

Factors Associated with Shea Butter Processing in Kwara State, Nigeria

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Abstract - The need to improve the production of shea butter as a means of sustainable livelihood and monetary income for rural dwellers in the nation necessitated this study. The factors associated with shea butter processing were assessed in this study. Interview schedule was employed to elicit information from the respondents. Structured interview schedule was administered to 160 randomly sampled shea butter processors in Kwara State. Data obtained were subjected to descriptive and inferential statistics. Results of the study revealed that majority of the processors were females, elderly, married with little or no formal education. They had large household size with shea butter processing being their primary occupation. Processing techniques adopted by respondents were rudimentary, laborious and time consuming. Processors identified rainfall as a very important climatic factor, knowledge of improved technologies as a very important factor, access to credit facilities as a germane economic factor, availability of water as a very important physical factor associated with Shea butter processing. Insufficient water, bad road networks and lack of credit were very severe constraint among the respondents. There is thus the need by the state government to provide more basic infrastructural facilities like water, electricity, rural feeder roads to enhance the capacity of Shea butter processors. Association of respondents with cooperative societies should be encouraged through extension education to boost their productivity in meeting up with the demands for domestic consumption, export and family bills.

Keywords – Constraints, Shea Butter, Shea Processing Factors.

I. INTRODUCTION

The shea-tree (*Vitellaria paradoxa*) is an important specie of the park land agro forestry system of the Sudan-Africa savanna. Shea tree is indigenous to the Guinea and Sudan savanna zone from Senegal to Sudan, and to western Ethiopia and Uganda, in a belt 500–700km wide. It is found in the interior, separated from the Gulf of Guinea by forest; only in Ghana and Nigeria does it occur within 50km from the coast (11). The abundance of the Shea tree in Nigeria exists in and thrives almost exclusively in the central and Northern parts of the country [6]. Shea nut and shea butter are international commodities today and they constitute primary sources of monetary income for rural women across these regions, contributing significantly to the Gross Domestic Product of the countries where it is present (3). About ten percent of this production was exported, mainly to Europe and Japan, whereas 545,000 tons were processed locally, into an estimated 131,000 tons of shea butter (4). As a natural resource controlled by mostly women, the shea butter tree

vitellaria paradoxa supports the nutritional and economic health of rural families and sustains this indigenous plant biodiversity. This wild and slow growing savannah tree provides food (nutritious fruit as well as food oil), and revenues from the sale of its annual bounty help rural households to feed themselves, to invest in livestock and other income-generating forms of wealth, to meet cash requirements including shelter, clothing, healthcare, taxes, school fees, school uniforms and school books. It stems climatic risks in basically rain fed agricultural production practice of rural farm families, where crops fail to drought and other climatic variation factors, offering huge avenue for food and income needs of rural farm families. It aids in the diversification of the rural economy of the nation and prevent the degradation of soils. Shea butter is considered to be one of the few resources available in rural areas of West African countries, where many food security problems persist. Shea butter has great potential of providing the much needed source of dietary fat for poor households.

Shea butter processing in Nigeria is mostly done traditionally by women in the rural areas, the procedure is quite tedious and time consuming, from collection of the shea fruits to the production of the end products. A variety of methods are used traditionally to remove the husks. These include trampling, pounding using a mortar and pestle, and cracking between two stones. In removing the oil from the kernels, it is estimated that the production of 1kg of Shea butter takes one person 20-30 hours and that 8.5-10.0kg of wood fuel is needed to produce it [10] and [6]. This means that energy input is quite high.

No estimates exist of the overall balance between cost of input energy and the economic profit from the sales of shea butter. Kwara state is blessed with shea tree which is an economic tree that provides a veritable treasure throve of benefits for the people of this region and financial returns to processors. Shea butter is popularly processed in this state with processing being predominantly done by women. The traditional extraction technique of shea butter is time consuming, physically exhausting and requires large quantities of fuel wood and water; resources that are often scarce in the regions where the butter is produced [7]. In general, it is also inefficient in terms of the amount of fat extracted. The productivity of traditional processing methods is quite low, and the product quality is highly variable, depending upon the skills and attention of the processor. Regrettably, its consumption, production and commercialisation have not been given adequate recognition and support, but in recent years, shea tree has gained importance as an economic tree because of the

heavy demand for its butter both locally and internationally [7]. The Shea butter market is expanding considerably following the European Union (EU) decision in 2000 to allow up to 5% of non-cocoa vegetable fat in chocolate manufacturing, hence, shea butter has potential of evolving into a viable export industry since industries in developed countries are expressing their interest in importing shea butter [5]. In spite of the huge potential that Nigeria possesses in terms of shea tree resource, production of shea butter still remains far below demand, both in the local and international markets as the quality of the butter falls below local satisfaction and international standard. Meanwhile, production still remains very low, as the traditional processing technique is still predominantly used with minimum mechanical input, time consuming, physically exhausting and requires large quantities of fuel wood and water resources are often scarce in the locations where the butter is processed exposing the processors to untold hardship and exposure to health hazards. It is therefore important to assess the ingenuity of the shea butter processors and conditions meted with, in facilitation of shea butter to local food chain and national food security. Hence this study sought to provide answers the following research questions;

- 1) What are the personal characteristics of shea butter processors?
- 2) Are there constraints associated with shea butter processing in the study areas?
- 3) What is the quantity of shea butter processed in the study area?
- 4) What are the factors associated with shea butter processing in the study area?

Hypotheses of the Study

H₀₁: There is no significant relationship between the level of involvement in shea butter processing stages and the quantity of shea butter processed

H₀₂: There is no significant relationship between constraints being faced by the processors and the quantity of Shea butter processed

H₀₃: There is no significant relationship between factors associated with shea butter processing and the quantity of Shea butter processed

II. METHODOLOGY

The study was carried out in Kwara state, which is one of the six states in north central Nigeria. The state lies in the north central zone and covers an area of 74256 sqkm or of the total area of Nigeria. Kwara State is bounded in the north by Niger State, in the south by Oyo, Osun and Ekiti States, in the east by Kogi State and in the west by Benin Republic. Because of its unique geographical position, the State is referred to as the "gateway" between the north and the south of the country. The state is divided into sixteen (13) local government areas. Kwara state was selected for the study because, in Nigeria the Shea tree occurs and thrives well within the Guinea and Savannah areas as well as the lower Sahel regions of the country with a rainfall requirement of 600 – 1,500mm annually. The state lies in the guinea savannah belts with rainfall

ranges from 800 – 1500mm. The wet season starts from April to October with peak rains in May/ June and September/October. November to February is virtually without rainfall, mean temperatures ranges from 20⁰c to 22⁰c. Humidity ranges from 50% in dry season and up to 85% in the wet season. Prevailing winds are south westerly, during the rainy season and North Easternly during the dry season. Agriculture is the main stay of the economy and the principal cash crops are: cotton, cocoa, coffee, kola nut, sheanut, tobacco, beniseed and palm produce. The prevailing Agricultural system is a combination of bush fallow and mixed cropping with emphasis on subsistent farming. Kwara State is an heterogeneous state attracting different ethnic groups including the Yoruba's, Nupes, Barubas, Fulanis and Hausas.

The major ethnic group in the state are the Yorubas and their language is widely spoken across the state. Farming is the predominant occupation of residents of Kwara state. While some engage in craft activities such as cloth weaving, blacksmithing, bricklaying, carpentry, welding, etc. Fishing is also prominent along the lower River Niger Basin

III. SAMPLING PROCEDURE AND ANALYTICAL TECHNIQUE

Kwara state has sixteen (16) Local Government Areas. Agricultural Development project (ADP) classified the 16 LGAs into four (4) Agricultural zones, 23 blocks and 184 cells (KWADP, 2005). A purposive sampling technique was used to select two Agricultural zones (A & C). Zone A, which comprises of two Local Government areas (Kaima and Baruteen LGAs) while Zone C comprises of 5 Local Government areas (Ilorin West, East, South, Moro, and Asa LGAs). Because of large number of Shea butter processors in the zone. Thirty percent (30%) of the ward in each of the selected LGAs in the two zones were selected. A snowball technique was used to generate a list of 200 Shea butter processors in the selected LGAs after which simple random sampling technique was used to select one hundred and sixty (160) respondents which formed the sample size.

The quantitative data for this study were obtained through the use of structured questionnaires and interview schedule. The questionnaires had both open ended and close ended questions concerning the objectives and hypothesis of the study. The data collected were analysed using both descriptive (frequency counts, percentages, and means) and inferential statistics (Chi-square and t-test). The independent variables for the study include selected personal characteristics, information sources, processing techniques, level of involvement in the processing stages, processing factors, processing techniques and processing constraints. While the dependent variable is the quantity of Shea butter processed

IV. RESULTS AND DISCUSSION

Table 1.0: Demographic characteristics of Shea butter processors (N=160)

Variables	Categories	Frequency	Percentage
Age	30-39	17	10.7
	40-49	68	42.5
	50-59	73	45.6
	60years and above	2	1.2
Sex	Male	6	3.8
	Female	154	96.2
Marital status	Single	2	1.2
	Married	124	77.5
	Divorced	9	5.6
	Widowed	22	13.8
	Separated	3	1.9
Educational status	No formal	75	46.9
	Quranic	57	35.6
	Adult	11	6.9
	Primary	17	10.6
Household size	1-4	21	18.1
	5-8	91	56.9
	More than 8	40	25.0
Other income generating activities	Yes	98	61.6
	No	62	38.4
	Hairdressig	4	2.5
	Tailoring	6	3.8
	Garri processing	25	15.6
	Fish processing	3	1.9
	Trading in other items	58	36.3
	Others	32	20.2
	Membership of Association	Yes	158
No		2	1.3
Cooperatives	Ordinary	159	99.4
	Committee	1	0.6
Religious group	Ordinary	156	97.5
	Committee	3	1.9
	Executive	1	0.6
Egbeolori community group	Ordinary	144	90
	Committee	6	3.8
	Executive	10	6.3

Field survey 2012

A. Personal Characteristics of Shea Butter Processors

The age (in years) of respondents are grouped to reflect the level of individual responsibility, expected physical strength for processing shea butter. The age distribution as illustrated above shows that 45.6% of the respondents are between the age ranges of 50-59 years, a less proportion 42.5% were in the age range of 40-49 year while 10.7% of the respondents were in the age range of 30-39 years while only 1.2% of the respondents are 60years above. This corroborates the findings of [2] who found that in Nigeria at least 75% of the actors are elderly women, as compared to 25% of men but this ratio varies according to different regions. A larger proportion of the respondents were females (96.2%), while 3.8% of the respondents were males. This result agrees with the findings of [7] that across the African shea zone, women are the traditional custodians of the shea resource, with responsibility and control over all the stages of processing from collection of the fruit to transformation and marketing of shea butter.

Majority 77.5% of the shea butter processors were married, 13.8% were widowed, 5.6% are divorced, and

1.2% were single this suggests the relevance of shea butter processing to household welfare. Also majority of the respondents were married, as the major source of labour processing comes from the family and self, which accounts for about 73.8% of labour used in the processing stages.

The educational status of the respondents indicated that 45.6% of the respondents had no formal education, 35.0% of the respondents had Quranic education, 10.0% had primary education, while only a few (2.5%) had secondary school education, the larger % of the respondents with no formal education agrees with the finding of [1] that two third of the one billion of illiterate persons in the world are women and girls. It was also revealed that 63.1% of the respondents had other income generating activities such as Hairdressing (2.5%), Tailoring (3.8%) Garri processing (15.6%), Fish processing (1.9%), Trading in other items (36.6%), while (38.8%) of the respondents do not have other income generating activities. Membership of associations, (98.8%) of the respondents belongs to associations, such as the religious group where about 97.5% were ordinary members, 1.9% were committee members and 0.6% were executive members. In terms of membership of Cooperative societies, about 99.4% of the processors were ordinary members, and 0.6% were committee members. For membership of shea butter processing association (*egbeolori*) about 90% of the respondents were ordinary members, 3.8% were committee members and only 6.3% were executive members. A large proportion of the respondents belonged to this association which represents the processors and their shea butter processing enterprise.

Table 2: Distribution of Respondent Based on preferred Source of Information on Shea Butter Processing

S/N	Source of Information	Frequency	Percentage (%)	Rank
1	Extension Agents	87	54.4	3 rd
2	Television	23	14.4	4 th
3	Women association	150	93.8	1 st
4	Radio	135	84.4	2 nd
5	Others	18	11.3	5 th

Source: Field survey data, 2012.

* Multiple responses were allowed

The study revealed that (93.8%) of the respondents obtained information on shea butter processing from the women association, (84.4%) from radio, (54.4%) from extension agent while only 14.4% of the respondents sourced information on shea butter processing from television and 11.3% of the respondents obtain information from other sources. This could be attributed to the high level of illiteracy among the respondents, as most of the respondents had no formal education, coupled with fact that most of the rural areas lack basic infrastructures such as electricity. This study, therefore reveals that only few extension agents have been reaching the shea butter processors this findings also of [4] that, many rural processors are not aware of the critical

technical issues which affect product quality, extension training remains a long-term requirement across the Shea zone

Table 2.1: Level of Involvement in the Processing Stages of Shea butter

Level of involvement in processing stages	Actively involved (%)	Moderately involved (%)	Not involved (%)
Shea nut collection	3.8	23.8	72.5
Washing of collected nuts	14.4	70.6	15.0
Drying of washed nuts	12.5	75.6	11.9
Nut selection	16.3	73.8	10.0
Nut cracking and crushing	11.9	60.6	27.5
Roasting of crushed nuts	39.4	55.6	5.0
Milling of roasted nuts	16.3	37.5	46.3
Cold water mixing	96.9	1.9	1.3
Hot water mixing	98.8	0.6	0.6
Cold water separation	98.8	0.6	0.6
Boiling	97.5	1.9	0.6
Filtrations /solidification	98.8	0.6	0.6
Packaging	98.8	0.6	0.6

Field Survey 2012

The level of involvement of respondents illustrated above showed that processors are actively involved in cold water mixing (96.9%), hot water mixing/kneading (98.8.2%), cold water separation (98.8%), boiling 97.5% filtration & Solidification (98.8%) and packaging (98.8%), A larger percentage of the processors were actively involved in the latter stages of processing as this requires a lot of skill and expertise in determining the quantity and temperature of water, temperature at which the paste is boiled, also in the filtration and packaging of the butter in

a bid to reduce the impurities in the butter. This corroborates the findings of [9] the quality of Shea butter is highly variable, depending on the care and skill of the processor.

while 75.6% were moderately involved in the washing of the nuts, 73.8% in nut selection, 70.6% washing of nuts, 60.6% in nut cracking and crushing, 55.6% in roasting of crushed nuts while only 37.5% in milling of roasted nuts . the study revealed a lesser percentage of the respondents were moderately involved in these activities as children were involved in these stages and most processors supervise these activities, based on the findings in Table 4.1 that a large number of the respondents were elderly, activities that required high energy are assigned to children who are still youthful and energetic. The study further revealed that 72.5% of the respondents were not involved in shea nut collection, 46.3% in the milling of roasted nuts. Most of the respondents are not involved in shea nut collection as the tree grows in the wild, that are very far from the villages, as well as the fact that most of the processors are quite elderly and cannot walk such long distances, also in the course of collection of nuts the processors are exposed to a number of dangers such as snake bites, scorpion bites etc as this in line with the findings of [12] who found that Pickers wake early in the morning and trek up to 15km, then carry the loads back in head pans of 20-25kg (sometimes over 40kg). Hazards include scorpions and snakes bites, especially when nut collection is beyond cultivated areas.

Table 3.0: Distribution of Respondents Based on Factors Associated With Shea Butter Processing

Factors associated with Shea butter processing	Very Important (%)	Important (%)	Less Important (%)	Not important (%)
Climatic factors				
Rainfall	91.9	5.6	1.9	0.6
Sunshine	10.6	81.9	5.0	2.5
Relative Humidity	74.4	20.0	5.6	-
Humidity	1.9	8.8	52.5	36.9
Strong winds	53.1	32.5	11.9	2.5
Technological factors				
Expertise	80.6	55.0	8.1	-
Knowledge and availability of improved technologies	21.9	32.5	21.9	1.3
Improved storage facilities	25.0	65.6	8.8	0.6
Economic factors				
Price of butter	80.6	15.0	4.4	-
Demand for butter	55.6	40.6	2.5	1.3
Income	85.0	10.6	3.8	0.6
Credit facilities	83.1	10.6	5.6	0.6
Cost of inputs	28.1	41.3	28.1	2.5
Competition for Nuts	66.3	21.9	9.4	2.5
Availability of market	23.1	53.1	22.5	1.3
Physical factors				
Accessibility to markets	70.6	22.5	6.3	0.6
Transport facilities	91.9	5.0	3.1	-
Water Availability of fuel wood.	93.8	3.1	2.5	0.6

Source: Field survey data, 2012.

indicated above, majority of the respondents (91.9%) identified availability of water as very important physical factor, as water is a very important input in processing of shea butter, as virtually all the stages requires the use of water with just a few stages not requiring the use of water. The core processing stages (cold water mixing, hot water mixing, cold water separation, boiling, and filtrations) cannot be carried out without the water. while (80.6%) of respondents identified knowledge and availability of improved technologies as a very important technological factor, as the availability of improved technologies will eliminate the drudgeries of processing, as the traditional processing methods are quite labour intensive, it is estimated that the production of 1kg of Shea butter takes one person 20-30 hours and that 8.5-10.0kg of wood fuel is needed to produce it [6]. Availability of technologies will also aid in addressing issues around the quality of butter processed. Procurements of modern processing equipments e.g. nutcrackers, milling machines, mixers etc are also capital intensive as most of the processors cannot

afford these equipments. Also (85.0%) of the respondents identified access to credit facilities as the most important economic factor associated with shea butter processing as most of the processors do not have access to credit facilities, to hire labour, buy nuts as most of the processors do not collect nuts. A proportion of the respondents (36.9%) stated that strong winds was not an important climatic factor associated with shea butter processing as they can still process with or without strong winds though strong winds affect the trees as the nuts are dropped before they are matured.

Constraints Associated with Shea Butter Processing

Constraints are limitations or restrictions militating against the shea processing enterprise, from the field survey, summarized below are constraint identified by shea processors in the study area and the degree of severity. The respondents identified issues that greatly affect their processing of shea butter.

Table 4.0: Identified Constraints and degree of severity as stated by respondents

Constraints Associated With Shea Butter Processing	Very severe (%)	Severe (%)	Not Severe (%)	Not a constraint (%)
Inadequate Transportation Facilities.	30	50	20	-
Lack of storage facilities.	28.1	61.3	9.4	1.3
Bad road Networks.	80.0	28.1	6.9	-
Uncoordinated marketing System for the products.	6.9	40.6	23.8	28.8
High cost of modern Processing equipments.	71.9	22.5	3.8	1.9
Inadequate extension services.	26.9	49.4	10.0	13.8
Lack of credit facilities	91.9	6.9	1.3	-
Lack of water	95.6	4.4		-

Source: Field survey data, 2012.

The data in table above revealed that major constraints identified by respondents were, inadequate transportation facilities, high cost of modern processing equipments, inadequate extension services, lack of water, lack of credit facilities and uncoordinated marketing systems for products. 95.6% of the respondents identified lack of water as a very severe constraint, as quite a number of processing stages involves the use of water, but most of the processors complained that they had no water, they have to trek distances to get water for their processing activities. These findings corroborate the findings of [6], who opined that the traditional extraction technique of Shea butter is time consuming, physically exhausting and requires large quantities of fuel wood and water; resources that are often scarce in the regions where the butter is produced 80.0% of the respondents also identified bad road network as a very severe constraint, the processors have to walk long distances to markets, to buy nuts, as most of their roads are in a very bad state, this finding is in line with [8] who found that Transportation issues are widespread with high costs, limited reliability, poor roads and corrupt customs procedures in existence for anyone wanting to move shea kernel butter between countries or out of continent. While 61.3% stated that lack of storage facilities was severe and 49.4% of the respondents identified inadequate extension services as been severe.

Quantity of Shea Butter Processed

Table 5.0: Distribution of respondents based on the quantity of Shea butter processed annually.

Variable	Category	frequency	%
Quantity	Below 500kg	2	1.3
	501-1000kg	82	51.3
	1001-1500kg	42	26.3
	1501-2000kg	33	20.6
	2001-2500kg	1	0.6

Source: Field survey 2012

This table illustrates that half (51.3%) of the respondents were processing between 501-1000kg of shea butter per season, A process level below the mean value of 1345kg per season. A small percentage(1.3%) of the respondents processed below 500kg, and 0.6% processed above 2000kg per season, this implies that majority of the respondents were processing at a minimal level. This implies that

Testing of Hypothesis

Hypothesis 1: There is no significant relationship between the level of involvement in the shea butter processing stages and the quantity of shea butter processed

Table 6.0: chi-square test of relationship between the level of involvement in the shea butter processing stages and the quantity of shea butter processed.

Variable	X^2	df	P	Remark	Decision
Actively involved					
Moderately involved	20.891	2	0.000	S	Reject H_0

$p < 0.05$ – significant (S); $p > 0.05$ – not significant (NS); df – degree of freedom

Source: Field survey data, 2012

The chi-square results shows that the level of involvement in shea butter processing stages was significantly related to the quantity of shea butter processed, this implies that respondents that were actively involved in the processing stages, tend to improve their skill over time and pay more attention in a bid to enhance the quality and quantity of butter processed.

Hypothesis 2: There is no significant relationship between the factors associated with processing Shea butter and the quantity of shea butter processed

Table 8.0: chi-square test of relationship between factors associated with shea butter processing and the quantity of shea butter processed.

Variable	X^2	df	P	Remark	Decision
Climatic factors	13.184	2	0.001	S	Reject H_0
Technological factors	26.334	2	0.000	S	Reject H_0
Economic factors	1.640	2	0.440	NS	Accept H_0
Physical factors	13.728	2	0.001	S	Reject H_0

$p < 0.05$ – significant (S); $p > 0.05$ – not significant (NS); df – degree of freedom

Source: Field survey data, 2012

This study examined factors associated with shea butter processing, amongst which were climatic factors such as;(rainfall, sunshine, relative humidity, strong winds), technological factors such as ;(knowledge of improved technologies, expertise, availability of improved technologies), economic factors such as;(price, demand, income, access to credit facilities, cost of inputs, availability of market) and physical factors such as: (availability of water, fuel wood, transport facilities). The chi – square results indicated that climatic, technological and physical factors were significantly related to the quantity of shea butter shea butter processed in the study area. As these factors directly or indirectly affect the quantity of butter processed. Climatic factors such as rainfall plays a very important role as an alternative source of water which is an important input in the processing stages of shea butter, sunshine also plays a prominent role in the processing stages as the nuts are dried with the aid of sunlight, as most of the processors cannot afford new technologies like solar dyers, blowers etc. Another major factor that had a significant relationship with quantity of butter processed was the technological factors, this implies that if respondents had access to improved technologies like solar dyers, nut crackers, mixers, milling machines as reported by [7] that in Ghana women have adapted a corn mill to grind roasted shea nuts.

Other inventions include a kneading machine, grinders, a hydraulic hand press, solar dryers (locally made wooden drying machines), and a heater and mixer. Some of these inventions have achieved extraction efficiencies of 60% to 85%. Technical knowhow on how to manage these technologies, there will be an improvement in the quantity and quality of butter processed which will in turn yield high income for the processors.

Hypothesis 3: There is no significant relationship between constraints faced by shea butter processors and the quantity of butter processed.

Table 7.0 : Chi-square test of relationship between constraints faced by shea butter processors and the quantity of shea butter processed.

Variable	X^2	df	P	Remark	Decision
Constraints	12.830	2	0.002	S	Reject H_0

$p < 0.05$ – significant (S); $p > 0.05$ – not significant (NS); df – degree of freedom;

Source: Field survey data, 2011

The analysis revealed that there is a significant relationship between the constraints associated with shea butter processing and the quantity of shea butter processed in the study, as transportation issues are widespread with high costs and limited reliability, as processors have to walk long distances to buy nuts, fetch water, and to even sell the butter. Inadequate extension services, as a large number of the processors are not aware of improved technologies, government policies for the shea butter processing enterprises. Lack of credit and water which are very important inputs in the processing stages of the butter. These issues contribute greatly to the quantity of shea butter processed in the study area.

V. CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions were made; most of the respondents were females. Majority of the respondents had no formal education shea processors major source of income did not come solely from shea butter processing as they engage in other income generating activities. Most of the respondents obtained information on shea butter processing from women associations. Majority of the respondents processed at the subsistence level. Majority of the respondents identified lack of water as a very severe constraint militating against shea butter processing. Rainfall and relative humidity were identified as the major climatic factors while knowledge and availability of improved technologies was identified as the main

technological factors associated with shea processing. Factors associated with shea butter processing were able to explain 41.3% of the variation observed in the quantity of shea butter processed. The following recommendations are given based on the conclusion reached above; Timely and regular trainings, seminars, workshops on new findings about shea processing technologies should be conducted for shea butter processors. Efforts should be made by the Government to provide basic infrastructural facilities like water, electricity, rural feeder roads to enhance the capacity of shea butter processors. Association of respondents with cooperative societies should be encouraged through extension education to boost their productivity in meeting up with the demands for domestic consumption, export and family bills. The Government can also ease the difficulties involved in the evacuation of Shea nuts from the wild through the provision of accessible roads and means of transportation. Credit facilities when given to the processors also, will boost their productivity to meet up with the domestic consumption and for export.

REFERENCES

- [1] Aqeela S, Tanuir A M and Mohammed Z 2005 Gender Participation in Livestock Production Activities and Their Consumption Trend of Proteinous Diet in Tehsil Fatch Jung. *Pakistan Journal of Agricultural Science* 42: 3-4
- [2] Becker, M. & Held D.C., (2001). Market Structure of *Vitellaria paradoxa* and *Parkia biglobosa* products. In: Teklehaimanot, Z., 2001. *Third annual report of Improved management of agroforestry parkland systems in Sub-Saharan Africa*, pp. 39-47.
- [3] Bonkougou, E. G. (2001). Monographie du karité, *Butyrospermum paradoxum* (Gaertn. f. Hepper, espèce agroforestière à usages multiples. Institute de la Recherche en Biologie et Ecologie Tropicale, Centre National la Recherche Scientifique et Technologique, Ougadougou. 69pp.
- [4] Common Fund For Commodities (CFC), FAO, CSE, Technical Paper No. 2, International Workshop On Processing And Marketing Of Shea Products In Africa Seminar Proceedings Dakar, Senegal 4-6 March 2002
- [5] Ernest Harsh (2001) Making trade work for poor women. *Africa Recovery journal*, Vol.15 No.4 pp.6, 2001.
- [6] Garba, I.D., C.N. Nwawe and I.L. Oisakede, 2011. The potentials of shea nut tree to the Nigerian Economy. *Int. J. Agric. Econ. Rural Dev.*, 4: 62-72.
- [7] Julius Najah Fabil (2007) Research and development of Shea tree and development of sheatree and its product. [http:// www. solutions-site.org/cat11-so11/19.htm](http://www.solutions-site.org/cat11-so11/19.htm)
- [8] Lovett , P.N (2004) *Research and Development of Premium Quality Shea Butter for Promotion Northern Ghana* (July 2001-March 2004), various reports to Techno Serve-Ghana, R&D support with funding from USAID.
- [9] Masters, Eliot. (2000). The shea project. *National Environment Management Authority Newsletter (NEMA) News*, 2(5), 14. Retrieved April 2, 2004, from <http://www.nemaug.org/nemanewsmay001.pdf>
- [10] Niess, T. (1988). Technologie appropriée pour les femmes des villages. Développement de la presse à karité au Mali. Deutsches Zentrum für Entwicklungstechnologien, Deutsche Gesellschaft für Technische.
- [11] Nikiema, A. & Umali, B.E., (2007). *Vitellaria paradoxa* C.F. Gaertn. In: van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA 14: Vegetable oils/Oléagineux. [CD-Rom]. PROTA, Wageningen, Netherlands.
- [12] Schrechenberg, K. (1996). Forests, fields and markets: a study of indigenous tree products in the woody savannahs of the Bassila region, Benin, PhD thesis, University of London. 326pp.

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