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ASSESSMENT OF USAGE OF UPGRADED INDIGENOUS SHEA BUTTER PROCESSING TECHNOLOGY BY WOMEN PROCESSORS IN KWARA STATE, NIGERIA

Matanmi B.M., Adesiji G. B, Olasheinde E. M., And Oladipo F. O.
Department of Agricultural Extension and Rural Development
University of Ilorin, Ilorin, Nigeria.
E mail: drgbolaadesiji@yahoo.com

ABSTRACT

The study was carried out in Agbaku-Eji in Moro Local Government Area of Kwara State, Nigeria, to assess the usage of upgraded indigenous Shea Butter Processing Technology by Women processors. All the 61 members of the Shea Butter Cooperative Society was used for the study. An interview schedule was used to obtain information from the respondents. Statistical analysis such as frequency counts and percentages were used to analyse the data. Chi-square was used to test the stated hypothesis at 0.05 level of significance. The result of the study showed that the mean age of the respondents was 45 years, they were all married .and 77% of the respondents have had no formal education, 54.1% had over 15 years of experience in Shea butter processing and 95% earned over N50,000.00 as their annual income from Shea butter. About 91.8% engaged in Shea butter processing as the main source of livelihood. The study further showed no significant relationship between level of usage of Shea butter upgraded technology and socio-economic characteristics of women processors. However, there was significant relationship between Shea butter processing and usage of upgraded technology. Despite the constraints experienced by the women processors, the study revealed that they preferred the use of the new technology that is, upgraded technology to the indigenous method they were used to. The study recommends the promotion of upgraded technology by Raw Material Research and Development Council, the Federal and State Governments and Private Sector Investment to all Women Shea Butter Processors in Nigeria.

Key words: Upgraded Technology, Women Processors, Shea Butter Processing.
Correspondence Author: Dr. G.B. Adesiji drgbolaadesiji@yahoo.com

INTRODUCTION

Shea tree, *vitellaria paradoxa* also known as *Butrespermum paradoxa* is of the family sapotasceae. It is typically a Savannah woodland tree that grows in the wild and exclusively found in Africa. It extends naturally from Eastern part of Senegal to the high plateau of Uganda forming

almost unbroken belt of 500 km long and 500 km wide (Jean Marco B;Christ elle F; Haby S. and Celine C (2004). There are two sub-species among the species *V. paradoxa subsp paradox* and *V. paradoxa sub sp-nitotica* (Hall, et al 1996). The shea tree flourishes best in the wild and is not easily cultivated. Generally, planted seedlings, even if grow into trees, tend not to produce usable nuts. However, Mali has had some success in replanting certain varieties of shea trees on a wide scale, and an experimental shea plantation has been started in Burkina Faso, near the town of Nongressmassom, with some initial encouraging results. The most immediate challenge, though, is to protect the existing trees (Harsh, 2001). The shea tree has names across the globe, the English call it "shea" a vernacular name in Bambara language while the French call it "karate" a name given to it in Senegal by Wolofs. It is called Nku in Ghana, some Lulu in Sudan as Efuguru, Kokoro, Komere, yao by the Ugandans. In Nigeria, the Hausas call it "mankade", the Ibos all it Okwuma and the Yorubas call it Igi-emi (Daniel, Olafimihn, Kwaya, and Odejide 2005). In Nigeria, the tree also occurs in the wild. It thrives within the Guinea and Sudan savannah areas as well as the lowest sahel regions of the country. Though, it appears to be a rather obscure wild species, it is widely known value and exploited by the natives in all areas where it occurs (Daniel et al (2005). Shea butter, a fatty extract from the seed of shea tree is known to contain a number of ingredients that moisturizes and heals skin aliments. Making of shea butter is exclusively a female activity. The transformation of shea nuts into butter is a difficult task. The process involves intensive physical labour as well as considerable amount of water and firewood. The preparation process takes several days and involves many stages.

The steps in the Nigeria traditional shea butter processing is 14, Deanil et al (2005). These steps are:

(1) Gathering of shea fruits from wild by women and children.
(2) De-pulping involving the removal of the fleshy pericarp.
(3) Boiling for 4 hours in cast aluminum or clay pots to terminate the germination process.
(4) Sun drying after boiling of the nuts for 5 10 days to reduce the moisture content and easy shelling.
(5) De-husking and winnowing.
(6) Sun drying to reduce moisture.
(7) Roasting to dehydrate the nuts for release of butter.
(8) Crushing of roasted nuts with mortar and pestle or grinding stone usually with mortar and pestle or grinding stone.
(9) Milling of nuts into a fine paste.
(10) Kneading to break up oil cells for easy butter extraction.
(11) Mixing and churning with cold water to obtain floating grey mass.
(12) Boiling to separate the oil from other impurities in the scooped floating grey mass..
(13) Decanting: the oil is left to settle over night so as to ensure proper separation of the oil from the residue.
(14) Settling and packing: The decanted oil is stirred to facilitate rapid solidification and the

cooling process. The resultant fat is poured into a basin where it is left to solidify as the shea butter.

The Raw Material Research and Development Council (RMRDC), has initiated a project to upgrade traditional method of processing shea nut in Nigeria. The overall objective is to eliminate drudgery involved in the local processing, improve the quality and quantity of shea butter product obtainable. This objective has been achieved by countries like Ghana and Sudan. RMRDCS has introduced equipment to improve steps (crushing, milling and kneading) operations of traditional method. The crushing process, traditionally done with mortar and pestle is replaced with a hammer mill, while milling which is done using grinding stone is replaced with a modified (corn) mill. Corn mill was adapted to grind crushed roasted shea nuts into fine paste. A kneading machine has been fabricated and introduced to replace the traditional manual and pedal kneading process (Daniel et al 2005).

Raw material Research and Development Council (RMRDC), is an agency in the Federal Ministry of Science and Technology with the mandate to promote development and utilization of Nigeria's industrial raw materials. Since 1987, RMRDC has been in the pursuit of this mandate; some of the developmental projects undertaken by the Council spread all over the States of the Federation of Nigeria; they include Fruit juice plant in Kaduna, Kaduna State; integrated Livestock/poultry project, Bisichi, Jos, Plateau State; Dairy Project, Gembu, Mambilla Plateeau, Taraba State, integrated groundnut processing plant, Sokoto, Sokoto State, and many others.

In Nigeria, shea tree is begining to gain attention especially with the Federal Governments increasing awareness of it importance as an industrial crop with potentials for foreign exchange earnings, even as the nation tries to diversify the economy from oil, thus motivating Raw Materials Research and Development Council (RMRDC) to delve into upgrading the indigenous method of production. The upgraded shea butter technology is an intervention aimed at reducing the drudgery local people experience in shea butter production. The study therefore sought to find answers to the following questions.

(1) what are the Socio-Economic characteristics of women shea butter processors.
(2) What is the level of involvement of respondents in shea butter processing?
(3) Are the respondents aware of the upgraded technology?
(4) Is the technology available?
(5) Are they trained on the use of the technology?
(6) What are the perceived benefits of the upgraded technology?

The general objective of the study is to assess the shea butter upgraded technology by women processors in Moro Local Government Area of Kwara State, Nigeria. The specific objectives of the study are to;

(1) Examine the Socio-economic characteristic of the respondents
(2) Determine the level of involvement of the respondents in shea butter processing;
(3) Examine the perceived benefits of the upgraded technology by the respondents;
(4) Determine the problems or constraints in the use of the upgraded technology by the respondents.

METHODOLOGY

The study was carried out at Agbaku-Eji in Moro Local Government Area of Kwara State, Nigeria. The study was carried out in the study area because the upgraded shea butter technology is located in the area by Raw Materials Research and Development Council and shea butter is produced in the study Area. The population for the study consisted of the women who are involved in shea butter processing in the study area. The sample frame for the study consisted of all the members of shea butter processors cooperative society in the study area. All the sixty one (61) members of the cooperative society were selected and interviewed for the study. An interview schedule was used in collecting data for the study. Results of the study were presented in tabular forms using frequency distribution and percentages. Chi-square statistics was used in testing the stated hypothesis.

Measurement of Variables

The demographic characteristics of respondents variables included in the study are; age, marital status, years of experience in shea butter processing, income from shea butter processing and level of education. Age was measured in years and categorized into four categories. Marital status was measured as single, married and widow. Educational level was measured as no formal education, adult education, primary education and secondary education, Years of experience in shea butter processing was measured in years. While income from shea butter processing was measured in naira.

The respondents' perceived the benefits derived from the upgraded shea butter technology was measured on a four-point Likert-type scale ranging from strongly agree, agree, disagree and strongly disagree.

RESULTS AND DISCUSSION

Respondents' Demographic characteristics. This section presents information about the demographic characteristics of the respondents. This includes age, marital status, educational qualification of respondents, years of experience in shea butter production and income from shea butter production per year.

Table 1: Distribution of the Demographic Characteristics of Respondents (N=61)

Variables	Frequency	Percentage
Age Categories (yrs)		
≤ 20	0	0
20 29	2	3.3
30 39	9	14.7
≥ 40	50	82.0
Marital Status		
Single	0	0
Married	58	95.1
Widow	3	4.9
Educational Level		
No formal education	47	77.0
Adult education	3	4.9
Primary education	9	14.8
Secondary education	2	3.3
Years of Experience In shea butter processing		
0 5	5	8.2
6 10	8	13.1
11 15	15	24.6
Above 15	33	54.1
Income (N=000)from shea butter processing per year		
Above N50,000	58	95.1
40 49,000	2	3.3
30 39,000	1	1.6

Source: Field Survey (2008).

Table 1 shows that about 82.0% of respondents were 40 years of age and 3.3% are between 20 29 years while 14.7% were between 30-39 years. This shows that shea butter processing business is a serious business that cannot just be easily entered into by teenagers except by lending assistance to their mothers as they (the mothers) also did as small girls.

The Table also shows that married women engaged in the shea butter processing business (95.1% being married and 4.1% being widows). Table one further revealed that 77% of the respondents have had no formal education with only 3.3% had secondary education. This shows

that educational qualification is not a requirement for the business, rather interest and skill. Table further shows that 8.2% of the respondents have had more than 5 years of shea butter processing experience while 54.1% had over 15 years of experience. Majority of respondents (95.1%) realized more than N50,000 per annum from sales of shea butter. This means that they are able to realize some amount of money from shea butter processing.

Table 2: Distribution of Respondents on basis of Processing and sources of interest in shea butler processing (N=61).

Variables	Frequency	Percentage
Basis of Processing		
Full time	56	91.8
Part time	5	8.2
Source of interest		
Prevailing Occupation	49	80.3
Source of Livelihood	4	6.6
Neighbours	6	9.8
Personal Interest	2	3.3

Source: Field survey (2008)

Tables 2 revealed that majority of the respondents (91.8%) are involved in shea butter processing on full time basis while 8.2% are involved on part time basis. Table 2 further revealed that 80.3% of the respondents got into shea butter processing because it is the prevailing occupation in the community, while 3.3% are involved because of personal interest they had in shea butter processing.

Table 3: Distribution of Respondents on the Awareness, Accessibility and Training on use of upgraded shea butter technology (N=61).

Variables	Frequency	Percentage
Awareness		
Aware	61	100%
Not aware	0	0
Accessibility to upgraded		
Technology		
Accessible	61	100%
No accessible	0	0
Training on Use of upgraded		
Technology		
Trained	54	88.5
Not trained	6	9.8
No response	1	1.6

Source: Field Survey (2008)

From Table 3, it can be observed that all the respondents are aware of the upgraded shea butter processing technology. This is an indication that the upgraded technology is no news to any members of the cooperative society; they were all duly informed and carried along about the new technology. Table 3 also revealed that all the respondents have access to the upgraded technology. The technology was designed for them in the study area to use in order to stir their interest in the new technology. The table also shows that 88.5% of the respondents received training on the use of the machine used in the new technology, 9.8% did not receive training while 1.6 gave to response to the question.

Table 4: Distribution of Respondents on perceive on benefits derived from upgraded shea butter technology. (N=61).

Perceived Benefits	Strongly Agree		Agree		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%
Improved appearance of shea butter	25	41,0	17	27,9	16	26,2	3	4,9
Improve more quality processed/ time	61	100.00	0	0	0	0	0	0
Increased income	23	37.7	18	29.5	17	27.9	3	4.9
Reduced Cost of production	30	49.2	7	11.5	22	36.1	2	3.2
Reduced drudgery of processing	61	100.00	0	0	0	0	0	0
Increased speed of processing	61	100.00	0	0	0	0	0	0
Increased popularity of the village	51	83.6	10	16.4	0	0	0	0
Attracted Social amenities to the village	0	0	0	0	8	49	53	95.1
Technology attracted new customers	0	0	0	0	0	0	61	100.00

Source: Field survey (2008)

Analysis presented in Table 4 shows that 41.0% of the respondents strongly agreed that the upgraded shea butter technology improved shea butter appearance quality while 18% disagreed with this assertion. This implied that shea butter processed using upgraded technology is less contaminated due to exposure than the indigenous method. Table 3 further showed that the new technology encouraged more quantity processed per time as all the respondents strongly agreed with this assertion. The respondents had mixed reactions to the benefits derived in terms of income because 37.7% strongly agreed that the new technology increased their income, while 29.5% agreed that it increased their income and 27.9% disagreed that it increased their income while 4.9% strongly disagreed that the new technology increased their income. However, all the respondents strongly agreed that the new technology increased the speed of shea butter production. This means that it now takes fewer days to complete the processing of shea butter. This is one of the goals of the innovation that is to increase the quantity of shea butter produced as opined by Davila et al (2006).

Table 5 Problems with the upgraded shea butter Technology.

Components		Always		Occasionally		Never	
Crushing							
		No	%	No	%	No	%
(a)	Seeds escape	-	-	-	-	61	100
(b)	Difficulty operating Machine.	-	-	61	100	-	-
(c)	Machine malfunction	-	-	61	100	-	-
(d)	High cost of Maintenance Milling	39	63,9	13	21.3	9	14.8
(a)	Do not have sufficient Supply of water	-	-	-	-	61	100
(b)	Availability of operated	52	85.2	9	14.8	-	-
(c)	The machine is over labored each in use.	61	100	-	-	-	-
Kneading							
(a)	Do you operate the machine	-	-	-	-	61	100
(b)	Cost of maintenance is high.	38	-	1	1.6	22	36.1
(c)	Enjoy the use of the Technology.	61	100	-	-	-	-

Table 5 shows that the seeds do not escape during crushing, unlike the traditional methods where seeds escape when mortals and pestle are used. The table also shows that there is no problem in operating the machine; this is because there is a person who operates the machine for the respondents. The respondents claimed the machine malfunctions occasionally. There are verities of opinions on the cost of maintaining the machines as shown in the table. About 63.7% claimed three is always a high cost to maintain the machine, 21.3% claimed there is an occasional problem and 14.8 claimed there is never a problem. All the respondents claimed the machine is over labored each time in use. More than half of the respondents claimed the cost of maintenance of the machine is high even though all the respondents enjoy the use of the technology.

Testing of Hypothesis

H_o: There is no significant relationship between shea butter production and level of usage of upgraded technology.

Table 5: Chi-square Analysis of the Relationship between shea butter Production and usage of upgraded Technology.

Variable	Chi-square value	df	cc	P value	Decision
Source of attraction	8.120	6	0.5966	0.09	NS
Quantity produced	1.480	4	0.148	0.038	S
Quantity obtained	4.600	4	0.090	0.041	S
Basis of Processing	5.490	2	0.035	0.035	S
Stages of processing	6.240	2	0.052	0.034	S

Source: Field Survey (2008).

From table 5 presents result of tested hypothesis. Analysis reveals a significant relationship between usage of upgraded technology and quantity produced (χ^2 =1.480, P<0.05); quantity obtained (χ^2 =4.600, P<0.05), basis of processing (χ^2 =5.490, P<0.05) , stages of processing (χ^2 =6.240, P<0.05). Table 5 further shows that there is no significant relationship between usage of upgraded technology and source of attraction (χ^2 =8.120, P>0.05).

CONCLUSION

Based on the findings of this study the following conclusions are drawn up. (1) Majority of the respondents are 40 years and above, they had no formal education, 54.1% had 15 years or more in shea butter processing with majority making over N50,000.00 per year from shea butter process. (2) About 91.8% were involved in shea butter processing on full time basis, about 80.3% were involved because it is the prevailing occupation in the community.. (3) The drudgery of processing shea butter has been reduced by the new innovation introduced into the study area that is, upgraded shea butter technology. The speed of processing has increased. The quantity of shea butter produced has increased with the new technology. (4) The problems with the new technology is that there is always a high cost of maintenance of the machine, machine operators are not always available and the machine is always over labored each time in use.

RECOMMENDATIONS

Based on the findings of this study and as expressed by the respondents, the following recommendations are made (i) Due to the invaluable relevance and potentials of shea butter, promotion of this new technology should be carried out by both the initiating agency, the state and the Federal governments. In order to sensitize and encourage private investors, local, state and the federal government should replicate the centre in various places all over the federation. This will hasten the speed of diffusion of the upgraded technology. The initiating agency and governments at large should endeavour to source for market for the women both locally and internationally. This will reduce the running cost and encourage usage. The initiating agency has done well by coming

up with such an innovation. However, the technology can still be improved upon so as to mechanize the whole process. Other relevant research institutes should contribute by perfecting the technology and bring it to highly desired and acceptance both locally and internationally.

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