and Thorbeke in 1984.

It is also called the P-alpha class of poverty measures (Glewwe, 1990). The model is stated as;

$P_{\alpha} = q / n \sum_{1}^{q}[(Zi - Yi)/Z]$ …….3.4.6a

Where the variables are redefined as follows:

Z = poverty line

q = number of groundnut processor below the poverty line in the study area

n = total number of groundnut processors in the study area

Y_i = expenditure of the groundnut processors in the study area

α = Foster – Greer and Thorbeke index which takes the value 0, 1 , 2.

In using this model, consideration was given to the differences in the needs of the groundnut processors due to differences in their household size and composition. The household expenditure per adult equivalent was used as a measure of welfare. However, there are wide choices of adult equivalent scales used in different countries, this research adopts that of the Organization for Economic Cooperation and Development (OECD) because of its simplicity and familiarity. In using the equivalent scale, a cut-off point needs to be selected to serve as poverty line across the distribution of real household expenditure per adult equivalent. Hence a relative poverty line set at one-third (1/3) of mean consumption-expenditure was used in identifying the core poor (Anyawu, 2007). The equivalent scale is expressed as:

$Exp = exp / n^{0.7}$ …… 3.4.6b

Where;

Exp = total expenditure by the groundnut processors

0.7 = exponential formulation

The components and derivations of the Foster-Green and Thorbeke model are:

(i) Simple Head Count Ratio: this gives the percentage of sample living in the household with expenditure per capita less than poverty line. In other words, it measures the number of poor as a percentage of the total population. The poverty aversion parameter equal zero. From equation 3.4.6a, if $\alpha = 0$, the poverty index becomes

$P = q / n$ ……..……. 3.4.6c

(ii) Poverty Depth: The Poverty Depth / Expenditure Gap Ratio expresses the average short fall of expenditure as a fraction of poverty line itself. It can be used to determine the percentage of expenditure required to bring every individual below the poverty line up to the poverty line. A useful index is obtained when the head count ratio of poverty is multiplied by the income or expenditure gap ratio or it is when the poverty aversion parameter is equal to one (Foster, 1984). Hence ;

$P_1 = q / n \sum_1^q [(Zi - Yi)/Z]$ ……..... 3.4.6d

(iii) Severity Poverty Index: This is the mean of squared proportion of poverty gap expressed as:

$P_2 = q / n \sum_1^q [(Zi - Yi)/Z]^2$ …… 3.4.6e

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter focuses on the presentation and analysis of the research data. The result is presented as follows:

4.1 Socio-Economic Characteristics of Respondents

The socio-economic characteristics of the respondents which include education, sex, years of experience and age were considered to elicit relevant information on groundnut cake and oil processing in the study area.

4.1.1 Age of the respondents

The result of the study as presented in Table 4.1 showed that 30.2 percent of the groundnut processors were between the ages of 20-29 years, 21.0 percent were between 30-39 years, 15.1 percent were between 40-49 years, 19.0 percent between 50-59 years and 14.7 percent between 60-69 years. The result implied that groundnut processing ventures in the study area were largely embraced by the young and the middle-age men between the ages of 20 – 29 and 30 – 39. The average age of the processors in the groundnut processing businesses is 40 years. The role of age of entrepreneurs is very essential in business. The result of a study by Udoh and Nyienakuma (2008) on processing of agricultural products in Akwa Ibom State showed that processors within the active age groups are able to withstand stress and put more time in various business operations. Asongwa *et al* (2011) also observed that age of processors within the active age bracket has a positive effect on technical efficiency while the age of elderly entrepreneurs has positive effect on technical inefficiency. This is because old people are less energetic less receptive to business innovations and hence, developed inefficient and production practices. Similarly Ogundari and Ojo (2006) in their work on the economic efficiency of small-scale food crop production in Nigeria, stated that rising age of processors would lead to a declined in their level of efficiency.

Table 4.1: Age of the Respondents

Age Group (Year)	Frequency	Percentage
20-29	76	30.2
30-39	53	21.0
40-49	38	15.1
50-59	48	19.0
60-69	37	14.7
Total	**252**	**100**

Mean = 40 years,
Minimum = 20 years,
Maximum = 69 years,
Standard error = 0.79
Source: Field Survey, 2015

4.1.2 Respondents' level of education

The Table 4.2 shows that 15.9 % of the respondents had no formal education. 19.8 % and 13.9 % of the respondents had quranic education and others respectively. The percentage of respondents with secondary and primary education was estimated as 31.3 % and 19.1 % respectively. This distribution indicated that majority of them were literate processors who could read and write. The average time spent in educational institution was 8 years. The level of awareness and adoption of modern methods of groundnut processing are affected by the literacy status of the entrepreneurs. Those who are literate are expected to be more innovative because of their ability to get information more quickly and their ability to take more risk. Studies by Oluwatayo *et al.* (2008) on resource use efficiency of maize processors in rural Nigeria revealed that the more educated an entrepreneur is, the more the chances that he/she will adopt innovations than the uneducated ones. Therefore there is high probability that the groundnut processors in the study area will easily adopt new groundnut processing practices since about 84.1 % of them are educated.

Table 4.2: Respondents' level of education

Education	Frequency	Percentage
No formal education	40	15.9
Quranic Education	50	19.8
Primary Education	48	19.1
Secondary Education	79	31.3
Others	35	13.9
Total	**252**	**100**
Mean = 8 years		
Minimum = 14 years		
Maximum = 69 years		
Standard error = 0.17		

Source: Field Survey, 2015

4.1.3 Gender of the respondents

No society can progress without if some of its population is disadvantaged for reasons of gender. Incorporating gender into agricultural processing activities can encourage innovations and technological development which can lead to increase output. Result obtain shows that the average of the sex distribution in the study area is 5. Sampled groundnut processing respondents were about 90 percent female and about 19 percent males. This can be attributed to land tenure system which limited the proportion of land allotment by inheritance to females. Therefore the women engaged themselves mostly in the post harvest processing activities than men. This support the result of Akanngbe *et al* (2011) which reported that groundnut processing is a female dominated endeavour in Oyo State because over 90 percent of their processors were females.

4.1.4 Respondents' years of experience

The distribution of the respondents according to their years of experience in table 4.1.4 shows that 46.4% of groundnut processing entrepreneurs in the study area had experience in the business from one to ten years. 39.7% had been in the venture for about twenty years, 9.95 for about thirty years, 3.6% for about 40 years and only 0.39% for about 50 years. The mean year of experience for the groundnut processors in the study area is 13 years. This implied that the processors are highly experienced in the enterprise and that introduction of any change in technology may not be difficult to adopt by them.

Table 4.3: Respondents' Years of Experience

Years of Experience	**Frequency**	**Percentage**
1 – 10	117	46.4
11 – 20	100	39.7
21 – 30	25	9.9
31 – 40	9	3.6
41 – 50	1	0.39
Total	**252**	**100**
Mean = 13		
Minimum = 1		
Maximum = 41		
Standard error = 0.64		

Source: Field Survey, 2015

4.1.5 Scale of operation of the respondents

The distribution of the respondents according to the scale of operation in Table 4.4 shows that 27.8% of groundnut processors in the study area were mini- scale processors with start-up capital of less than N 100, 000. The result also showed that 21.9% of groundnut processors in the study area were micro- scale processors whose start-up capital ranges from N100,000 to N250,000, 31.8 % of groundnut processors in the study area were small- scale processors with start-up capital ranging from N250,000 to N500,000 and 18.7 of groundnut processors in the study area were medium- scale processors whose start-up capital ranges

from N500,000 to N1,000,000. The mean scale for the groundnut processors in the study area is 18, with a minimum and maximum of 1 and 33 respectively. This implied that groundnut processing ventures in the study area were dominated by small-scale processors.

Table 4.4 Scale of operation of the respondents

Scale of operation	**Frequency**	**Percentage**
Mini- scale processors	70	27.8
Micro- scale processors	55	21.9
Small- scale processors	80	31.8
Medium-scale processors	47	18.7
Total	**252**	**100**

Mean = 18
Minimum = 1
Maximum = 33
Standard error = 0.61

Source: Field Survey, 2015

4.1.6 Respondents' sources of groundnut

The distribution of the respondents according to sources of groundnut in Table 4.5 shows that 41.7% of groundnut processed in the study area was sourced from the local market. The result also showed that 27.8 % of groundnut processed in the study area comes from owned farms, 6.7 % from research institute, and 23.8% from other sources. The mean scale for the groundnut processors in the study area is 8, with a minimum and maximum of 3 and 19 respectively. The findings from the Table 4.5 revealed that local market is the main source of groundnut to the processors.

Table 4.5: Respondents' sources of groundnut

Sources of groundnut	Frequency	Percentage
Local market	105	41.7
Owned farm	70	27.8
Research institute	17	6.7
Others	60	23.8
Total	**252**	**100**

Mean = 8
Minimum = 3
Maximum = 19
Standard error = 0.11

Source: Field Survey, 2015

4.1.7: Respondents' sources of labour

The distribution of the respondents according to the number of employees in Table 4.6 shows that 3.7 % of labour were provided by the family, 17.9 % were hired, 25.8 % both from hired and family, 11.9 % from communal sources and 8.7 % from other sources. The mean is 11, with a minimum and maximum of 2 and 21 respectively. The use of large quantity of family labour may be attributed to the fact that they provide services at no cost to the processors.

Table 4.6: Respondents' sources of labour

Sources of labour	Frequency	Percentage
Family labour	90	35.7
Hired labour	45	17.9
Both family and hired	65	25.8
Communal labour	30	11.9
Others	22	8.7
Total	**252**	**100**

Mean = 11
Minimum = 2
Maximum = 21
Standard error = 0.44

Source: Field Survey, 2015

4.1.8 Total number of labour used per month by the respondents

The distribution of the respondents according to the number of labour in Table 4.7 shows that 27.8% of mini-scale groundnut processors in the study area used 1 – 10 labour per month. The result also showed that 21.9% of micro-scale groundnut processors in the study area used 11 – 20 labour per month, 31.8 of small-scale groundnut processors in the study area used 21 – 30 labour per month, and 18.7 of groundnut processors in the study area used 31 – 40 per month. The mean scale for the groundnut processors in the study area is 18, with a minimum and maximum of 1 and 33 respectively. The results from the table 4.1.8 suggest that the number of labour used by the processors increases with expansion in the scale of operation. Thus large firms used more labour than the small ones.

Table 4.7: Total number of labour used per month by the respondents

Scale of operation	Number of labour	Frequency	Percentage
Mini- scale processors	1 - 10	70	27.8
Micro- scale processors	11 -20	55	21.9
Small- scale processors	21 - 30	80	31.8
Medium-scale processors	31 - 40	47	18.7
Total		**252**	**100**

Mean = 18
Minimum = 1
Maximum = 33
Standard error = 0.61

Source: Field Survey, 2015

4.1.9: Respondents' household size

Table 4.8 shows the distribution of respondents based on their household. For the purpose of this study, household size was defined as the number of people the respondents fed and take care of. The result of the analysis presented in table 4.1.9 shows that about 60 percent of the mini-scale groundnut processors had a household size between one and five people and about 41 percent had a household size between six and ten people. This implies that expenditure on food and other household necessities may be minimal since majority of the groundnut processors (59.5) had only 1 to 5 members of household to feed and take care of, which is relatively small.

The Table 4.8 further shows that about 56 percent of the micro-scale groundnut processors had a household size between one and five people and about 44 percent had a household size between six and ten people. For small-scale processors, 52 percent of the groundnut processors had a household size between one and five people and about 48 percent had a household size between six and ten people while the medium-scale processors had 50 percent of household size between one and five people and about 50 percent household size

between six and ten people. This generally implies that expenditure on food and other household necessities may be minimal since majority of the groundnut processors had only 1 to 5 members of household to feed and take care of, which is relatively small.

Table 4.8: Respondents' household size

Scale of operation	Household size	Frequency	Percentage
Mini- scale processors	1 - 5	150	59.5
	6 - 10	102	40.5
		252	
Micro- scale processors	1 - 5	142	56.3
	6 – 10	110	43.7
		252	
Small- scale processors	1 - 5	130	51.6
	6 - 10	122	48.4
		252	
Medium-scale processors	1 – 5	127	50.4
	6 – 10	125	49.6
		252	
Total			**100**

Mean = 5
Minimum = 1
Maximum = 14
Standard error = 0.11

Source: Survey, 2015

4.1.10: Respondents' household consumption-expenditure

The result of the analysis presented in Table 4.9 shows that about 24 percent of the mini-scale groundnut processors spends between 0 and N10000 on household per month, 25 percent of the micro-scale groundnut processor spends between N 11000 and N20000 on household per month, 24.8 percent of the small-scale groundnut processor spends between

21000 and N30000 on household per month and 25.4 percent of the medium-scale groundnut processors spends between 0 and N10000 on household per month. The average weekly expenditure is N5000.

Table 4.9: Respondents' household consumption-expenditure

Scale of operation	Household expenditure per month (N)	Frequency	Percentage
Mini- scale processors	0 - 10000	60	23.8
Micro- scale processors	11000 - 20000	63	25.0
Small- scale processors	21000 – 30000	65	25.8
Medium-scale processors	31000 – 40000	64	25.4
Total	**63000 – 100000**	**252**	**100**

Mean = N20375
Minimum = N 5000
Maximum = N 30000
Standard error = 0.34

Source: Field Survey, 2015

4.1.11 Quantity (100kg bags) of groundnut processed by the respondents

The distribution of the respondents according to the quantity of groundnut processed in Table 4.10 shows that 27.8% of mini-scale groundnut processors in the study area processed 1/2 bag (100Kg) of groundnut per month. The result also showed that 21.9% of micro-scale groundnut processors in the study area 5 bags (100Kg) of groundnut per month, 31.8 % of small-scale groundnut processors in the study area processed 10 bags (100Kg) of groundnut per month, 18.7 of groundnut processors in the study area processed 20 bags (100Kg) of groundnut per month. The mean scale for the groundnut processors in the study area is 12, with a minimum and maximum of 3 and 13 respectively.

Table 4.10: Quantity (100kg bags) of groundnut processed by the Respondents

Scale of operation	100 kg bags processed per month	Frequency	Percentage
Mini- scale processors	0.5	70	27.8
Micro- scale processors	5	55	21.9
Small- scale processors	10	80	31.8
Medium-scale processors	20	47	18.7
Total		**252**	**100**

Mean = 12
Minimum = 3
Maximum = 13
Standard error = 0.46

Source: Field Survey, 2015

4.2 Profitability Analysis

In order to determine the profitability of groundnut oil and groundnut cake production in the study area various costs incurred and returns derived from the products were estimated. The sum of the total variable costs (TVC) and the total fixed costs (TFC) was subtracted from the gross revenue (GR) to give the gross margin (GM), which is a measure of profitability of the production. Since the ground processors in the study area have different scales of operations, different gross margins were computed for each scale of operation considered in this study. The cost and return profiles involved in the mini-scale processing of groundnut are shown in Table 4.11.

Table 4.11: Estimated gross margin per 100kg bag of groundnut for mini-scale processors

Scale of operation	Input per month	Quantity	Costs (N)	Revenue (N)
	Variable Inputs			
	Groundnut (in 100kg bag)	50 kg	7,250	Cake = 24,000
	Labour (hired)	4	1800	Oil = 7,500
	Salt (satchet)	3	150	
Mini-scale	Pepper (kg)	6 tons	720	
Processors	Water (litre)	4	0	
	Griding	-	300	
	Frying	-	2,000	
	Fixed Inputs			
	Mutter	4	5,600	
	Wooden pestle	4	600	
Total			**8,420**	**31,500**

Gross margin = 31500 – 18420 = N 13080

Source: estimated by the researcher (2015)

From the Table 4.11 above, groundnut constituted the highest variable cost (N 7,250) while salt had the least costs (N 150.00). This is expected since groundnut is the major input in the processing of groundnut oil and groundnut cake while salt is only included in groundnut cake and in a very small quantity.

Table 4.11 also showed that groundnuts cake gave the highest return of N 24000 while groundnut oil contributed N 7500 to gross revenue of the groundnut processors under study. This is also expected because groundnut cake is the major product and larger in quantity than the groundnut oil. The gross margin of N 13080 was realized in every ½ bag of 100 kg size of groundnut used in production of groundnut cake and groundnut oil. Thus, groundnut cake and groundnut oil production from the foregoing analysis is profitable.

From the Table 4.12, groundnut constituted the highest variable cost (N 72000) while salt had the least costs (N 1,200). The Table 4.12 also showed that groundnuts cake gave the highest return of N 137,000 while groundnut oil contributed N 37500 to gross revenue of the groundnut processors under study. This is also expected because groundnut cake is the major product and larger in quantity than the groundnut cake. The gross margin of N 29,700 was realized in every 5 bags of 100 kg size of groundnut used in production of groundnut cake and groundnut oil. Thus, groundnut cake and groundnut oil production from the foregoing analysis is profitable to the micro-scale processors in the study area.

Table 4.12: Estimated gross margin per 100kg bag of groundnut for micro-scale processors

Scale of operation	Input per month	Quantity	Costs(N)	Revenue(N)
	Variable Inputs			
	Groundnut (in 100 Kg bag)	500 kg	72,500	**cake =135, 000**
	labour (hired)	8	3,600	**oil = 37, 500**
	salt (satchet)	30	1200	
Micro- scale	pepper (kg)	60 tons	7200	
Processors	water (litre)	40	0	
	Griding	-	3000	
	Frying	-	18000	
	Fixed Inputs			
	Mutter	30	36000	
	Wooden Pestle	30	1300	
Total			**142,800**	**172, 500**
Gross margin = 172500 – 112,800 = N 29,700				

Source: estimated by the researcher (2015)

From the Table 4.13, groundnut constituted the highest variable cost (N 145000) while wooden pestle had the least costs (N3000). The Table 4.13 also showed that groundnuts cake gave the highest return of N300,000 while groundnut oil contributed N112,500 to gross revenue of the groundnut processors under study. This is also expected because groundnut cake is the major product and larger in quantity than the groundnut cake. The gross margin of N164,400 was realized in every 10 bags of 100 kg size of groundnut used in production of groundnut cake and groundnut oil. Thus, groundnut cake and groundnut oil production from the foregoing analysis is profitable to the small-scale processors in the study area.

Table 4.13: Estimated gross margin per 100kg bag of groundnut for small-scale processors

Scale of operation	Input per month	Quantity	Costs (N)	Revenue (N)
	Variable Inputs			
	Groundnut (in 100kg bag)	1000 kg	145000	Cake = 300,000
	Labour (hired)	12	7,200	Oil = 112,500
	Salt (satchet)	40	4,500	
Mini-scale	Pepper (kg)	80 tons	9,400	
Processors	Water (litre)	60	0	
	Grinding	-	5000	
	Frying	-	30000	
	Fixed Inputs			
	Mutter	40	44000	
	Wooden pestle	40	3000	
Total			**248,100**	**412,500**
Gross margin = 412500 - 248100 = N 164400				

Source: estimated by the researcher (2015)

From the Table 4.14 below, groundnut constituted the highest variable cost (N290000) while wooden pestle had the least costs (N5000). The Table 4.14 also showed that groundnuts cake gave the highest return of N600,000 while groundnut oil contributed N 216,000 to gross revenue of the groundnut processors under study. This is also expected because

groundnut cake is the major product and larger in quantity than the groundnut cake. The gross margin of N289.700 was realized in every 20 bags of 100 kg size of groundnut used in production of groundnut cake and groundnut oil. Thus, groundnut cake and groundnut oil production from the foregoing analysis is profitable to the small-scale processors in the study area.

Table 4.14: Gross margin per 100kg bag of groundnut for medium-scale processors

Scale of operation	Input per month	Quantity	Costs (N)	Revenue(N)
	Variable Inputs			
	Groundnut (in 100 Kg bag)	20 bag	290000	**cake = 600, 000**
	labour (hired)	12	14,400	**oil = 216,000**
	salt (satchet)	40	4,500	
Medium- scale	pepper (kg)	80 cups	9,400	
Processors	water (litre)	60	0	
	Griding	-	8000	
	Frying	-	40000	
	Fixed Inputs			
	Mutter	40	155000	
	Wooden Pestle	40	5000	
Total			**526,300**	**816,000**
Gross margin = 816000 - 526300 = N 289700				

Source: estimated by the researcher (2015)

From the Table 4.15 below, the overall total costs is N998,220 while the overall total revenue is N1,432,500. The gross margin of N 434,280 was realized. Thus, groundnut cake and groundnut oil production from the foregoing analysis are profitable to all the groundnut processors in the study area irrespective the scale of operation they adopt.

Table 4.15: Total Gross margin analysis

Scale of operation	Total costs (N)	Total revenue (N)
Mini- scale Processors	18, 820	31, 500
Micro- scale Processors	119,000	172, 500
Small- scale Processors	334,100	412, 500
Medium- scale	526,300	816,000
Aggregate	**998,220**	**1,432,500**

Gross margin = 1,432,500 - 998,220 = N 434,280

Source: estimated by the researcher (2015)

4.3 Economic and Allocative Efficiencies of Groundnut Processors

4.3.1 Groundnut processors' economic efficiency indices

The stochastic frontier production and cost functions were used to estimate the economic efficiency indices of the groundnut processors in the study area. As Greene (1993) observed, economic efficiency indices were estimated from as products of technical and allocative efficiency indices. Thus, the level of technical efficiency of a particular firm is characterized by the relationship between observed production and some ideal or potential production. The frequency distribution of the predicted economic efficiency of the groundnut processing firms in the study area is presented in Table 4.16. From Table 4.16, the average economic efficiency indices of the groundnut processing firms in the study area was 0.36, with a low of 0.06 and a high of 0.66. The result showed that 23.9 percent of the groundnut processing firms had economic efficiency indices between 0.01 and 0.20. About 29.8 % of the

groundnut processing firms had economic efficiency indices between 0.21 and 0.30, 11.9% had between 0.31 and 0.40, 7.9% between 0.51 and 0.60 and 2.8% between 0.61 and 0.70. The average best groundnut processing firms needs a cost saving of 45%, that is, (1– [0,36/0.66 x 100]) to attain the frontier while the average worse groundnut processing firms require a cost saving of 91%, that is, (1 – [0.06/0.66 x100]) to become the most efficient entrepreneur in the business.

Table 4.16: Economic efficiency estimates.

Economic efficiency range	**Frequency**	**Percentage**
0.01 – 0.1	60	23.8
0.11 – 0.20	60	23.8
0.21 – 0.30	75	29.8
0.31 – 0.40	30	11.9
0.41 – 0.50	00	0.00
0.51 – 0.60	20	7.9
0.61 – 0.70	7	2.8
Total	**252**	**100**

Mean = 0.36
Minimum = 0.06
Maximum = 0.66
Standard error = 0.12

Source: Field Survey, 2015

4.3.2 Groundnut processors' allocative efficiency

Table 4.17 shows the frequency distribution of allocative efficiency of the groundnut processing firms in the study area. Of the sampled groundnut processing ventures, 13.9% had allocative efficiency between 0.01 and 0.1, 11.9% between 0.11 and 0.2, 17.9% between 0.21 and 0.30, 18.7% between 0.31 and 0.40, 19.8% between 0.41 and 0.50, 6.7% between 0.51 and 0.60, 4.0% between 0.61 and 0.70, 3.2% between 0.71 and 0.80, 2.4% between 0.81 and 0.90 and 1.6% between 0.91 and 1.00. The predictive allocative efficiencies vary

widely with minimum and maximum values of 0.10 and 0.95 respectively and a mean allocative efficiency value of 0.51. The above result implied that if the average groundnut processing firms in the sample was to achieve allocative efficiency level of his most efficient counterpart, then the average processors could realize 46.3, that is, (1 – [0.5/0.95 x 100]) cost saving. A similar calculation for the most allocatively inefficient processors reveals cost saving of 89%, that is (1- [0.10/0.95 x 100]

Table 4.17: Allocative efficiency estimates.

Allocative efficiency range	**Frequency**	**Percentage**
0.01 – 0.1	35	13.9
0.11 – 0.20	30	11.9
0.21 – 0.30	45	17.9
0.31 – 0.40	47	18.7
0.41 – 0.50	50	19.8
0.51 – 0.60	17	6.7
0.61 – 0.70	10	4.0
0.71 – 0.80	8	3.2
0.81 – 0.90	6	2.4
0.91 – 1.00	4	1.6
Total	**252**	**100**
Mean = 0.51		
Minimum = 0.10		
Maximum = 0.95		
Standard error = 0.95		

Source: Field Survey, 2015

4.4 Determinants of Economic and Allocative Efficiencies and Inefficiencies

4.4.1 Determinants of economic efficiencies and inefficiency

Table 4.18 shows results of the estimated parameters of the economic efficiency and inefficiency models. Labour, cost of fresh groundnut and other variables are statistically

significant at 5% level. All the coefficients of labour, cost of fresh groundnut and other variables are positive. These suggest that an increase in all the costs of input increases the prices of the processed groundnut cake and oil.

Also, the results of the inefficiency model revealed that age, education, annual income, years of experience and gender are the major determinants of economic efficiency in groundnut processing in the study area. This implies that increase in age, education and annual income and the use of improved variety of groundnut decreases the economic efficiency of processors. However, increase years of experience and annual income increases the economic efficiency of groundnut production in the study area.

The coefficient for educational level was negative and significantly different from zero at 5% level. The negative coefficient for education implies that economic inefficiency reduces as this factor increases. Education is a central ingredient in a strategy to improve processing activities especially where the use of modern inputs are emphasized (Lockhead *et al*., 1980). A study by Jamison and Lau (1982) in low – income countries indicated the significant contribution of education towards agricultural production. The study revealed that a processor who had completed four years of elementary education, obtained on the average 13.2% more output than those with no education. The role of education is important for development and management of low-income agriculture. Education influences the processors to adopt improved practices in business. It also helps in changing the outlook of the processors so that he will be receptive to his farm productivity. In his estimation of economic efficiency of small farmers in sweet potato production in Delta State of Nigeria, Gbigbi (2011) found that better performance by more educated processors may be attributed to education access, which gives the farmers the ability to perceive, interpret and respond to new information and improved technologies such as fertilizers, pesticides and planting materials much faster than their less educated counterparts.

The coefficient for membership of cooperative was negative and statistically significant at 10% level of probability. This means that increase in the years spent as a member of a cooperative will reduce the level of economic inefficiency. Membership of cooperative can serve as a medium for exchange of ideas that can improve their business operations. It has also been reported that membership of cooperative can serve as an avenue through which innovations diffuse among processors (Adeola *et al*., 2011).

Table 4.18: Estimated Determinants of Economic efficiency and inefficiency

'Variable	**Coefficient**	**Standard Error**	**t-ratio**
Constant (βo)	0.0724	0.0345	2.0985
cost of Labour (β_1)	0.30005**	0.0008	0.0250
cost of fresh groundnut (β2)	0.2404**	0.0025	0.0960
Fuel wood (β_3)	- 0.1230	0.0012	2.5000
Depreciation (β_4)	- 0.1100**	0.0058	-1.6974
Other variables (β_5)	0.4512**	0.0671	0.0003
Inefficiency model			
Constant (δ_0)	8.28**	0.0124	9.4300
experience of the processors (δ_1)	-0.822*	0.0023	-4.115
Educational level (δ_2)	-0.039**	0.0008	-0.40
Age (δ_3)	1.14	0.0234	1.94
Association membership (δ_4)	-0.32**	0.0087	-5.20
Amount of credit (δ_5)	0.04	0.i765	0.717

*****P<0.01, **P<0.05, and *P<0.10**

Source: estimated by the researcher using e-view 3.4

4.4.2 Explanation of parameters of economic efficiency

(i) Labour (X_1): From the Table 4.18, labour has an estimated coefficient of 0.3 and significant at 5% level of probability. This shows that a unit increased in the quantity of labour increases the output of processing by about 30%. Therefore labour is a very important factor input in groundnut processing enterprises in the study area.

(ii) Fresh groundnut seeds (X_2): the coefficient of fresh groundnut seeds was found to be 0.24 and significant at 5% level of probability. This indicates that a unit increase in the quantity of fresh groundnut bunch increases the output of processing by 24%. Hence, the seeds of fresh groundnut are relevant in groundnut processing in the study area.

(iii) Fuel wood (X_3): the coefficient of fuel wood was negative and not significant. This shows that expenditures on fuel wood is a decreasing function of the output of groundnut. In other word, the more the fuel consumed in the processing process, the less the profit margin. Thus, a unit increase in the cost of fuel decreases the output of groundnut cake and oil by 12%.

(iv) Depreciation (X_4): the coefficient of depreciation was estimated at -0.11 but significant at 5% level of probability. This implies that a unit increases in deprecation decreases the output of groundnut processing by 11%. The negative sign is attributed to the fact that the wear and tear of processing equipments could lead to loss of groundnut cake and oil output.

(v) Other variables (X_5): other variable costs include the cost of transportation, water, storage, fuel and loading associated with groundnut processing in the study area. It has a positive coefficient and significant at 5% level of probability. This suggests that a unit increase in the efficient use of other variables increases the output of groundnut processing

by 45%. Therefore the influence of other variables in the groundnut processing into cake and oil cannot be neglected.

4.3.3 Explanation of parameters of economic inefficiency

(i) Experience of the processors (Z_1): the estimated coefficient of processing experience was found to be -0.822 and significant at 10% level of probability. Therefore a unit increase in years of experience decreases inefficiency level of the processors by about 80%. This implied that as years of processing experience increases, economic inefficiency decreases. It further suggests that processors with longer years of experience tend to be more efficient than those with fewer years of experience. Therefore, the years of experience of the groundnut processors in the study area contribute significantly to their economic efficiency.

(ii) Education (Z_2): The coefficient of education is negatively related to inefficiency. It was estimated to be -0.039 and significant at 5% level of probability. It suggests that a unit increases in education decreases the inefficiency level of the groundnut processors by about 3%. This is so because groundnut processors with considerable years of cognate and related years of education respond readily to effective decision-making in processing.

(iii) Age (Z_3): the coefficient of age of the processors was estimated to be 1.14. However, it is insignificant as shown in the Table 4.18. The positive sign suggests that as the processor gets old inefficiency increases. This support the result of study by Barret (2009) that processors within the active age bracket are more efficient that those within the inactive age bracket.

(iv) Membership of association (Z_4): the coefficient of association membership was found to be positive and significant at 5% probability level. This suggests that processing inefficiency will be lowered the longer the processors stay in associations.

(v) Amount of credit (Z_5): the coefficient of access to credit was found to be negative and insignificant. However, the result disagrees with many empirical studies that access to credit improved the performances of small-scale processing enterprises. However, the negative sign could be due to untimely access to credit facilities by the processors.

4.4.4 Determinants of allocative efficiency and inefficiency

The estimates of the determinants of allocative inefficiency in the study area are presented in Table 4.19. The variance parameter estimate for sigma squared (O^{-2}) and gamma (γ) were 188.8 and 0.9886, respectively. The variance parameters are significant at 1% level. This means that cost inefficiency effects make significant contributions to the cost of processing of groundnut in the study area. The estimated gamma parameter of 0.589 indicates that about 58.9% of the variation in the total cost of processing of groundnut in the study area was due to differences in their allocative efficiencies.

The coefficient of depreciation was negative but significant at 5%. This means that the cost of depreciation raises the technical competence of processors and enables them to cope with the complexities associated with adoption of improved technologies (Tanko and Opara, 2009). Seyoum et al. (1998) and Weir and Knight (2000) in their study observed that depreciation enhances an entrepreneur's ability to seek, decipher and make good use of information about production inputs.

Table 4.19: Estimated Determinants of allocative efficiency and inefficiency `

Variable	Coefficient	Standard error	T-ratio
Constant (βo)	0.5257***	0.0812	6.4741
cost of Labour (β_1)	0.3006	0.0011	0.0545
cost of fresh groundnut (β2)	-0.0087	0.0057	-1.5263
Wood fuel (β_3)	-0.0132	0.0050	-2.6400
Depreciation (β_4)	-0.0198**	0.0149	-1.3288
Other variables (β_5)	0.4512**	0.0671	0.0003
Inefficiency model			
Constant (δ_0)	1.08**	0.0104	1.4300
Experience of processors (δ_1)	-0.467*	0.0761	-0.0115
Educational level (δ_2)	-0.006**	0.0003	-0.403
Age (δ_3)	4..111	0.0354	2.3294
Association membership (δ_4)	-0.342**	0.0066	-7.3420
Amount of credit (δ_5)	1.214	0.1355	0.7174
Sigma-square (σ^2) = 188.8			
Gamma (γ) = 0.9886			

***P<0.01, **P<0.05, and *P<0.10

Source: estimated by the researcher using e-view 7

4.4.5 Explanation of parameters of allocative efficiency

(i) Labour (X_1): From the Table 4.19, the estimated coefficient of labour was 0.3 but insignificant. This shows that labour cost has positive effects on allocative efficiency of the processors in the study area by about 30%. The positive relationship between labour and allocative efficiency supports the study by Ogundari (2006) on economics of scale and cost efficiency in in small-scale maize production in Nigeria.

(ii) Fresh groundnut seeds (X_2): the coefficient of fresh groundnut seeds was found to be -0.0087 but insignificant. This indicates that a unit increase in the cost of fresh groundnut bunch decreases the output of processing by 0.08%. However, this is in line with the *aprori* expectation. Experience had shows that an increase in costs should have negative impact on the return of a processing business. Hence the seeds of fresh groundnut are relevant in groundnut processing in the study area.

(iii) Wood fuel (X_3): the coefficient of wood fuel was negative and not significant. This shows that as the expenditure on fire wood increases, the profitability of the processed products or output decreases. Thus a unit increase in the wood fuel decreases the return on groundnut cake and oil by 1.3%.

(iv) Depreciation (X_4): the coefficient of depreciation was estimated at -0.0198 and significant at 5% level of probability. This implies that a unit increases in deprecation decreases the allocatve efficiency of the processors and the output of groundnut processing by about 2%. The negative sign is attributed to the fact that the wear and tear of processing equipments could lead to loss of groundnut cake and oil output.

(v) Other variables (X_5): other variable costs include the cost of transportation, water, storage, fuel and loading associated with groundnut processing in the study area. It has a positive coefficient of 0.4512 and significant at 5% level of probability. This suggests that a unit increase in the efficient use of other variables increases the output of groundnut processing by 45%. Therefore the influence of other variables in the groundnut processing into cake and oil cannot be neglected.

4.4.6 Explanation of parameters of allocative inefficiency

(i) Experience of the processors (Z_1): the estimated coefficient of processing experience was found to be -0.467 and significant at 10% level of probability. Therefore a unit increase in years of experience decreases inefficiency level of the processors by about 47%. This implied that as years of processing experience increases, allocative inefficiency decreases. It further suggests that processors with longer years of experience tend to be more efficient than those with fewer years of experience. Therefore, the years of experience of the groundnut processors in the study area contribute significantly to their economic efficiency.

(ii) Education (Z_2): The coefficient of education is negatively related to inefficiency. It was estimated to be -0.006 and significant at 5% level of probability. It suggests that a unit increases in education decreases the inefficiency level of the groundnut processors by about 0.6%. This is so because groundnut processors with considerable years of cognate and related years of education respond readily to effective decision-making in processing.

(iii) Age (Z_3): the coefficient of age of the processors was estimated to be 4.111. However, it is insignificant a shown in the Table 4.19. The positive sign suggests that as the processor gets old inefficiency increases. This support the result of study by Barret (2009) that processors within the active age bracket are more efficient that those within the inactive age bracket.

(iv) Membership of association (Z_4): the coefficient of association membership was found to be negative with coefficient -0.342 and significant at 5% probability level. This suggests that processing inefficiency will be lowered the longer the processors stay in associations.

(v) Amount of credit (Z_5): the coefficient of amount of credit to the processors was estimated to be 1.214. However, it is insignificant a shown in the Table 4.19. The positive sign suggests that as the more the groundnut processors could get access to credits, the more their efficiency parameters. Credit refers to the amount or its money value equivalent borrowed from lending agencies (banks, government, friends, money lenders, relatives) by the processors in order to sustain and improve management of his processing business through the purchase of processing inputs and the hiring of labour where needed.

4.5 The Level of Poverty among the Groundnut Processors in Zamfara State

The poverty indices were estimated by measuring the wellbeing of the groundnut processors in terms of their total consumption-expenditure and their household size before and after engaging in groundnut processing business. The Foster-Greer and Thorbeck model of adult equivalent scale was used. Having established the individual members of the household consumption-expenditure per month as indicated in Table 4.20, one-third (1/3) of the mean consumption expenditure was used to establish a poverty line of N1198.40 and N 1173.94 per month per household before and after engaging in groundnut processing ventures respectively. These measures of poverty lines were in accordance with Foster-Greer and Thorbeck model as shown in column III of Table 4.20(a) and Table 4.20 (b) respectively. From these poverty lines, the p-alpha (poverty index) class of poverty measures was used in determining the headcount, depth and severity of poverty among the groundnut processors as indicated in column VI, VIII and IX of both Table 4.20(a) and Table 4.20(b)

Table 4.20 (a): Foster-Greer and Thorbeck measure of poverty for Groundnut Processors

I	II	III	IV	V	VI	VII	VIII	IX
Y (N)	**ME (N)**	**Z(N)**	**TEP (N)**	**AEP (N)**	**HCR**	**PGR**	**PD(%)**	**PS(%)**

					(%)	**(%)**	**P = 1**	**P = 2**
98,200	244.32	198.40	27, 011	29.98	0.39	0.87	0.291	0.193

Table 4.20(b): Foster-Greer and Thorbeck measure of poverty for Groundnut Processors

I	II	III	IV	V	VI	VII	VIII	IX
Y (N)	**ME (N)**	**Z(N)**	**TEP (N)**	**AEP (N)**	**HCR (%)**	**PGR (%)**	**PD(%) P = 1**	**PS(%) P = 2**
131,500	521.83	173.94	33, 047	493.24	0.27	0.78	0.211	0.114

Key to the Table 4.20(a).

Y = Total expenditure per household equivalent. This was gotten by dividing each household's expenditure by the household size raised to the power of 0.7, being the adult equivalent scale. Secondly, the expenditure per household equivalent was summed up to give N131,500 as shown in column I of Table 4.20 (b).

ME = Mean household expenditure. This was gotten by calculating the average of the total expenditure per household equivalent (131,500/ 252) to give 521.83 as shown in column II. Note that the total number of sample is 252.

Z = Poverty line. This was gotten by finding 1/3 of the mean household expenditure: thus 1/3 (521.83) to give 173.94 as shown in colunm III.

TEP = Total expenditure of the poor. This was gotten by computing the total expenditure of all those below the poverty line to give a total of 33, 047 as shown in column IV.

AEP =Average expenditure of the poor. This was gotten by dividing the expenditure of the poor by the number of those below the poverty line thus (33, 047/67) to give 493.24 as shown in column V.

HCR = Head count ratio. This was gotten by dividing the total number of the poor household (q) by the total number of sample population (N) thus; (67/252) to give 0.27 as shown in column VI.

PGR = Poverty gap ratio. This was gotten by calculating the difference between expenditure of the poverty line and average expenditure of the poor and expressing it as a function of the poverty line thus; (173.94 – 37.95) /173.94 to give 0.78 as shown in column VII.

PD = Poverty depth. This was gotten by multiplying the head count ratio by the poverty gap ratio thus; 0.27 x 0.78 to give 0.211

PS = Poverty severity. This was computed by multiplying the head count ratio by the poverty gap ratio raised to the power of 2, thus; 0.27 x $(0.78)^2$ to give 0.114 as shown in column IX.

Po = Head count Poverty index

P_1 = poverty gap (depth)

P_2 = poverty severity

The poverty measures indicated in Table 4.20(a) shows the poverty status of the groundnut processors before engaging in groundnut processing business. The Table 4.20(a) shows that 39 % of the groundnut processor was living below the line of poverty while 61% were above the poverty line. The poverty head count, depth and severity were 87 %, 29 % and 19 % respectively. This implied that 87 % of the groundnut processor was below the poverty line of N N1198.40 per month while 29 % of expenditure is needed to bring them up to the poverty line. The poorest groundnut processors accounted for only 19 %.

Table 4.20(b) shows the poverty status of the groundnut processors after engaging in groundnut processing business. The Table 4.20(b) shows that 27 % of the groundnut processor was living below the line of poverty while 73% were above the poverty line. What this suggests is that, by engaging in groundnut processing business in the study area, the

number of respondents living below the poverty line has been reduced from 39 % to 27 %. The poverty line, poverty head count, depth and severity which were N 1198.40, 87 %, 29 % and 19 % respectively falls to 1173.94, 27 %, 21 % and 11 % respectively. In other word, 27 % of the groundnut processor was below the poverty line of N N1173.94 per month while only 21 % of expenditure is needed to bring them up to the poverty line. The poorest groundnut processors accounted for is reduced to only 16% from 19 %. Hence groundnut processing business could be said to have positive impact on the wellbeing of the processors in the study area.

4.6 Constraints Encountered by Groundnut Processing Firms in the Study Area

The constraints militating against groundnut processing in the study area varies from one respondent to another. However, the processors pointed out that inadequate capital for expansion, inadequate infrastructure, management characteristics, socio-economic problem, and strategic planning problem are the major constraints hindering the processing of groundnut. Other constraints include inadequate labour supply, lack of readily available market, incomplete return of credit sales, low volume of production, unstable Electricity, and lack of processing shed. A similar finding was also made by Haruna *et al.*, 2006). The respondents also pointed out that their profit will increase if the constraints can be overcome. The frequency distribution of the constraints faced by the processors are ranked in order of priority in the Table 4.21 below:

Table 4.21: Constraints faced by groundnut processors

Problem	**Frequency**	**Percentage**
Financial problem	155	61.5
Inadequate infrastructures	39	15.5
Internal characteristics	36	14.3
Management problem	11	4.4
Socio-cultural problem	7	2.8
Strategic planning problem	4	1.6
Total	**252***	**100***

Source: estimated by the researcher

(i) Financial problems

Lack of Finance is a major constraint to the growth and expansion of groundnut processing firms in Zamfara State as shown in Table 4.21. It accounted for about 61.5 %. Empirical evidence shows that adequate financing contributes about 25 percent to the success of groundnut processing firms (Ogujuiba *et al.*, 2004). In Nigeria, most groundnut processing firms are folding up or lack competitiveness because they lack the much required financial capacity to prosecute their manufacturing concern. Most of these groundnut processing firms cannot access loan on a long -and short -term basis. In a World Bank report in 2001, it was reported that almost 50 percent of micro, 39 percent of small-scale firms (groundnut processing firms included), and 37 percent of medium -scale firms are financially constrained in Nigeria, as opposed to 25 percent of the very large firms (World Bank, 2001). The implication of this is that groundnut processing firms are either discriminated against or cannot access funds at the credit market. In addition to this, the stringent conditions attached to loan and credit also discourages these industries from accessing credit from the credit

market. This factor has largely undermined the capacity of groundnut processing firms in Nigeria generally and Zamfara State in particular. While small-scale groundnut processing firm operators have been claiming that banks impose stringent conditions and terms of approval, the Banks on the other hand, have claimed that SME operators don't present bankable projects. Ogujuiba *et al*. (2004) in a report on groundnut processing firms claimed that 20 percent groundnut processing ventures have reported being constrained in receiving long-term loans. This has forced groundnut processing firms to use their internal financing which is usually unsustainable and increases the vulnerability of ventures as a result of low capital base.

(ii) Inadequate Infrastructural facilities

The performance of groundnut processing ventures has also been hindered by the lack of infrastructural facilities which accounted for about 15.5 %. Inadequate facilities like power supply, telecommunication, accessible road networks and water supply constitute the constraints facing groundnut processing firms after financial problem. A World Bank study in 1989 estimated that "the cost of providing infrastructural facilities by groundnut processing ventures in the absence of those facilities is estimated to be about 15-20 percent of the cost of establishing manufacturing enterprises in Nigeria. Omolola (2008) contended that the percentage has since increased to 30-35 percent of the cost of establishing manufacturing concerns in Nigeria.

Of the infrastructural problems, the problem of lack of power supply has been the most critical. The erratic power supply has hindered the business environment. In Nigeria, most businesses have folded up or cannot operate as result of irregular and epileptic power supply. The problem of power supply is so bad to the extent that the large industries are now relocating to Ghana and other neighboring countries, while majority of the groundnut processing ventures have since gone into extinction. The implication of this is that it has led

to the reduction in production activities. The cost of fuelling generators, machines and equipments has led to cut in employees and increase in running cost of the groundnut processing enterprises. This eventually leads to the folding up of most of these enterprises in Nigeria, since they cannot compete in the market any more.

Most banks have capitalized on this and blamed their inability to fund groundnut processing firms on the poor state of infrastructure, economic climate and low performance of public utilities (Olarenwaju, 2001). However, Chris (2008), of the International Bank in contradiction rejected Banks' excuse on infrastructural facilities, claiming that the huge profits declared by banks' shows that the operating environment is not as bad as they think. The truth however, is that the state of infrastructural facilities in Nigeria is poor. Where infrastructural facilities are neither present, adequate not functional, the investment environment cannot stimulate improvement for groundnut processing ventures.

(iii) Internal Characteristics Problems

Most groundnut processing ventures in Nigeria are battling with serious internal problems. These problems range from poor management practices, poor accounting standards, shortage of manpower, financial indiscipline to corruption and accounted for about 14.3% as shown in Table 4.21. The reasons why most groundnut processing firms have not been able to improve are due to poor management knowledge and practices, absence of transparent organizational set up, poor succession plan, lack of entrepreneurial skills, lack of strategic business plan, et cetera. The dearth of such skills in most groundnut processing firms due to inadequate educational, professional, and technical background on the part of the owners and employees of groundnut processing firms has plunged groundnut processing ventures into further crisis.

It is characteristic of groundnut processing ventures to ignore basic management procedures and thus run businesses as a family affair by undermining proper book keeping and accounting and managerial practices. Because of the way the business management and accountability measures are ignored, reckless financial administration, wrong investment decision and corruption becomes the order of the day (Omolola, 2008).

(iv) Management Problems

Lack of trained manpower and management skills also constitute a challenge to the survival of groundnut processing firms in Nigeria, with about 4.4 frequency of occurrence as shown in Table 4.21. According to West and Wood (2009), '90% of all these business' failures result from lack of experience and competence." Rogers (2013) also added that inefficiency in overall business management and poor record keeping is also a major feature of most groundnut processing firms. Technical problems and lack of essential and required expertise in production, procurement, maintenance, marketing and finances have always led to funds misapplication and wrong and costly decision making.

(v) Socio-Cultural Problems

Most Nigerian entrepreneurs do not have the investment culture of ploughing back profits. Bala (2002) stressed that the attitude of a typical Nigerian entrepreneur is to invest today and reap tomorrow. Also, the socio-political ambitions of some entrepreneurs may lead to the diversion of valuable funds and energy from business to social responsibilities. The problem of bias against made-in-Nigeria goods is significant. Most Nigerians have developed a high propensity for the consumption of foreign goods against their locally-made substitutes.

(vi) Strategic Planning Problems

SMEs often do not carry out proper strategic planning in their operations. Ojiako (2013) stated that one problem of groundnut processing firms is lack of strategic planning. Sound planning is a necessary input to a sound decision-making.

4.7 Test of Hypothesis

The hypotheses for the study are tested using chi-square as follows:

Table 4.22 Chi-Square Test of Hypothesis One (H_{01})

Responses	**Fo**	**Fe**	**Fo – fe**	**$(Fo - fe)^2$**	**$(Fo - fe)^2/fe$**
Yes	100	84	16	256	3.04
No	77	84	-7	49	0.58
No answer	75	84	-9	81	0.96
Total	**252**	**252**			**4.58**

Chi – Square (critical value), $df = 249, \alpha = 0.05$ = 1.02
Source: computed by the researcher

Table 4.23 Chi-Square Test of Hypothesis Two (H_{02})

Responses	**Fo**	**Fe**	**Fo – fe**	**$(Fo - fe)^2$**	**$(Fo - fe)^2/fe$**
Yes	150	126	24	576	4.67
No	102	126	-24	576	4.67
Total	**252**	**252**			**9.34**

Chi – Square (critical value), $df = 249, \alpha = 0.05$ = 1.02
Source: computed by the researcher

Table 4.24: Chi-Square Test of Hypothesis Three (H_{03})

Responses	**Fo**	**Fe**	**Fo – fe**	**$(Fo - fe)^2$**	**$(Fo - fe)^2/fe$**
Yes	90	84	6	36	0.43
No	85	84	1	1	0.012
No answer	77	84	-7	49	0.58
Total	252	252			1.03

Chi – Square (critical value), $df = 119, \alpha = 0.05$ = 1.02

Source: computed by the researcher

Decision

Since the calculated chi- square values are greater than the tabulated value, we reject the null hypothesis and accept the alternative hypothesis. We then conclude that:

(i) The socio-economic characteristics of the Groundnut processing entrepreneurs significantly influenced their economic and allocative efficiencies of the processors in Zamfara State.

(ii) The groundnut oil and groundnut cake processing ventures have impact on poverty levels of the processors in Zamfara State.

(iii) The groundnut oil and groundnut cake processing in the study area are profitable ventures.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study is an investigation of the economic analysis of groundnut processing and its impact on the poverty level of the processors in Zamfara State, with the main focus on groundnut cake and oil processing ventures. It provided insight into the socioeconomic characteristics of groundnut cake and oil processors in the study area, estimates the profitability of the groundnut processing ventures, its economic and allocative efficiencies its impact on the poverty levels of the processors and identify the major constraints faced by groundnut processing firms in the study area.

Primary data for the study were collected using structured questionnaire, administered to 252 groundnut cake and oil processing firms in the study area. Multi-stage sampling technique was employed in selecting the respondents. Data collected were analyzed using descriptive statistics, stochastic frontier function, gross margin analysis and Foster-Greer and Thorbeck model.

Results of the study indicated that majority (66.2 %) of the groundnut cake and oil processors in the study area fell between 20 and 49 years with mean age of 40 years, indicating that middle-aged entrepreneurs were into groundnut processing ventures in the study area. About 53.8 % of the groundnut processors in the study area were experienced in the venture for 1-49 years, the average year of experience being 13.1 %. 15.9 % of the groundnut processors had no formal education, 50.4 % had formal education, 19.8% had quranic education and 13.9% had other forms of education. The average period of education was 8 years.

The study also shows that 27.8% of groundnut processors in the study area were mini- scale processors, 21.9% were micro- scale processors, 19.8 of groundnut processors were small-scale processors and 18.7 were medium- scale processors. About 60 percent of the mini-scale, miro-scale, small-scale and medium-scale groundnut processors had a household size between one and five people and about 41 percent had a household size between six and ten people. This implies that expenditure on food and other household necessities may be minimal since majority of the groundnut processors (59.5) had only 1 to 5 members of household to feed and take care of, which is relatively small. The mean scale for the groundnut processors in the study area is 18.

The result of the study further revealed that groundnut processing is a profitable business with groundnuts cake giving the highest total return of N 1,059,000 per month for all the processors under study, while groundnut oil contributed N 373,500 per month to gross revenue of the groundnut processors under study. A gross margin of N 434,280, which is a measure of profitability, was realized for every 35½ bag of 100 kg size of groundnut processed into groundnut cake and groundnut oil. Thus, groundnut cake and groundnut oil production are profitable to all the groundnut processors in the study area irrespective the scale of operation they operate.

The economic and allocative efficiency analyses indicated that the groundnut processors operate their businesses with different levels of efficiencies. The average economic and allocative efficiencies were 0.36 and 0.51, respectively.

The result of Foster-Green and Thorbeck measure of poverty revealed that, by engaging in groundnut processing businesses in the study area, the number of groundnut processors living below the poverty line has been reduced from 39 % to 35 % while those living above

the poverty line has been increase from 61 % to 65 %. Also, the poverty line, poverty head count, depth and severity which were N 1198.40, 87 %, 29 % and 19 % respectively fell to N1173.94, 35 %, 24 % and 16 % respectively. Hence groundnut processing business could be said to have positive impact on the wellbeing of the processors in the study area.

Some constraints hindering the performance of the groundnut processors include inadequate finance, inadequate infrastructural facilities, managerial problems, socio-cultural problem, and internal characteristics problems.

5.2 Conclusion

This study revealed that groundnut processing ventures have positive impact on the poverty levels of the processors in the study area. This was confirmed by the result of the Foster-Greer and Thorbeck model of poverty, which shows a reduction in the number of groundnut processors living below the poverty line after engaging in the groundnut processing businesses. The gross margin analysis gave a positive gross margin value, indicating that the returns from the groundnut processing businesses in the study area are higher than its costs of inputs. Therefore, the groundnut processing business is profitable.

The economic and allocative efficiency analyses indicated that the groundnut processors operate their businesses with different levels of efficiencies, with the average economic and allocative efficiencies being 0.36 and 0.51 respectively. The average values suggest that some scope exist for the groundnut processors to increase their level of economic and allocative efficiencies by allocating the input resources optimally. Furthermore, the analysis of the frontier function showed that the major input variables influencing groundnut processing were labour, costs of groundnut, output of groundnut, depreciation. These results imply that in order to improve performance in groundnut processing, there is need to

improve the quality of labour, charged a faire price, and improved the quality of the processed products.

Results of the determinants of allocative and economic efficiency indicated that groundnut cake and oil processing entrepreneurs' socio-economic variables should be considered as significant factors influencing their efficiency in groundnut processing. Findings from the study are that there is ample opportunity to increase the present level of efficiency for groundnut processing in the study area. This can be achieved through improved socio-economic factors which include the groundnut processors' education level, scale of operation, quality groundnut seed and other processing inputs. Despite the benefit that higher efficiency levels can have on output however, productivity gains stemming from technological innovation remains of critical importance in groundnut processing.

5.3 Recommendations

Based on the findings and conclusions of the research, some policy recommendations that will help in improving upon the level of groundnut processing and ameliorating the identified constraints are proffered.

(i) Most socio-economic attributes of the groundnut processors investigated had meaningful bearings on the processors' ability to procure and use the processing inputs. Hence, government agencies should distribute inputs timely and at affordable prices so as to enhance productivity in the groundnut processing ventures.

(ii) Since the coefficient of labour and that of education are positively related to output increasing level of utilization of these inputs will increase the output of

groundnut processing in the study area. The groundnut processing entrepreneurs should therefore be encouraged to improve on the use of these inputs.

(iii) The mean level of allocative efficiency (0.589) and economic efficiency (0.889) were below the optimum level. This indicates that there is scope for increasing the level of allocative and economic efficiencies by 41 % and 11% respectively through the adoption of efficient and improved methods such as using skilled labour and improved groundnut seeds.

(iv) Education was found to have contributed in increasing economic and allocative efficiencies in groundnut processing in the study area. Therefore all policy measures that build the educational capacities of the groundnut entrepreneurs and strengthen their managerial capacities will enhance greater performance of the groundnut entrepreneurs. For example, adult education could be introduced in rural parts of the study area as part of these progrmme.

(v) Inadequate capital was found to impede groundnut cake and oil processing in the area. Hence, government and concerned organizations should effectively link groundnut cake and oil processors to available financial institutions for the provision of on-lending short and long term credit facilities. These financial institutions can also provide advisory role to the processors to ensure prudent management of such facilities.

(vi) In addition, the groundnut processors could help themselves by forming an interest group that can stand on their behalf and put their request before the government. Such requests should put pressure on the government to provide

adequate rural infrastructure such as markets, feeder roads and other social amenities. This should be done in order to promote good investment climate for the commercial development of groundnut cake and oil processing in the study area.

5.4 Contribution of the Study to Knowledge

The study revealed that groundnut processing is a worthwhile business which businessmen need to explore in order to increase their income level economic and welfare. This research differed from previous studies in the following ways:

i. The use of Foster-Greer Thorbeck model of poverty measure distinguished this study from the previous ones in related topics where used were made of Purchasing Power Parity (PPP) for measuring poverty level. The Purchasing Power Parity (PPP) was considered inefficient because of frequent fluctuation in exchange rate, especially in Nigeria where this study is conducted. The Foster-Greer Thorbeck model used information on the socio-economic characteristics of the respondents, which are easily generated directly from the respondents. Its result shows a 4% reduction in the poverty level of the respondents that are engaged in the groundnut processing ventures in the study area. The Foster-Greer Thorbeck model provides a more realistic measure of poverty than the Purchasing Power Parity (PPP).

ii. The estimation of the profitability analysis shows how primary data sourced through questionnaires can provide opportunity to make forecast and prediction based on available data. The analysis worked out and established separate total

revenue for groundnut cake and groundnut oil, compared their sum to total costs off inputs and arrived at a positive margin, which is a measure of profitability.

iii. Groundnut processors operate with different level of efficiencies which are beset with various constraints which hindered their ability to be productive. Financial problem ranked first with 61.5%, limited infrastructure ranked second with 8.7%, managerial problem ranked third with 8.2%, while policy inconsistency is the least constraint with 1.9%. Those who were co-operative members reaped benefits of membership which contributed immensely in overcoming such constraints and improve on processing efficiency.

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APPENDIX I: RESEARCCH QUESTIONNAIRE

SECTION A: Socio-economic Characteristics of the Respondents

1. **Name** (optional):

2. **Age** : 20-29 [ ], 30-39 [ ], 40-49 [ ], 50-59 [ ], 60-69[ ]

3. **Sex:** male [ ] female [ ]

4. **Highest level of education:**

No formal education [ ] quranic education [ ] primary education [ ]

Secondary education [ ] adult education [ ]

5. **Years of experience**

1 - 10 [ ], 10-19 [ ], 20-29 [ ], 30-39 [ ], 40-49 [ ]

6. **Scale of operation adopted**

Mini- scale processors [ ]

Micro- scale processors [ ]

Small- scale processors [ ]

Medium-scale processors [ ]

7. **Sources of groundnut**

Local market [ ]

Owned farm [ ]

Research institute[ ]

Others [ ]

8. Sources of labour

Family labour [ ]

Hired labour [ ]

Both family and hired [ ]

Communal labour [ ]

Others [ ]

9. Number of labour used per month

Scale of operation	**number of labour**
Mini- scale processors	…….
Micro- scale processors	…….
Small- scale processors	…….
Medium-scale processors	…….

10. Household size

Scale of operation	**number of Household size**
Mini- scale processors	…….
Micro- scale processors	…….
Small- scale processors	…….
Medium-scale processors	…….

11. Household consumption expenditure per month

Scale of operation	**Household consumption expenditure**
Mini- scale processors	N ……. to N……
Micro- scale processors	N ……. to N……
Small- scale processors	N ……. to N……
Medium-scale processors	N……. to N……

12. Quantity of 100 Kg bags of groundnut processed per month

Scale of operation	**100 Kg bags of groundnut processed**
Mini- scale processors	…….
Micro- scale processors	…….
Small- scale processors	…….
Medium-scaleprocessors	…….

SECTION B: Profitability Analysis

13. Do you considered returns from the business per month greater than the costs?

Yes [ ]
No [ ]

14. If yes, by what margin per month (estimate)? ……

15. Given the profit level, will you say that groundnut processing business has benefited you and your household?
Yes [ ]
No [ ]

16. Kindly complete the table below on the inputs used, the quantity and the costs

Inputs	**Quantity per month**	**Costs**
Groundnut (in 100 Kg bag)		
labour (hired)		
salt (satchet)		
pepper (kg)		
water (litre)		
Griding		
Frying		
Fixed Inputs		
Mutter		

Wooden Pestle

17. Which of the groundnut processing inputs used has the highest cost? ……..

18. Which of the groundnut processing inputs used has the least cost? ……

19. What is your estimated monthly revenue from groundnut cake? N ……..

20. What is your estimated monthly revenue from groundnut oil? N ……..

21. What other income source do you have? Specify ……

SECTION C; Poverty Analysis

22. In your opinion what is poverty? ……..

23. From your understanding of poverty do you considered yourself poor?
Yes [ ]
No [ ]

24. How do you rate your welfare before engaging in groundnut processing business?
Unsatisfactory [ ]
Satisfactory [ ]
Highly satisfactory [ ]

25. How do you rate your welfare after engaging in groundnut processing business?
Unsatisfactory [ ]
Satisfactory [ ]
Highly satisfactory [ ]

26. What is your monthly expenditure on
(a) Food N……
(b) Health care N …….
(c) Education N ……...
(d) Rent N……
(e) Others N…….

Is your monthly earning enough to take care of your monthly expenditure?
Yes [ ]
No [ ]

27. If no, how do you complement your monthly expenditure? ……..

28. Would you say that groundnut processing ventures have contributed to poverty reduction among the processors in Zamfara State?

Yes ( )
No ( )

29. If yes, how? ……

30. Suggest other ways you think poverty can be mitigated

(a) ……..

(b) ……..

(c) ……

SECTION D: Constraints to groundnut processing ventures

31. Does Groundnut processing ventures in Zamfara State faced any kind of constraint**?**

Yes ( )
No ( )

32. Mention the constraints

(a) …….

(b) …….

(c) …….

(d) …….

(e) ……..

33. Given the above challenges, what do you think is the reason why the rural population still engaged in small-scale groundnut processing enterprise?

a. For family survival ( )
b. interest ( )
c. Convenience ( )
d. Others ……..

34. What other product processing ventures does small- scale businesses in Zamfara engaged in? Specify….....

35. What is the major source of groundnut to the small- scale processors in zamfara state?

a. Personal farm ( )

b. Family farm ( )

c. Cooperative farm ( )

d. Community farm ( )

e. Market ( )

36. Are you a member of any Cooperative society or association?

Yes ( )
No ( )

37. In what ways have you benefited from membership of cooperative society?

a. Loan
b. Others (specify)……..

38. What are the major sources of capital to groundnut processing firms in Zamfara State.

a. Personal savings ( )

b. Friends and relatives ( )

c. Cooperative ( )

d. Money-lenders ( )

e. Bank loan ( )

39. How many staff do you have?
Please specify:…….....

40. Has there been any infrastructure introduced to your community because of small businesses around?
Yes [ ]

No [ ]

41. If yes, what are they?

a. Roads/bus stops
b. Street lights
c. Housing projects
d. Electricity
e. Others (please specify)……..

42. Do you suggest that government should encourage and create opportunities for small business in other parts of the state?

43. If yes, why ……
44. If no, why……
45. Please feel free to add any additional comment you may want to add:

……

……

……

……

Thank You for your Time

APPENDIX II: FREQUENCY DISTRIBUTION

Number of workers Employed

		Frequency	Percent	Cumulative Percent
Valid	less than 10	84	62.0	62.0
	greater than 10	25	22.5	84.5
	None	11	15.5	100.0
	Total	120	100.0	

Any infrastructure introduced to your community because of small businesses

		Frequency	Percent
Valid	Yes	91	70.5
	No	27	28.5
	4	2	1.0
	Total	120	100.0

If yes, what are the infrastructures?

		Frequency	Percent
Valid	road or bus stop	96	53.0
	street light	15	7.5
	housing projects	1	.5
	electricity	11	10.5
	others	4	2.0
	Total	107	73.5
Missing	System	33	26.5
Total		120	100.0

Should the government encourage and create opportunities for small businesses elsewhere in the state

		Frequency	Percent
Valid	Yes	118	99.0
Missing	System	2	1.0
Total		120	100.0

A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY DEGREE IN AGRICULTURAL ECONOMICS

DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY
FACULTY OF AGRICULTURE
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ZARIA, KADUNA STATE
NIGERIA

FEBRUARY, 2016

DECLARATION

I hereby declare that the work in this thesis titled "**Economic Analysis of Groundnut Processing (Oil and Cakel) and its Effects on Poverty Level of the Processors in Zamfara State, Nigeria"** has been written by me and is a record of my research work. No part of this work has been resented in any previous application for another degree or diploma at any institution. All borrowed information have been duly acknowledged in the text and a list of references provided.

_____ _____

Nasiru Alhaji YA'U **Date**

CERTIFICATION

This Thesis titled: "**Economic Analysis of Groundnut Processing (Oil and Cake) and its Effects on Poverty Level of the Processors in Zamfara State, Nigeria"** by **Nasiru Alhaji YA'U** meets the regulations governing the award of the degree of Doctor of Philosophy in Agricultural Economics of the Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

_____ _____

Prof Ben Ahmed **Date**
Chairman, Supervisory Committee

_____ _____

Dr O. Yusuf **Date**
Member, Supervisory Committee

_____ _____

Prof J.G. Akpoko **Date**
Member, Supervisory Committee

_____ _____

Prof Z. Abdulsalam **Date**
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_____ _____

Prof K. Bala **Date**
Dean, School of Post Graduate Studies

DEDICATION

This work is dedicated to my late father, Alhaji Ya'u, Galadiman Kaura for his moral and financial supports and all that matters in child upbringing till his death. May his soul rest in peace.

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ABSTRACT

This research carried out an economic analysis of groundnut processing and determined its effects on the poverty level of the processors in Zamfara State, with main focus on groundnut oil and cake processing ventures. The multi-stage sampling procedure was used in selecting sampled groundnut oil and cake in the study area. The research adopted a survey method by using questionnaire to collect primary data from the respondents. The primary data collected for the study were analyzed using descriptive statistics, stochastic production frontier, Foster-Green and Thorbeck model and gross margin analysis. The result showed that, on the average, the socio-economic characteristics of the groundnut oil and cake processors in the study area influenced their poverty level. It was also found that the overall total costs of processing groundnut per month was N998, 220 while the overall total revenue was N1,432,500. The gross margin of N 434,280 was realized, suggesting that groundnut processing is a profitable venture in the study area irrespective of the scale of operation adopted. Also, the mean level of allocative efficiency (0.589) and economic efficiency (0.889) were found to be below the optimum level, suggesting that there is scope for increasing the level of allocative and economic efficiencies by 41 % and 11% respectively through the adoption of efficient and improved technologies. Also, education was found to have contributed in increasing economic and allocative efficiencies in groundnut processing in the study area. The result of poverty analysis showed that by engaging in groundnut processing business in the study area, the number of respondents living below the poverty line has been reduced from 39 % to 27 %. Also, the poverty line, poverty head count, depth and severity which were N 1198.40, 87 %, 29 % and 19 % respectively falls to 1173.94, 27 %, 21 % and 11 % respectively, indicating that groundnut processing businesses have positive impact on the well being of the processors in the study area. Also, inadequate capital was found to impede groundnut cake and oil processing in the area. Therefore all policy measures that build the educational capacities of the groundnut entrepreneurs and strengthen their managerial capacities will enhance greater performance of the groundnut entrepreneurs. The government and concerned organizations should effectively link groundnut cake and oil processors to available financial institutions for provision of credit facilities. These financial institutions can also provide advisory role to the processors to ensure prudent management of such facilities. In addition, the groundnut processors could help themselves by forming an interest group that can stand on their behalf and put their request before the government. Such requests should put pressure on the government to provide adequate rural infrastructure and other social amenities. This should be done in order to promote good investment climate for the commercial development of groundnut cake and oil processing in the study area.