

CENTRAL NIGERIA - researchcub.info **ABSTRACT**

The study evaluated the traditional and modern groundnut processing and marketing in North Central Nigeria. The focus was on groundnut oil processing and marketing systems; input use efficiency in production and factors that made for efficiency; profitability of the processing activity and factors that determined profitability; examination of value added by processing; integration of markets for the processed products and problems of the industry. A total of 175 traditional processors were selected and 17 small-Scale modern processors covered from Nasarawa, Benue and Niger States. Pre-tested, structured questionnaires and observations were used as instruments of data collection. Types of data collected were those on socio-economic characteristics of processors, groundnut procurement, processing, and ground nut oil (GNO) and groundnut cake (GNC) marketing. Weekly price series for GNO and GNC were also collected at various markets within the region. Data analyses were attained by use of descriptive and inferential statistics, stochastic frontier analysis (SFA), profit function analysis, t-test statistic and Johansen test for co-integration. Hypotheses were also tested appropriately. The average age of traditional processors in North Central Nigeria was 38 years and 41 years for modern processors. Ninety-four percent of the traditional processors were women while 88% of modern processors were men. Majority of the processors did not participate in co-operative activities.

Sixty percent of groundnut processed by traditional processors came from farmers while 94% of groundnut processed by modern processors was obtained from traders. The maximum likelihood result for traditional processors indicated the presence of inefficiency. Raw groundnut variable was significant at 1% level of significance (LOS) in Nasarawa and Niger States. Fuel-wood and salt were both significant at 1% LOS in Nasarawa and Benue States. In the inefficiency aspects, age and years of experience were significant at 1% LOS in all the states. For the zone, labour and salt were significant at 1% LOS; fuel-wood 5% and raw groundnut 10% LOS. In the inefficiency aspect for the zone, household size was significant at 5% LOS, while level of education was significant at 10% level of probability. Raw groundnut and labour were significant in modern processing, while education and experience at 10% in the inefficiency aspect. Most of the traditional processors had their efficiency scores above 0.80 and modern processors were from 0.47. In the profit function results for traditional processors, fuel-wood and packaging variables were significant at 1% LOS. Raw groundnut, procurement and maintenance were significant at 1% in modern processing. Value added was 41% for traditional processors and 44% for modern processors. There was significant difference in the value of groundnut before and value after processing. The Johansen trace test result indicated five co-integration vectors at 5% level of probability for GNO and two co-integration equations for GNC. The markets for GNO and GNC were not fully integrated. Administrative regulations affected market integration for GNO which was significant at 5% LOS. Constraints identified included inadequate finance, inadequate electricity, machine breakdown and transportation. Recommendations made included improved packaging, finance, electricity supply and co-operative education.

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CHAPTER ONE INTRODUCTION

1.1BACKGROUND OF THE STUDY

Processing, storage and marketing of agricultural produce have become increasingly important to the economies of most developing countries, as they have been to industrialized nations at various stages of their development. Due to technical progress, marketable surpluses from agricultural production have grown significantly; while rapid growth in urban populations and rising per capita incomes have enlarged and diversified the demand for processed agricultural products, whether food or raw materials for industries. Perhaps Processing is one of the most important physical functions of agricultural marketing. Olayide & Heady (1982) opined that processing was an important component of agribusiness development, because a large portion of farm production underwent some degree of change between harvesting and final use. More so agro-processing is capable of strongly shaping farm production decisions. It enables quality enhancement, preservation and differentiation of farm production thereby enhancing its marketability. It has also been noted that Agricultural processing activities are small-scale and require low investment capital, hence can easily be undertaken by women (Fellows & Hampton, 1997; RMRDC, 2004; Kadurumba, Kadurumba & Umeh, 2009; FAO, 2011).

Farm products' processing play a significant role in the economies of developing countries, where it accounts for between 51% and 60% of value added by manufacturing and between 60% and 70% of total industrial development. Over half of the manufacturing

activities in the developing countries of the world consist of agro-industries preserving and transforming agricultural raw materials (Olayide & Heady, 1982; Brown, 1986). FAO (2012) observed that increased urbanization, distance between home and work-place, working women and changes in family cohesion has increased demand for shelf-stable, convenience and value added food.

Agricultural processing facilities have a strong impact of stimulating consumer demands backward to the farm sector, to keep pace with demand for raw materials supply for processing. Based on farm products, agricultural processing schemes can be sited in areas where other industries will not be viable, as they are more intensive users of domestic rather than imported raw materials due to their local availability (Brown, 1986; Austin, 1992; Brown, Deloitte & Touche, 1994). More importantly, the gains of increased agricultural production through technical progress will be lost if it is not consolidated through the development of economically viable processing sector. So also the skills developed through planning and implementation of agricultural processing and preservation will strengthen stakeholders' entrepreneurial attributes, thereby enhancing their economic empowerment (FAO, 2011). As a means of mitigating problem of food shortage, FAO (2012) among other issues emphasized adding value or improving the food agro-processing for consumption and the market.

An efficient marketing system connects producers and consumers, directs efficient allocation of resources in production and distribution of output, while ensuring maximum economic benefits to participants. Conceptually, agricultural processing which is a segment in agricultural marketing, involves the transformation of raw materials to the forms required by the consumer or for the next stage in a manufacturing and distribution chain (Olukosi & Isitor, 1990; Boland, 2009). This entails transforming and preserving agricultural output, through physical and/or chemical alteration. FAO (2011) defined food processing and preservation as a set of physical, chemical and biological processes that are performed to prolong shelf-life of foods, and at the same time retain the features that determine the quality, such as colour, texture, flavour and especially its nutritional value. Austin (1992) also viewed agricultural processing industry as any enterprise that is involved in the processing of materials of plant or animal origin, which he also described as agro-industry. In the World Bank development activities, the term "agro-industry" covered agro-industrial processes such as grain milling, fruit and vegetable canning, oil seed crushing, and meat packaging as well as the function of marketing (Brown, 1986). Hence it was touted that starting a small rice mill or an oil press marked a nearly stage in the first steps on the road to industrialization. The nature of processing and level of transformation can vary tremendously ranging from cleaning, grading and boxing fruits and milling to oil extraction, mixing and chemical alteration (Austin, 1992), (Table 1.1).

Groundnut (*Arachis hypogea*) is known to the Hausas as 'Gyadda', to the Ibos as 'Opapa', the Yorubas as 'Epa', the Americans as peanuts, and the French as arachides. It is a leguminous crop grown all over the world as an important oil seed crop native to South America. Groundnut is thought to have been introduced to West Africa early in the slave trade by the Portuguese, mainly to supplement the diet of slaves in transit. Its spread into the interior of West Africa was rapid in the eighteenth century. By 1850s it was common in parts of Hausa land of Nigeria and thought to be as important as potatoes in Europe by a British traveler (Hogendorn, 1978). Groundnut is a short herbaceous annual crop that produces its pods inside the soil, (figure 1.1).

Historically, the Sudan and northern guinea savanna of Nigeria have been the high producing zones. However, the development of several varieties by the Institute for Agricultural Research (IAR), Ahmadu Bello University, Zaria, has led to even higher output in the southern guinea savannah zone, covering the North Central States of Nigeria (RMRDC, 2004). Nigeria was third among the world ten highest producers of groundnut with 3, 835,600 tonnes (unshelled) after China and India in 2007/2008 output year (USDA, 2010), but now fourth with 1.55 million metric tonnes (shelled) in the 2008/2009 output season (USDA, 2010),

(Table 1. 2).

A mature groundnut pod contains 2-4 kernels (nuts) per pod depending on the variety and is traded decorticated and unshelled. In Nigeria, it is eaten as whole nut, raw, boiled or roasted and also crushed to get the oil and the cake. The oil is known as groundnut oil (GNO) and the residue known as groundnut cake (GNC). Groundnut is rated the third major oil seed of the world after soya bean and cotton (USDA, 2010). Groundnut oil is used for cooking, as salad oil, for canning sardines, and margarine manufacturing (Sharma & Caralli, 2004). The residue after oil extraction is a source of protein for animal feed. In traditional oil extraction method, this residue is fried into a local delicacy known as groundnut cake (GNC) or 'kulikuli' in Hausa. This is ground and consumed in composite with several local dishes. Elsewhere, groundnut is processed into peanut butter, peanut flour, peanut flakes and many other products.

Bulk export of groundnuts from Nigeria started to decline in the 1960s in favour of local crushing by mills in and around Kano and elsewhere. In 1973/74 cropping season, only 35% of the 559,000 metric tonnes purchased by the marketing board was exported. By 1973/74 also a policy decision to discontinue export of groundnuts entirely was put in place to allow for local processing. Any export of groundnut after then was in form of groundnut oil (GNO) or cake (GNC) (Hogendorn, 1978).

The petroleum oil boom and its consequence upon the agricultural sector saw Nigeria importing groundnut oil. In 1980, about 200,000 tonnes of groundnut products were imported in form of vegetable oil. The 1.95 million tonnes output in 1974 dropped to 0.4 million tonnes in 1983. Consequently many groundnut processing mills had to close down because of unavailability of the raw material (RMRDC, 2004). However, with the abolition of organized marketing of agricultural products in 1986, the processing and marketing of groundnuts and its products have been left to the private sector (Ingawa, 2004). A survey by RMRDC (2004) showed groundnut output to be 1.98 million tonnes for 2003, with greater portion coming from Bauchi and Nasarawa States with 72,000 tonnes and 70,420 tonnes, respectively, and higher estimates for 2004. The rain fed output for Nasarawa State in 2008 was put at 92,450 metric tonnes (NADP, 2009). The soaring demand for groundnut oil in manufacturing and domestic need has kept the pressure on the groundnut crushing industry.

1.2 STATEMENT OF THE PROBLEM

Agricultural development policies and programmes have tended to lay emphasis on improving farm productivity, but with less attention on the processing and storage of the resultant output. For instance, 95% of funding of the Consultative Group on International Agricultural Research (CGIAR) in about 20 to 30 years was devoted to production related research activities (Ferris, 1999). Agricultural credit disbursement in Nigeria has also been in favour of crop production with grain alone taking 67% (CBN, 1998). Consequently, the gains of increased agricultural productivity will not be fully realized if not sustained through the development of a viable processing and marketing sector to support the technical progress attained in production. Market forces have instigated greater opportunities for product differentiation and value addition in some respects (Boland, 2009). These include i) increased consumer demand regarding health, nutrition, and convenience food; ii) efforts by food processors to improve their productivity; and iii) technological advances that enable producers to produce what consumers and processors/manufacturers desire. Importantly, improvement of efficiency in the value chain fosters more equitable, transparent and sustainable distribution of benefits to the various stakeholders (FAO, 2011)

Local processing of groundnut and other sources of oil have still not met the domestic demand for vegetable oil. This is shown in the importation of vegetable oil to supplement local production, with its attendant drain on foreign exchange. The short fall in demand has been estimated at between 300,000 tonnes and 400,000 tonnes per annum. Hence the Presidential Initiative on Vegetable Oil was put in place, to obtain three million tonnes of vegetable oil per annum from five million tonnes of groundnut and to start exportation by the year 2010 (Ojowu, 2004). Consequent upon the above, the challenge of achieving this target

was on the groundnut processing industry. Hence this study focused on critical areas in groundnut processing and products marketing chain for appropriate intervention measures to achieve efficiency and increase products availability.

In agricultural processing schemes as in production, several inputs are involved. Raw material that is the farm produce can constitute 90% of the entire inputs needed depending on the level of processing (Austin, 1992). The efficiencies involved in transforming inputs into desired output need be known (Olayide & Heady, 1982). One of the problems responsible for poor performance of developing countries especially in sub-Saharan Africa in international trade is attributed to low value addition. Consequently, products do not meet international standards, and do not compete favourably in the international trade. Optimization of groundnut oil (GNO) and groundnut cake (GNC) processing and marketing, is therefore an ultimate desire.

It is also understood from the foregoing that there are information and product gaps in the value chain with respect to groundnut oil, all pointing to inefficiency along the value chain. Most technical and economic efficiency studies have concentrated on primary production of crops and livestock with few on processing, for example Okoh, (1999) worked on cassava roots and its processed products. Kadurumba, Kadurumba & Umeh, (2009) also worked on allocative efficiency of traditional palm oil processing in Imo State. Analysis of technical and economic efficiency data from processing through marketing, with its positive effects in the chain, and integration of markets for processed products is crucial, but unavailable. Consequently, this research has addressed the inefficiencies in the value chain, as depicted in capacity under utilization of plants, poor quality products, low quantity of output from given level of raw material, inadequate price and output information, unattractive profit incentives, and income fluctuations.

It has been established that initiating activities from the market – end of the commodity value chain, using improvements in processing and market expansion to provide “demand pull” that benefits raw material producers, especially small-holder farmers, is necessary for sustainable agricultural development (Ojowu, 2006). A survey by RMRDC (2004) revealed Nigerian’s groundnut output of 1.976 million tonnes. With the entire crop consumed in Nigeria, examining the performance of the processing segment and hence the downstream segment of groundnut industry will improve efficiency in operations for processors, and entire value chain.

The synchronous movement over time among prices in different markets has become an important index of efficiency in the markets. For a market system, domestic or foreign, efficient performances of its developmental functions depend on the ease with which price changes and responses are transmitted spatially and temporally within the system. Market integration modeled within the framework of the spatial price equilibrium (SPE) model of inter market linkages in the point space tradition, that is subject to production shocks and general price information is crucial for attainment of efficiency of the markets. The poor infrastructural development in developing countries as Nigeria leaves lots of doubts in the attainment of integration of the markets for agro-industrial products, such as groundnut oil and groundnut cake and hence the much desired efficiency in their marketing systems. Acquah & Owusu (2012) suggested further investigation into influence of external factors such as market infrastructure, government policy and self sufficient production, product characteristics and utilization towards market integration.

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