EXPANDING EXPORT OF SESAME SEED AND SHEANUT/BUTTER THROUGH IMPROVED SPS CAPACITY BUILDING FOR PUBLIC AND PRIVATE SECTOR

SOCIO-ECONOMIC CHARACTERISATION OF SESAME VALUE CHAIN IN NIGERIA

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1. SOCIO-ECONOMIC CHARACTERISATION OF SESAME VALUE CHAIN IN NIGERIA

EXECUTIVE SUMMARY

Sesame is one of the crops that are produced mainly for export in Nigeria. With plans by Nigeria to penetrate the European market, it is important to address all those issues that may become impediment to sesame exports from the country. To this end, a project was funded by World trade Organisation with major goal of expanding Nigeria's exports of sesame seed through improved Sanitary and Phyto-Sanitary (SPS) capacity building for Private and Public Sector Organizations and improved quality control along the supply chain. The project has five main component activities. The main objective of the first component was to improve documentation for current practices of quality control for sesame seed for exports with a focus on field level production, processing, storage, transport to ports of export.The study presents the report of the socioeconomic characterisation of sesame in five states where sesame is produced in commercial quantities.

The objectives were:

- to identify producing areas, volumes produced, local consumption and export.
- to determine current production practices, organization of production and supply chain
- to identify critical hazard control points in the supply chain.

In order to accomplish these objectives, field surveys were conducted in some producing states in March 2011. The states were: Benue, Borno, Kogi, Nasarawa and Taraba. Information was collected through interview schedules with government officials, producers and marketers in order to understand the process from production through to the distribution and export of commodities. Data were analyzed using descriptive statistics and gross margin analysis. Analysis of socioeconomic characteristics showed that a larger proportion of sesame farmers were male with average age of 42 years. About one-third of the respondents did not attend formal educational schools/institution. Average number of household members participating in farm activity was 10 persons.

Results of production analysis indicated that sesame is produced in commercial quantity in twelve states: Nasarawa, Jigawa, Benue, Taraba, Yobe, Bauchi, Borno, Kano, Plateau, Kogi, Kebbi and the Federal Capital Territory. About 168,000 metric tons of sesame seeds was produced from the twelve states in 2010, out of which 138000 metric ton was exported while 30,000 metric ton was consumed

locally (NSSAN, 2011). An average farm size of 4.9 hectares was put to sesame production. Land for sesame production is mainly acquired through inheritance. Broadcasting is the most common method of planting. Sole cropping is adopted by 65 percent of farmers. The duration of the varieties grown ranges from 3 to 4 months. Weeding is generally carried out by manual labour. Fifty six percent of the sesame farmers use fertilizers. Pesticides are applied by 31 percent of the farmers. This is attributed to the low level of pest infestation in the area. Harvesting is generally carried out in October. Harvested sesame is dried on the field by stacking for a period of two to three weeks. The mean yield of sesame is 434 kilogram per hectare. Only 16 percent of the sample farmers have exposure to improved sesame production technologies. Post-harvest activities like threshing, winnowing and cleaning were manually carried out. The clean seeds are packed inside polythene bags and stored in the houses before selling to the buyer.

The period of storage ranges from one to twelve months. The average storage period was four months. Storage pest infestation is rare in the study area. The gross margin per hectare was N9, 190.00 and the net income was N1, 189.25. Since the value of the two indicators were positive, sesame production can be considered profitable in the study area. The return per each Naira invested was 0.15 and the net cash per variable cost was 0.02 revealing that the sesame farming was slightly cost-effective. On average, the proportion of total production offer for sale is 0.81. This means that sesame is produced mainly for sale in the study area. Sesame is sold throughout the year; however, about 60% of farm households sell their produce within the first three months after harvest. In general, sesame seed is sold at the local market place. Means of transportation of sesame to the market were generally by motorcycle and vehicle. This implies that good road is necessary for sesame marketing. Transport cost ranges from N500 to 1500 per ton from the market place to the stores/warehouse. Sesame is directly sold either to consumers, or to marketers (collectors and resellers). Pricing for produce at the farm gate is based on bargaining, and varies from one market place to the other. Price of sesame seeds is set according to the season of the year. This ranges from N14, 000 to N18, 000 per 100kg bag during harvesting and slack period respectively. The average price per season in the study area was N15, 366.67. Men predominantly handle assemblage and transportation of sesame seeds from local market to export storehouse. Most of the marketers procure sesame directly from the farmers.

Sesame is procured from various locations and assembled in the local market for further processing into exportable products. Average turnover by marketers was N20,688,937 per season. The gross commercial margin was N26, 241 per ton while the gross export margin was N11, 000 per ton.

Sesame retail marketing was more profitable than exporting venture. This is mainly attributable to high cost of transportation to the port, and low *fob* pricing. Major constraints facing sesame farmers were low yield, low profit, inadequate capital, high cost of transportation, low exposure to improved production technologies, poor roads, inadequate training, inadequate supply and high cost of fertilizer, inadequate financial incentives and lack of modern processing facilities. Marketers also face the following constraints: lack of financial incentives, high cost of transportation, poor roads, multiple taxation, lack of modern processing facilities, inadequate capital, inadequate training, insufficient access to market information and poor pricing of produce.

1.1. INTRODUCTION

1.1.1. Sesame Seed Production and Quality Control

Sesame (*Sesamum indicum*) belong to the plant family Pedaliaceae. It is one of the world's oldest oil seed crops grown mainly for its seeds that contain approximately 50% oil and 25% protein (Burden, 2005). The presence of some antioxidants (Sesamun, Sesamolin and Sesamol) makes the oil one of the most stable vegetable oils in the world. Africa accounts for 25% of the world sesame production and Nigeria is the 5th largest producer of the commodity in the world with an estimated production of 120,000 metric tones annually. The global export for the commodity amounted to 900,000 metric tonnes while Nigeria exports about 80,000 metric tonnes annually valued at US$68.0 million. Sesame is mostly exported as seed and major destinations for export include China, Japan, Syria, European Union, Korea, Turkey and the Middle East. Sesame has a potential for earning additional foreign exchange for the country if opportunities in the European Union could be exploited.

Sesame seed is frequently contaminated during storage by high levels of aflatoxins (B1, B2, G1, G2), which are toxic secondary metabolites produced by *Aspergillus flavus*/*A. parasiticus* when seeds are kept under conditions that favour the development of these fungi. With plans by Nigeria to penetrate the EU market, aflatoxin control may become the largest impediment to sesame exports from Nigeria, especially to Europe where the regulation on aflatoxin levels has become very restrictive. The need for a strict quality control system for sesame is therefore a *sine qua non*. Currently, there is no specific quality assurance package developed and tailored for sesame seed field production through the supply chain to export. and neither is there evidence that a plan of Hazard Analysis and Critical Control Points (HACCP) is practiced by sesame seed processors and exporters. There is also no existing /operational platform in place to facilitate collaborative efforts of all responsible agencies required to ensure quality export production. This study is an attempt to address the issues of quality improvement along the supply chain for sesame seed.

1.1.2. Objectives of study

The main objective of the study was to improve documentation for current practices of quality control for sesame seed for exports with a focus on field level production, processing, storage, transport to ports of export. The specific objectives of the study were:

to identify producing areas, volumes produced, local consumption and export.

to determine current production practices, organization of production and supply chain.

to identify critical hazard control points in the supply chain.

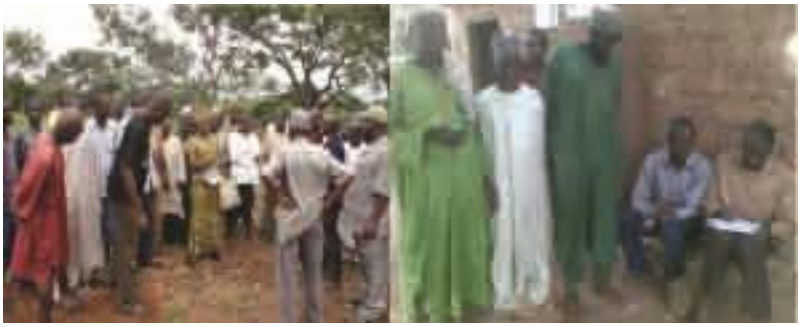
1.2. RESEARCH APPROACH

1.2.1. Data Source

The study was conducted in five states, namely: Benue, Borno, Kogi, Nasarawa and Taraba located in the northern part of Nigeria. Northern region accounts for more than half of the total sesame output produced in the country. The choice of the five states was based on the level of sesame output and long experience in production and trading of sesame in the country. Although Nasarawa state was not listed among the states to be surveyed, it was purposely included mainly for the marketing data collection due to insufficient marketing respondents in other four states listed. Doma, Lafia and Obi in Nasarawa state are among the major sesame export assembling centres in the country.

1.2.2. Data Collection

Cross sectional primary data was used in this study. Data were collected between March and April 2011 through a survey of sesame farmers in the study area. The main instruments for data collection were well structured questionnaires (Annex 1) administered on farmers by trained enumerators under the supervision of the research experts. Group interview was conducted to generate general information peculiar to the village (Plate 1). The data collected covered only production and marketing activities for 2010 cropping season. These include: farm inputs, quantity and value of sesame outputs and prices of various inputs used. In addition, data were collected on farmers' socioeconomic and demographic variables such as age of farmers, education level of farmers, household size and, land ownership status.



a b

Plate 1: Farmers' group (a) and individual (b) interview session

1.2.3. Sampling Technique

The study employed a multi stage sampling technique to select the representative sample of farmers. The first stage involved selection of five states - Benue, Borno, Kogi, Nasarawa and Taraba -

from the list of states where Sesame is produced in the country. In the second stage, Local Government Areas (LGAs) were randomly selected from the five states based on probability proportionate to size (Table 1). The third stage involved random selection of farmers from the villages selected from each LGAs, again based on probability proportionate to size. Sesame traders were interviewed in the villages selected based on the size available. A total of 50 marketers/traders provided data used for analysis in this study. A total of 376 farmers provided information used for this study.

1.2.4. Data Limitations

Limitations of the data collected and used in this study arise from the fact that most of the respondents did not have written records of farming activities, hence data obtained were mainly from memory and subjective estimates. For instance, the standardized quantity of a farm output was estimated by converting the output measured in local units, such as bags, into standard weights and measures using appropriate conversion factors provided by agents of National Sesame Seed Association of Nigeria. In addition, no allowance was made for post-harvest crop losses during harvesting, threshing, transportation, storage, and so on, which might have caused under estimation of the total crop output. It was not possible to get actual area under sesame production in sesame producing areas selected. This reason made it difficult to estimate total output from the states. Hence, actual land area put to sesame production in Nigeria cannot be estimated. This reason made it practically impossible to achieve the first objective of this study with the data available.

Table 1: List of LGAs selected and sample size

States	LGAs	Sample size
Benue	Agatu	51
	Guma	34
	Katsina-Ala	8
Borno	Bama	79
Kogi	Ankpa	19
	Dekina	30
	Omala	40
Nasarawa	Obi	22
	Doma	44
Taraba	Takum	49

1.2.5. Method of Data Analysis

Frequency and descriptive statistics were used to characterise farm households involved in sesame production. Each farmer was assessed from an economic standpoint to determine the present gross margin of sesame producers. The gross margin estimate was the criterion used in evaluating economic profitability of sesame marketing. Sesame marketing in the study area was analysed using the structure-conduct-performance model. The structure of sesame markets was identified, including types of dealers, equipment, methods of transportation and storage facilities. Marketing costs were estimated for each identified channel. Then, the gross commercial margins (GCM) were evaluated for each channel.

1.3. RESULTS AND DISCUSSION

1.3.1. Socio-economic characteristics of respondents

Socioeconomic characteristics are key factors in agricultural production because of their influence on farmers' productivity and efficiency. Some of the characteristics considered in this section include; sex, age, education and household size:

- **Sex:** Eighty-nine percent of sample farmers are male. It shows that sesame seed production is dominated by male farmers. This is due to the fact that male farmers have more access to family land than their female counterpart because of the exclusive right of male children to inherit family land. This indicates that it would be easier to acquire land for sesame expansion in this setting, if farmers are motivated to increase production of sesame.
- **Age:** The average age of the respondents was 42 years (Table 2). About 21 percent were above 50 years while 57 percent were not more than forty years.
- **Education:** Education enables farmers to have access to information on new agricultural innovation which can be adopted to enhance their productivity. About one-third did not attend formal educational schools while 68 percent of the sample farmers have at least primary education (Table 3). This implies that there is potential for increased sesame production among the sample since a large proportion of the farmers are educated.

Table 2: Age distribution of sesame farmers in the study area (n=376)

Age interval (years)	Frequency	Percentage
≥20	2	1
21 – 30	94	25
31 – 40	117	31
41 – 50	84	22
51 – 60	49	13
61 – 70	24	6
>70	6	2

Source: Field survey of sesame farmers, 2011

Table 3: Distribution of educational status of sesame farmers in the study area

Educational Levels	Frequency	Percentage
No formal education	87	23
Arabic education	35	9
Primary	71	19
Secondary	103	27
Tertiary	80	21

Source: Field survey of sesame farmers, 2011

- **Household labour**: The more the number of workers available in a farmer's household the less the requirement for hired labour. Average number of household member participating in farm activity was 10 persons. This is an indication that the need for hired labour will be minimal among the sample sesame farmers thereby alleviating labour constraints.

- **Participation in On-farm trials:** Production technologies are usually introduced to farmers through On-farm trials. A farmer whose participation is frequent is expected to be more familiar and more knowledgeable about the use of improved agricultural innovations. Small proportion (16 percent) of the sample farmers have participated in OFAR trials. This may have negative influence on their perception and adoption of improved sesame production technologies. This situation may hinder effort to increase sesame production through low yield expected from poor farm management and low level of improved technologies.

1.3.2. Sesame Value Chain Analysis

Sesame is produced mainly for export in the study area. The key feature of sesame value chain in the study area included: Production, processing and Marketing. Figure 1 presents the flow chart diagram of sesame value chain in the study area.

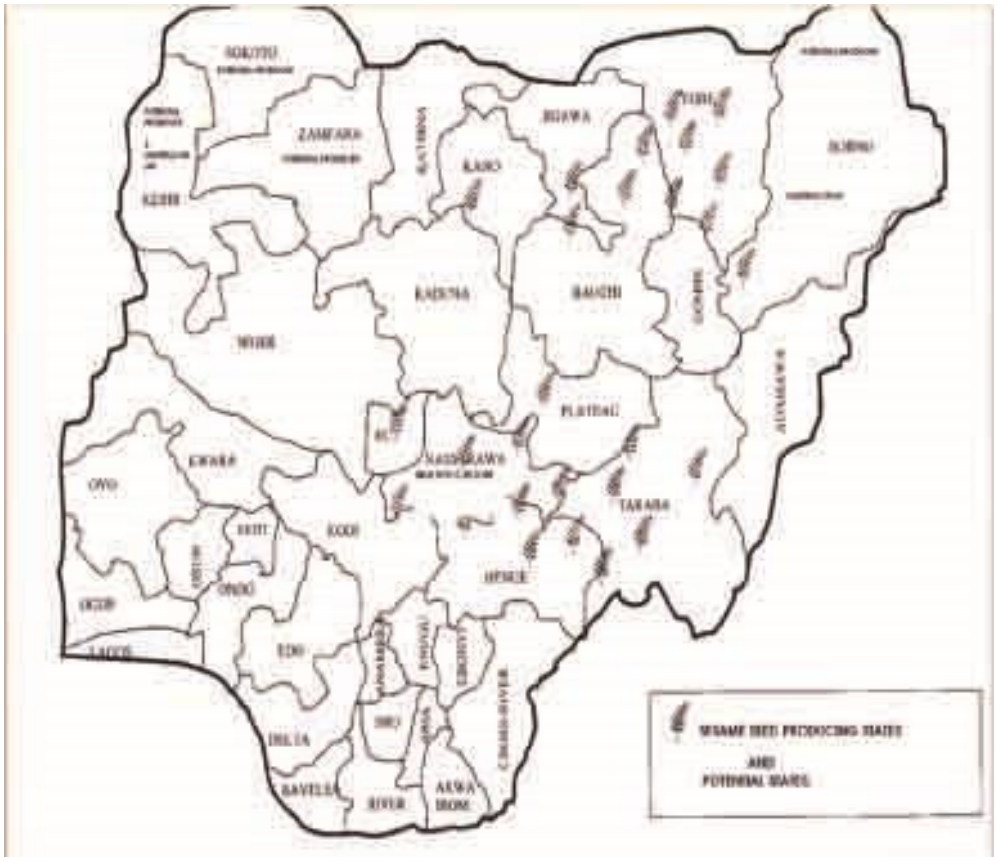
Figure 1: Flow chart of sesame value chain

Production	Farm inputs -Sesame cultivation - Harvesting
↓	
Processing	Stacking – threshing – winnowing - packaging
↓	
Marketing	Local collectors – retailers – wholesalers - exporters

1.3.3. Sesame production area and output

Figure 2 presents the states where Sesame is produced in Nigeria while the output of Sesame seeds produced is presented in Table 4. About 168,000 metric tons of sesame seeds are produced from the twelve states. Of the 168000mt produced in 2010, 138000 metric ton was exported while 30000 metric ton was consumed locally (NSSAN, 2011).

Figure 2: Map of Nigeria showing sesame producing states



1.3.4. Sesame production practices

Sample of sesame farmer in the study areas cultivates an average of 4.9 hectares of land. This accounts for 42 % of total cropping land area. Land for sesame production was mainly acquired through inheritance. Only 15 % acquired their land through other means such as: purchase (7 %), lease/rent (5%), gift (2%), others (1%). Farmers mainly prepared land for sesame through ridging (83 %), 15 % of the sampled farmers plant their sesame on flat soil while bedding accounts for 2 %.

The recommended type of land preparation for sesame production is flat soil. The low compliance to the recommended practice may account for low yield. Sesame is planted between April and September in the study area. A larger percentage (57 %) of the farmers planted in August. 16 % plants in April and July, 7 % plants in May, 4 % plants in June while 0.5 % plants in September. The main method of planting is by broadcasting (51 %). 39 % of the farmers adopt dibbling method, 5 % by drilling while 5 % of farmers adopt other methods. Sole cropping is adopted by 65 % of farmers while 35 % grow sesame seed in mixture with other crops. Most of the farmers do not recognise varieties by their names.

Varieties are known by their colour such as white, brown or red. 98 % of the sample farmers grow white coloured varieties. The duration of the varieties grown ranges from 3 to 4 months. Three months duration accounts for 62 %. The sources of seeds of the varieties grown by farmers were mainly from previous harvest (49 %) and local market (42 %). Others include: Agricultural Development Project (5%), Neighbouring farmer (3%) and Research Institute (1%).

Weeding is generally carried out by manual labour (7%) while 25 % of the farmers use herbicide. Fifty six % of the sesame farmers use fertilizers which are mainly inorganic. Twenty two % of them apply Urea, 16% used NPK, 2% applied SSP, 16% used combination of NPK/SSP/Urea while 2% applied organic fertilizer. Pesticides are applied by 31 % of the farmers. This is attributed to the low level of pest infestation in the area. The rating of the farmers with regards to field pest infestation revealed 63 % minor, 10 % major and 27 % moderate (Table 5).

The common pests of sesame in the study area are insects. Most of the farming activities are carried out manually. Harvesting is generally carried out between October and December. 77 % in October, 21 % in November while 2 % of the farmers harvested in December. Harvesting of sesame is done mainly by cutting (Plate 2) or by pulling. Harvested sesame is usually left on the field to dry by

stacking (Plates 3 & 4). 28 % dried harvested sesame by hanging (28 %). Drying is carried out for a period of two to three weeks. The mean yield of sesame is 434 kilogram per hectare. Considering the average farm size of 4.9 ha, average farmer harvests 2126 kg of sesame seed per season.

Tale 4. Output of Sesame seeds in some states in Nigeria

States	Quantity produced (mt)
Nasarawa	38000
Jigawa	32000
Benue	22000
Taraba	19000
Yobe	17000
Bauchi	9000
Borno	9000
Kano	9000
Plateau	9000
Kogi	7500
Kebbi	6000
Fedral Capital Territory	4000

Source: National Sesame Seed Association of Nigeria, 2010

Table 5: Farmers' ranking of Pest infestation (%)

Pest rating	Minor	Moderate	Major
Field	63	27	10
Storage	60	24	16

Source: Field survey, 2011

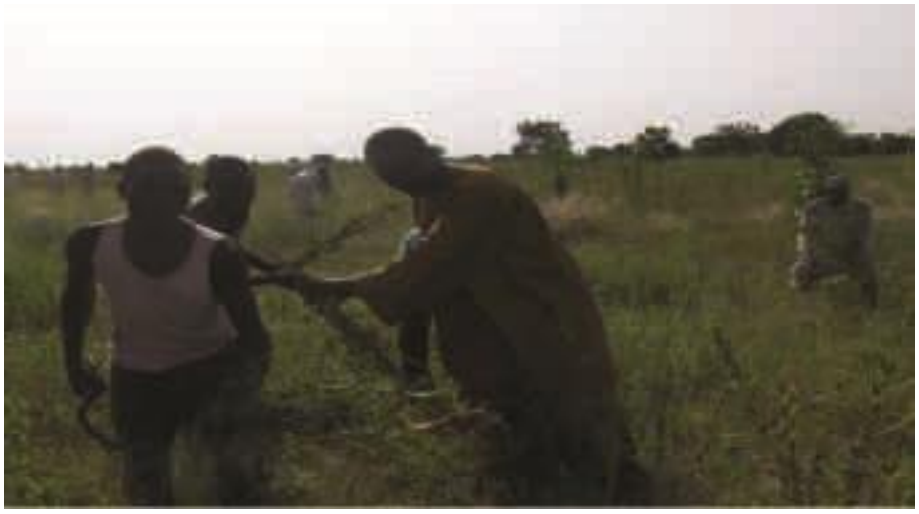


Plate 2: Manual harvesting of sesame

Plate 3: Harvested sesame left on the field to dry

Sesame processing

Post-harvest activities like threshing, winnowing and cleaning are manually carried out. The clean seeds are packed inside polythene bags and stored in the house before selling to the buyer. The period of storage ranges from one to twelve months. The average storage period is four months.

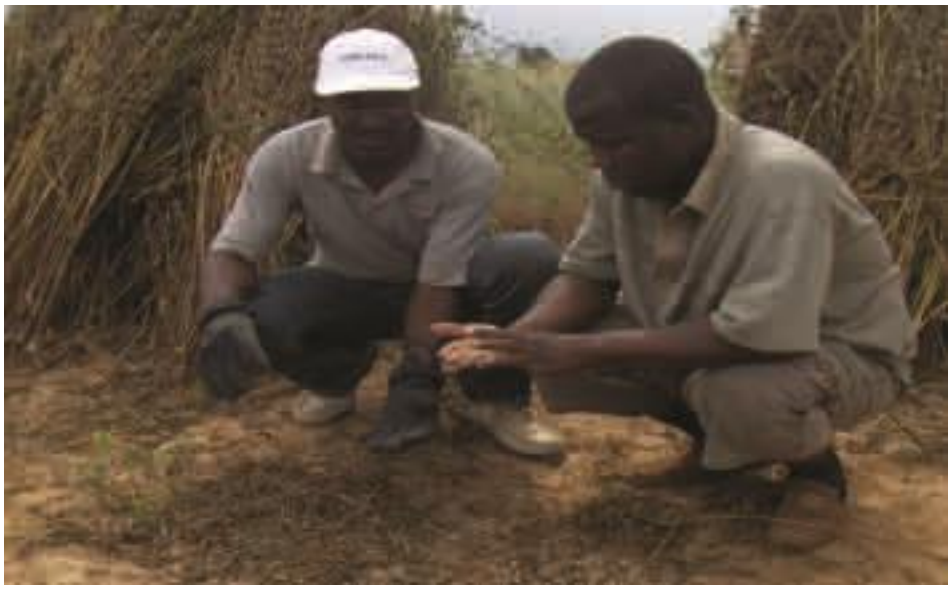


Plate 4: Inspection of threshed sesame seeds before cleaning

Plate 5: Sesame seed cleaning process

Plate 6: Packaging and transportation of sesame seeds to warehouse

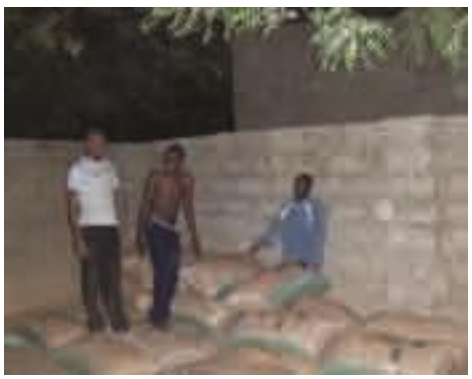



Plate 7: Loading of sesame seeds into port-bound vehicle for export

1.3.5. Cost and Return Analysis of Sesame Production

The main goal of most smallholder farmers is to maximise profit. An important question to examine is therefore the farm household production economics in terms of maximum attainable profit. Table 6 presents the enterprise budget for one hectare of sesame production.

The gross margin per hectare was N9, 190.00 and the net income was N1,189.25. Since the value of the two indicators were positive, sesame production can be considered profitable in the study area. The gross margin per variable costs, representing the returns per each invested Naira was 0.15. The net cash per variable cost is 0.02 revealing that the sesame farming is slightly cost-effective. To make sesame more profitable, there is need to either improve the yield or increase the price of sesame. This calls for farmers' adoption of modern farming technologies and efficient marketing environment.

Table 6: Enterprise budget for one hectare of sesame production

Budget items	Unit price(N)	Quantity	Cost Value (N)
Seeds	200	14kg	2,800.00
Fertilizer	70	200	14,000.00
Herbicide	1200	1 litre	1,200.00
Labour	500	84 man-days	42,000.00
Sacks	50	5	250.00
Total variable cost			60,250.00
Gross income	160	434kg	69440.00
Gross margin			9,190.00
Opportunity cost of capital (15% for six months)			4,518.75
Rent on land	2000	1ha	2,000.00
Depreciation cost			780.00
Total cost of production			67,548.75
Net income			1,189.25

Source: Estimated from survey data, 2011

1.3.6. Sesame supply and marketing patterns

Sesame supply and marketing at the farm level depends on the quantity targeted for home consumption, which in turn determines the surplus that can be sold. On average, the proportion of total production offer for sale is 0.81. This means that sesame is produced mainly for sale in the study area. Sesame is sold throughout the year, however, the majority of farm households (58%) sell their produce within the first three months after harvest. In general, sesame seed is sold at the local market place closest to farm gate. Means of transportation of sesame to the market were generally by motorcycle and vehicle. This implies that good road is necessary for sesame marketing. The delivery distances vary from few metres to 35 km, with an average of 16 km. Transport cost ranges from N500 to 1500 per ton from the market place to the storing depot. Sesame is directly sold either to consumers, or to others (collectors and resellers). The producers do not negotiate prices with middlemen in the market so that all bags of sesame seeds sold in the market on a given market day are sold at the same price. Prices of sesame seeds are set according to the season of the year. This

ranges from N14, 000 to N18, 000 per 100kg bag during harvesting and slack period respectively. The average price per season in the study area was N15,366.67.

Sesame marketing systems function in a framework of a free-market. There were no restrictions for any economic agent to operate in this sub-sector. Both men and women are found in sesame marketing systems. However, men (69%) are predominantly handling assemblage and transportation for exporters in some sesame depot.

1.3.7. Sesame marketing structure and conduct

Three structures of sesame marketing were identified during the survey. First, farmers supply directly to sellers. Secondly, sesame collectors procure the products from farmers and supply the sellers. However, there exists no formal organisation of collectors, and most of them operate only occasionally. The third structure is a combination of the two. Irrespective of the structure, sesame marketing is based on a certain confidence between the suppliers (farmer, collector or both) and the sellers (retailers). Table 7 presents the distribution of sesame buyers with respect to method of procurement. Most of the marketers procured sesame directly from the farmers.

Table 7: Distribution of sesame buyers with respect to method of procurement

Method of procurement	Frequency	Percentage
Direct	33	78
LPO	2	5
Agents	3	7
Middlemen	3	7
Others	1	3

Source: Survey 2011

Sesame is procured from various locations and assembled in the local market for further processing into exportable products. According to the categories of sesame suppliers, different locations of sesame supply were identified. The results indicate that most sesame sellers relied on suppliers located outside their locations. In Nasarawa, Doma is usually the collecting centre while Benue State has Makurdi as assembling centre. Sesame is processed and packaged in these centres. The final packaged products are transported to Lagos for export.

1.3.8. Economic performance of sesame marketing systems

The marketing cost structure and the gross margin analysis were analysed based on the annual operation per unit (tonnes). The results are presented in Table 8. Traders' average turn over was N20, 688,937.00 per season. Given the average sesame purchased of 788.4 tons per season, the variable cost per ton of sesame traded and gross commercial margin per ton were respectively N153,667.00 and N26,241.00. The return per naira invested in sesame marketing was 0.17, which can be regarded as slightly cost effective. Similarly, cost and return analysis of sesame seeds exportation is presented in Table 9. The result showed an export margin of N11,000/ton. The return to variable cost was 0.07, indicating slight cost effectiveness

Table 8: Sesame marketing costs structure and gross margin in the study area

Indicators	Mean
Quantity purchased (ton/season)	788.4
Price/ton (N/season)	153,667
Purchase cost (N/season)	121,151,063
Transport cost (N/ season)	788,400
Sales value (N/season)	141,840,000
Turn over (N/season)	20,688,937
Gross margin (N/ton)	26,242

Source: Estimated from survey data

Table 9: Sesame export costs structure and margin in the study area

Budget items	**Unit**	**Total cost**
Sesame seed	1 ton	150,000
Processing	1 ton	3,000
Packaging	100 bags	1,000
transportation	1 ton	7,500
tax/other charges	1 ton	1,200
Forwarding	1 ton	3,000
Inspection	1 ton	1,000
Documentation	1 ton	1,500
Port charges/levy	1 ton	1,500
Total	1 ton	169,000
Fob price	1 ton	180,000
Export margin	1 ton	11,000

Source: Survey, 2011

1.3.9. Comparison of profitability along the value chain

Return to naira invested of stakeholders along the value chain is presented in Table 10. Based on one ton of sesame, local marketers were better off than farmers, while exporters were the least remunerated. Considering the quantity of sesame a farmer can produce per season (2.1tons), with what a marketer (788 ton) purchased and sold per season, a marketer will break even before the farmer; hence sesame marketing is more financially viable than farming enterprise. The implication is that sesame marketing activities will be more attractive to investors. Therefore, there is need to increase productivity of sesame farmers in order to make it more financially viable.

Table 10: Return on investment along the value chain

Budget items	Farmer	Retailers	Exporters
Variable Costs (N/ton)	138,825*	153,667	169,000
Gross margin (N/ton)	21,175*	26,242	11,000
Return/naira invested	0.15	0.17	0.07

*60,250/ha = 138,825/ton and 9,190/ha=21175/ton since 434 kg is produced per hectare

Source: Estimated from survey data

1.3.10. Identification of hazard control points in the sesame value chain

The general practice of farmers is to leave the harvested sesame on the field for some time to dry before threshing. There is need to control too much contact with moisture at this stage to avoid fungi growth. Effort should also be made during threshing to avoid seed contact with the ground. In storage the seed should be packed in a well-ventilated area.

1.3.11. Major constraints to sesame production and marketing

Some challenges in sesame seed value chains are presented in Table 11. Major constraints facing sesame farmers were low yield, low profit, inadequate capital, high cost of transportation, low exposure to improved production technologies, poor roads, inadequate training, high cost of fertilizer, inadequate financial incentives and lack of modern processing facilities. Marketers also face the following constraints: lack of financial incentives, high cost of transportation, poor roads, multiple taxation, lack of modern processing facilities, inadequate capital, inadequate training, insufficient access to market information and poor pricing of produce.

Table 11: Major constraints of respondents

Constraints	Farmers N=376		Marketers N=50	
	Frequency	*Percentage	Frequency	*Percentage
Inadequate capital	271	72	33	66
Lack of financial incentives	256	68	38	76
Low yield	338	90	-	-
Low return	282	75	28	56
High cost of transportation	263	70	38	76
Poor pricing	210	56	30	60
Lack of technical knowledge	263	70	25	50
Inadequate training	263	70	33	66
Fertilizer expensive/short supply	263	70	-	-
Low soil fertility	210	56	-	-
Poor roads	263	70	37	74
No access to timely mechanization	263	70	-	-
Insufficient access to information	241	64	31	62
Multiple taxation	-	-	35	70
Lack of processing facilities	242	65	35	70

Source: Survey 2011 * multiple response

1.3. CONCLUSION AND RECOMMENDATIONS

Sesame is mainly produced for export in Nigeria but the level of farmers' productivity is very low. The potential yield of improved sesame varieties without good management practices is about 400kg/ha while same varieties produce up to 1000kg/ha when grown under improved management practices. The market structure for sesame seeds cannot be said to be well organised. Sesame is utilised locally to prepare soup and snack. Also industrial extraction of sesame oil is not common. Consequently, reliable information on sesame seed production and consumption is difficult to get. At the moment sesame seed is transported in bulk vessels or trailers meant for other commodities. This causes adulteration and or contamination of the sesame seeds.

The following recommendations will create greater transparency which will improve and enhance the sesame seed value chain

Provision of improved varieties of sesame with wide adaptation to various growing conditions.

Farm inputs should be made available to farmers at the right time and at affordable prices.

In order to encourage and promote sesame seed production there should be fabrication, perfection, testing and introduction of affordable efficient easy to operate adaptable farm machineries, for small/medium scale farmers. In addition adaptable, household/cottage level processing and utilization technologies should be made available to farmers.

There is need to enlighten farmers on the benefits of organic farming.

Formation of farmers cooperative should be encouraged.

It is also important to provide the necessary infrastructures to ease transportation. The provision of a guaranteed minimum price will also create transparency in sesame seed value chain since at the moment farmers experience low pricing for their produce.

A well-managed contract farming can be used as an effective way to coordinate and promote boosting the production of good quality sesame seed for industrial use and export since farmers will benefit from new technologies.

Training on improved method of production and marketing is necessary. There is need for regular training of farmers in pest and disease control methods that can be adopted by farmers and also give economic crop yield.

Similarly awareness/enlightment should be regularly created among farmers on post harvest handling, transportation and storage to reduce the level of crop loss and contamination to the barest minimum.

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ANNEX 1: QUESTIONNAIRE

DIAGN0STIC SURVEY/CHARACTERIZATION OF THE SESAME SEED

PERSONAL DATA

1. NAME: _____

2. VILLAGE: _____

3. LGA: _____

4. STATE: _____

5. SEX: MALE/FEMALE _____

6. AGE (IN YEARS): _____

7. EDUCATION:

A) NO FORMAL EDUCATION

B) QUORANIC

C) PRIMARY EDUCATION

D) WASC EQUIVALENT

E) ABOVE SECONDARY EDUCATION

8. TOTAL NUMBER OF HOUSEHOLD MEMBERS PARTICIPATING IN FARM WORK

FIELD DATA:

9. SIZE OF SESAME SEED FARM IN HECTARES……..

10. WHAT IS THE METHOD OF LAND ACQUISITION?

A) PURCHASE

B) INHERITANCE

C) GIFT

D) LEASE/RENT

E) BORROW

F) OTHERS (SPECIFY)

11. TYPE OF LAND PREPARATION:

A) RIDGE

B) FLAT

C) ZERO TILLAGE

F) BEDDING

12. WHAT IS TOTAL FARM CULTIVATED BY THE FARMER IN THE SEASON IN HECTARE(S)

13. DOES THE FARMER GROW HIS SESAME IN MIXTURE WITH OTHER CROPS? YES/NO

14. IF YES, LIST THE COMMON MIXTURES AND YIELD OBTAINED:

A) _____

B) _____

C) _____

D) _____

E) _____

15. METHOD OF PLANTING:

A) BROADCASTING

B) DRILLING

C) DIBBLING

D) OTHERS

16. WHAT ARE THE MAIN VARIETIES OF SESAME SEED CULTIVATED BY THE FARMER?

S/NO	VARIETIES	DURATION	COLOUR	YIELD(kg/ha	Price/kg
A					
B					
C					
D					
E					
F					
G					

17. COMMON PLANTING DATES IN SEASON:

A) APRIL

B) MAY

C) JUNE

D) JULY

E) AUGUST

F) SEPTEMBER

18. SOURCES OF SESAME SEED:

A) LAST SEASON HARVEST

B) NEIGHBOUR

C) LOCAL MARKET

D) ADP

E) CONTACT FARMERS

F) RESEARCH INSTITUTES

19. TIME OF HARVEST:

A) _____

B) _____

C) _____

20. MODE OF HARVEST:

A) PULLING

B) CUTTING

21. METHOD OF DRYING:

A) HANGING

B) STACKING

22. METHOD OF THRESHING:

A) MANUAL

B) MECHANICAL

23. METHOD OF WINNOWING:

A) MANUAL

B) MECHANICAL

24. METHOD OF CLEANING:

A) MANUAL

B) MECHANICAL

25. TYPES OF PACKAGE:

A) _____

B) _____

C) _____

26. TYPES OF STORAGE:

A) _____

B) _____

C) _____

D) _____

27. (A) STORAGE PERIOD. (MONTH AFTER HARVEST)

(B) COST OF STORAGE (IF ANY)---------- ₦/PER MONTH.

28. STORABILITY OF VARIETIES:

S/NO.	VARIETY	MAX PERIOD OF STORAGE
I		
II		
III		
IV		
V		
VI		
VII		

29. FACTORS LOWERING STORABILITY ACCORDING TO THEIR IMPORTANCE:

A) _____

B) _____

C) _____

D) _____

F) _____

30. SPECIFY INPUTS USED AND THE QUANTITY:

A) FERTILIZER USED AND QUANTITY APPLIED.

NPK	UREA	SSP	ORGANIC MANURE	OTHERS

B) SIZE OF LAND_____

C) LABOUR INPUTS

FARMING ACTIVITIES	NO OF MEN USED	NO OF HOURS USED	WAGE RATE PER DAY
LAND PREPARATION			
PLANTING			
WEEDING 1ST			
WEEDING 2ND			
WEEDING 3RD			
HERBICIDE APPLICATION			
FERTILIZER APPLICATION			
PESTICIDE APPLICATION			
HARVESTING			
PROCESSING			
BAGGING			

31. OTHER INPUTS:

INPUT USED	UNIT OF MEASURE	QUANTITY	PRICE/UNIT
HERBICIDE			
INSECTICIDE			

32. SESAME SEED PESTS:

A) FIELD AND STORAGE PEST.

S/NO	PESTS	FIELD	STORAGE	CONTROL METHOD BY FARMERS
I				
II				
III				
IV				
V				
VI				
VII				

34. FARMERS RATING OF PEST OF SESAME SEED IN STORAGE IN THIS AREA:

A) MINOR

B) MAJOR

C) MODERATE

35. FARMERS RATING OF FIELD PESTS OF SESAME SEED IN THIS AREA:

A) MINOR

B) MAJOR

C) MODERATE

ADOPTION OF TECHNOLOGY:

36. HAS THE FARMER PARTICIPATED IN ANY ON-FARM TRIAL ON IMPROVED SESAME SEED VARIETIES? YES/NO

37. IF YES, WHAT IS THE PERCEPTION OF THE FARMER WITH REGARDS TO THE RELATIVE PERFORMANCE OF THE IMPROVED VARIETIES IN THE PREVIOUS SEASON?

A) YIELD WAS HIGHER THAN OBTAINED FROM THE LOCAL VARIETIES.

B) THERE WAS NO DIFFERENCE IN THE YIELD

C) YIELD WAS LOWER WITH IMPROVED VARIETES.

3**8. WILL THE FARMER ADOPT THE IMPROVED VARIETIES NEXT FARMING SEASON? YES/NO**

REASONS:

_____

_____

_____

_____

_____

MARKET SURVEY

1. AREA OF PROCUREMENT:

A) TARABA ☐

B) BENUE ☐

C) KOGI ☐

D) BORNO ☐

E) NARARAWA ☐

F) KEBBI ☐

2. PROCUREMENT METHOD:

A) DIRECT PURCHASE ☐

B) L.P.O ☐

C) AGENTS ☐

D) MIDDLE MEN ☐

E) ANY OTHER.

3. VOLUME OF PROCUREMENT PER SEASON IN TONNES :

_____IN TONNES

4. VOLUME OF EXPORT PER SEASON IN TONNES:

_____ IN TONNES.

5. PROCESSING METHOD:

A) MANUAL ☐

B) MACHINE ☐

6. METHOD OF STORAGE:

A)_____

B) _____

C) _____

D) _____

E) _____

7. MODE OF TRANSPORTATION:

A) ON FOOT

B) ON MOTORCYCLE/BICYCLE

C) MOTOR VEHICLE

8. WHAT TYPE OF PESTICIDE DO YOU APPLY FOR THE FOLLOWING PESTS?

I RATS _____

II INSECTS _____

III FUNGI _____

IV BIRDS _____

9. HAVE YOU BEEN TRAINED ON PESTICIDE APPLICATION TO FOOD ITEMS? YES/NO

IF YES, WHICH ORGANIZATION

10. DO YOUKNOW HOW TO APPLY CHEMICALS/FUMIGANT? YES/NO

11. IS THERE ANY STANDARD PROCESSING CENTRE FOR SESAME SEED IN THIS LOCALITY? YES/NO

IF YES, NAME THE PLACE(S)

_____

_____

_____

_____

_____

12. HOW DO YOU HANDLE SESAME SEED CAKE AFTER PROCESSING?

I. THROW IT AWAY AS WASTE

II. USE AS ANIMAL FEED

III. USE AS FOOD CONDIMENTS

13. IS YOUR EFFORT ON SESAME SEED HANDLING AND PROCESSING JUSTIFIABLE IN RESPECT TO THE ECONOMIC RETURNS DERIVED FROM IT? YES/NO.

IF NO, WHAT ARE THE PROBLEMS ENCOUNTERED?

_____

_____

_____

_____

_____