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Full Length Research Paper

Rural youths participation in adoption of improved shea nuts collection and processing in Niger State, Nigeria

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Abstract

The study was carried out in agricultural zone 1 of Niger State which consists of eight (8) local government areas, namely Lapai, Agaie, Katcha, Bida, Gbako, Lavun, Edati, and Mokwa. The study assessed the rural youth participation in adoption of shea nuts collection and shea nuts processing technologies. The specific objectives were to; determine the level of adoption of improved Shea nuts processing technologies, the productivity of adoption of improved shea nuts collection in the study area. Data for the study were collected using questionnaires for 150 rural youth Shea nuts processors. The study revealed that majority (60.00%) were youth and 100% of these processors were female. The result also showed that 100 percent of the processors adopted most of the improved shea nuts processing technologies, with the exemption of parboiling, sorting/grading, storage of shea nuts, deodorant of shea butter and storage of shea butter. The result indicated that improved shea nuts processing technologies had significant relationship at 0.05% probability level with adoption of improved shea nuts processing technologies. The major constraints affecting the youth participation were high cost of technologies, inadequate credit facilities and poor marketing of product. The study concluded that there was high percentage of rural youth participation on the adoption of improved shea nuts processing technologies in Niger State.

Key words: Rural, youths, adoption, shea nuts, processing, technology**.**

INTRODUCTION

Agriculture plays an important role in economic growth, food security, poverty reduction and rural development. It is the main source of income for around 2.5 billion people in the developing world (FAO, 2003). Smallholder agriculture is identified as a vital development tool for achieving integrated rural development programmes, one of which is to have the people suffering from extreme poverty and hunger in a short period of time (World Bank, 2008).

However, majority of smallholder processors relies on traditional methods of production and this has lowered the level of productivity. For instance, over 90% of the shea nut processors in the developing countries used traditional methods of production (Lovett, 2004). Agricultural technologies include all kinds of improved

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techniques and practices which affect the growth of agricultural output (Jain, Arora and Raja. (2009).

Adoption of improved agricultural technologies has been associated with: higher earnings and lower poverty; improved nutritional status; lower staple food prices; increased employment opportunities as well as earnings for landless laborers (Kasirye, 2010). Adoption of improved technologies is believed to be a major factor in the success of the green revolution experienced by countries (Ravallion and Chen, 2004; Kasirye, 2010). On the other hand, non-adopters can hardly maintain their marginal livelihood with socio-economic stagnation leading to deprivation (Jain *et al.*, 2009).

A new agricultural technology that enhances sustainable production of food and fiber is therefore critical for sustainable food security and economic development. This has made the dynamics of technical change in agriculture to be an area of intense research since the early part of twentieth century (Loevinsohn, Sumberg and Diagne, 2015). These technologies are particularly relevant to smallholder processors in developing countries because they are constrained in many ways, which makes them a priority for development efforts. These farmers and processors for instance, live and farm in areas where rainfall is low and erratic, and soils tend to be infertile. Agriculture remains a family enterprise in Nigeria, as youth, women and men of all ages are involved in one way or the other in the agricultural production process. The implication raised by this is that, concerted effort by everybody capable of potential contribution(s) to the agricultural development process is required, if Nigeria is to make a realistic and positive step in solving its agricultural problems (Akinola and Akindiji, 1991; Ekong, 2003).

Shea tree is one of the most important tree species in Africa, (Vitellariaparadoxa C. F.Gaertn.) owing to its high potential in contributing to reduction of rural poverty, hunger and disease and enhancing environmental sustainability. The fruit pulp, which has excellent nutritional content is widely consumed among indigenous peoples of Africa (Ugese, Ojo and Bello, 2005); (Maranz, and Wiesman, 2003). While among some ethnic groups, the flowers are made into fritters (ICRAF, 2000). Locally, the oil is used as a cooking fat while in Europe and Japan, it is used in chocolate manufacturing (Umali and Nikiema, 2002). Caterpillars of Cirinabutyrospermi, associated with the species are eaten by some ethnic groups in Nigeria such as the Yoruba, Nupe and Tiv (Ande, 2004; Ugese*et al.,* 2005). Shea butter is also used in production of cosmetics (Boffa *et al*., 1996). Other names of shea-butter tree (English), (Bambara) Ka'danya (Hausa), kareje (Fulani), lulu (Arabic), karité (French).

German International Corporation (GIZ), is an international non-governmental organization (NGO) that is based in Niger State for decades with the aim of improving the living standard of rural people and reducing poverty by value addition to livelihood activities through groups and community participation in the value chain activities which will increase their productive capacities and income generation. In 2007, GIZ took shea nuts collection and shea nut processing as a value chain capacity building programme because it is one of the major livelihoods activities of rural dwellers in Niger State (Suleiman, 2008). The adoption of these packed technologies was achieved through participatory approach in group sensitization and formation, technology dissemination and training of shea nuts processors in different communities through use of farmer field schools in adopting the best practice (technologies) (GIZ, 2008). The objectives of the programme was to improve the quality and standard of shea butter production to the international market standard and also increase livelihood activities of the rural people in Niger State.

Thus, there is urgent need to educate youths to know the importance and prospects in farming and take to it, thereby increasing the farming population. More so, the youth need to appreciate the role of agriculture, stay back in the villages where there are abundant resources and make use of what they have in productive activities. This will really support the extension workers, who are already short in number compared to the farmers that have to be reached (Eremie, 2002).

The current challenges in development are so demanding that only the participation of people who are energetic, creative, innovative, productive and committed who could bring development, should they all be mobilized. (Arokoyo, 1992; Mgbada, 2000; Solanke, 2004). These attributes which are critical to growth and development are substantially discernable in the youth. Thus, they constitute the major resource base for any country that wants to embark on any meaningful agricultural and rural development (1997).

In view of the foregoing analysis, it is therefore very important to carry out a study to assess the rural youth participation in adoption of improved shea nut collection and shea butter processing technologies. The broad objective of this study was to assess the rural youths' participation in adoption of improved shea nuts collection and processing in Niger state. The specific objectives were to; examine the level of adoption of improved shea nuts collection and shea nuts processors in the study area and determine the productivity of improved shea nuts collection and shea nuts processors in the study area.

MATERIALS AND METHODS

The Study Area

The study was conducted in Niger State which is located in the North Central zone of Nigeria and has its capital in Minna. It lies between latitude 3°–10°C N and

longitude 3°–8°E. It is bordered in the north by Zamfara State, to the North East by Kebbi State, to the south by Kogi State, while Kaduna State and the Federal Capital Territory (FCT) bordered the state to the north-east and south-east. The state also shares a common international boundary with the Republic of Benin at Babanna in Borgu Local Government Area. This gives way to common inter-border trade with the state. The state has a land mass of 76,363 $Km^2$and has twenty-five (25) local Government Areas. It is divided by Niger State Agricultural Development Programme into three agricultural zones for better agricultural administrative activities, namely: zone, I, II, and III with headquarters at Minna. The zones have their headquarters at Bida, Kuta, and Kontogora respectively.

The state falls in the guinea savannah zone and has a climate and ecological conditions that favored agricultural production. It has an annual rainfall of between 1100mm – 1600mm and has an average temperature of 35^oC. The state has abundant wild vegetation of Shea trees and is dominated by small-scale farmers. Based on the 2006 National Population Census, the state has a total projected human population of 4,250,429 as at 2003.

A multistage random sampling technique was used for the selection of the local government areas and processors. Three local governments areas were purposively chosen from the total number of eight local government areas in zone one of the state agricultural zone. The reasons for the selections were based on the observed degree of rurality and the presence of many rural youths who are engaged in shea nut processing activities (Suleiman, 2008). The second stage involve a random selection of 150 processors as sample size which represent 37 percent of the sample frame of 412 processors as registered processors with Niger state Agricultural Development and Mechanization Agency (NAMDA), state Ministry of cooperative and women affairs and GIZ State Field Office in Minna as shown Table 1 and to whom the structured questionnaire were administered.

Data were collected through the aid of structured questionnaires and interview schedule, and analyzed using descriptive statistics such as tables, percentages, frequency distribution and inferential statistics such as binomial logistic regression model, multiple regression techniques and correlation analysis. Generally, data were organized and analyzed using Statistical Package for Social Sciences (SPSS)

The binomial logistic regression model is specified as follows;

$Y= \beta_o +\beta_1X_1+ \beta_2X_2 +\beta_3X_3 + \beta_4X_4+ \beta_5X_5 +\ldots\ldots\ldots\ldots\ldots\ldots \beta_nX_n$ ….. (1)

Where Y; = 1 if the adoption level of the specified improved Shea nuts processing technology is high, 0 if the adoption level is low

Age (X_1)
Gender (X_2)
Marital status (X_3)
Education (X_4)
Household size (X_5)
Processing experience (X_6)
Extension contact (X_7)
Processing centre (X_8)
Cooperative membership (X_9)
Quantity (X_{10})
Constraints (X_{11})

Pearson correlation coefficient was used to test hypothesis one while hypotheses two and three were tested using Pearson product moment correlation (PPMC).

RESULTS AND DISCUSSION

Age of processors

The result in Table 2 shows that majority (60.00 %) of the respondents were in the youthful age of equal or less than 30 years .This implies that majority of the youth were in their productive age, where their energies could be harnessed and utilized for productive venture in agriculture especially Shea nuts processing activities. Thus, it could be concluded that the youths in Niger State were full of life and vigour and can contribute their efforts; physically, mentally and otherwise to boost Shea butter production in Niger State. Similarly, their relatively young age may make them receptive to innovations unlike the older ones who usually expect the maintenance of status quo. Nnamdi and Akwiwu (2005) who also reported that age influences adoption level and those older processors adopt less of improved Shea nuts processing technologies.

Gender

The results in Table 2 reveals that all (100.00%)of the rural youth processors were female. This implies that Shea nuts processing is mainly undertaken by women with higher percentage of rural young women and lower percentage of old women. This is in conformity with the findings of Lovett (2004) and Lovett (2007) who in their studies reported that Shea nuts picking and processing of nuts into butter is traditionally done by women. According to Adewale *et al*. (2003), gender is not a barrier to active involvement in Shea butter production activities. However, Oladeji *et al*., (2003), observed that it is generally believed that males are often more energetic and could readily be available for energy demanding jobs like Shea tree plantation management.

Marital Status

The result in Table 2 also indicates that majority (78.00%) of the rural youth Shea nuts processors were

Table 1. Sample Frame and Sample Size for Rural Youth Shea Nuts Processors in Niger state.

LGA/Extension Block	Sample Frame	Sample Size	%
Gbako	118	43	28.66
Katcha	143	52	34.66
Agaie	151	55	36.66
Total	412	150	100.00

Table 2. Rural youth processors' Socio-Economic Characteristics and Institutional variables (n=150).

Socio-Economic Characteristics	Frequency	Percentage
Age		
< =30	90	60.00
41 – 50	40	26.67
51-60	20	13.33
Gender		
Female	150	100.00
Marital Status		
Married	117	78.00
Single	33	22.00
Education		
Primary	14	9.33
Secondary	8	5.55
Adult	128	85.33
Household Size		
1-5	5	3.33
6-10	35	23.33
11-15	90	60.00
Above 15	20	13.33
Processing experience		
Less than 5	2	1.34
6-9	62	41.34
>10	86	57.34
Extension contact		
Yes	122	81.33
No	28	18.67
Processing centre		
Yes	91	60.67
No	59	18.67
Membership of association		
Yes	120	80.00
No	30	20.00

Source: Field survey, 2012.

married. This implies that majority of the shea nuts processors in the study area have additional responsibilities of catering for their households and this could ginger them to look for additional fund to cope with their social, economic and moral support to their wards.

Level of Education

Table 2 reveals that most of the rural youth processors only attended adult literacy classes. This implies that processors had very low level of education. However, only educated farmers are reported to be analytical and to observe easily the obvious advantages of the technologies. The studies of Ohajianya and Onu (2005) and Nnadi and Akwiwu (2006) associated education with increased participation and adoption of agricultural technologies. The implication of education in agricultural production according to Arnon (1987) is that education is an important socio-economic variable and a form of human capital for agricultural development. Similarly, Ogunbameru (2001), noted that education will

likely enhance the adoption of modern farm technologies by youth and thereby sustaining a virile farming population. Ojukaiye (2001) posits that education is an important socio-economic factor that influences farmer's decision because of its influence on the farmer's awareness, perception, reception and the adoption of innovation that can bring about increase in production.

Household Size

Ojuekaiye, (2001) defined household size as the number of people eating from one pot. It implies that the consumption unit is also the production unit. Family composition is an important variable in agricultural production because:
(a) The available work force is obtained from it; and
(b) size of farm-land is sometimes related to it.
In relation to the above, the results in Table 2 revealed that majority (60.00%) of the Shea nuts processors had household size ranging from 11 – 15 people. Only few 3.33 percent of the rural youth processors had a household size 1-5 people. This implies that majority of the Shea nuts processors had large family sizes, which will provide family labour for processing. The mean household size of Shea nuts processors in the study area was 11 persons. The result agrees with the findings of Nnadi and Akwiwu (2006), that large family sizes predisposed adoption of innovation.

Processing Experience

Experience is gained with age. Considering the major occupation of the respondents which is farming, the length of time in farming can be linked with the age of the farmers. As the age increases among the farmers, their years of experience also increase.. The result in Tables 2 indicate that more than average (57.34%) of the rural youth processors had about 10 or more years of processing experience, and only 1.34% of the rural youth processors had less than 5 years of processing experience. This implies that the Shea nuts processors in the study area had acquired enough processing experience that will encourage them to adopt improved Shea nuts processing technologies. This result agrees with Nnadi and Amaechi (2007) who said that increased years of farming experience is a valuable asset in adoption decision making. However, Chukwuji (2010) pointed out the fact that with experience many farmers may stick to the old ways of farming rather than trying new techniques, probably due to their risk adverse tendencies.

Extension Contact

The result in Table 2 reveals that majority (81.33%) of the rural youth processors had contact with extension workers on the improved Shea nuts processing technologies.

Processing Centre

Processing centre is a place where series of activities of Shea nuts processing are carried out in order to achieve the processing of Shea nuts into Shea butter as final product. The result in Table 2 reveals that majority (60.67%) of the rural youth processors had processing centres. This implies that the Shea nuts processors had avenues to interact and share ideas about improved Shea nuts processing technologies which can facilitate the adoption of the technologies.

Membership in Cooperative Societies

The result in Table 2 shows that majority (80.00%) of the rural youth processors were members of one cooperative society or the other. This implies that the members stand a better chance of receiving assistance from government and non-governmental organizations (NGOs) or donor agencies. This disagrees with FCT-FDO (2006) that majority of farmers in the study area do not belong to cooperative societies. Nnadi and Akwiwu (2006) reported that women who belonged to cooperative societies adopted more improved technologies

Figure 1; Distribution of rural youth processors according to level of adoption

Legend;1=picking/collection of Shea nuts, 2=parboiling of Shea nuts, 3=drying of Shea nuts.4=de-husking of Shea nuts, 5=drying of Shea nuts, 6=sorting/grading of Shea nuts, 7=storage of Shea nuts, 8= drying of Shea nuts, 9=roasting of Shea nuts, 10=pounding of Shea nuts,11=grinding of Shea nuts,12=kneading/churning/washing of Shea nuts,13=boiling/clarifications of paste, 14=deodorant of Shea butter, 15=clarification of Shea butter, 16=packing of Shea butter, 17=storage of Shea butter.

Level of Adoption of Improved Shea nuts processing Technologies

The results revealed that all 100 percent of the Shea nuts processors adopted twelve (70.50%) of the available improved processing technologies, with the exception of five (29.50%) improved processing technologies namely par-boiling, sorting/grading, storage of Shea nuts, and deodorant of Shea butter and storage of Shea butter. This implies that the processors are already familiar with most of the technologies. This may be as a result of newness of these technologies or

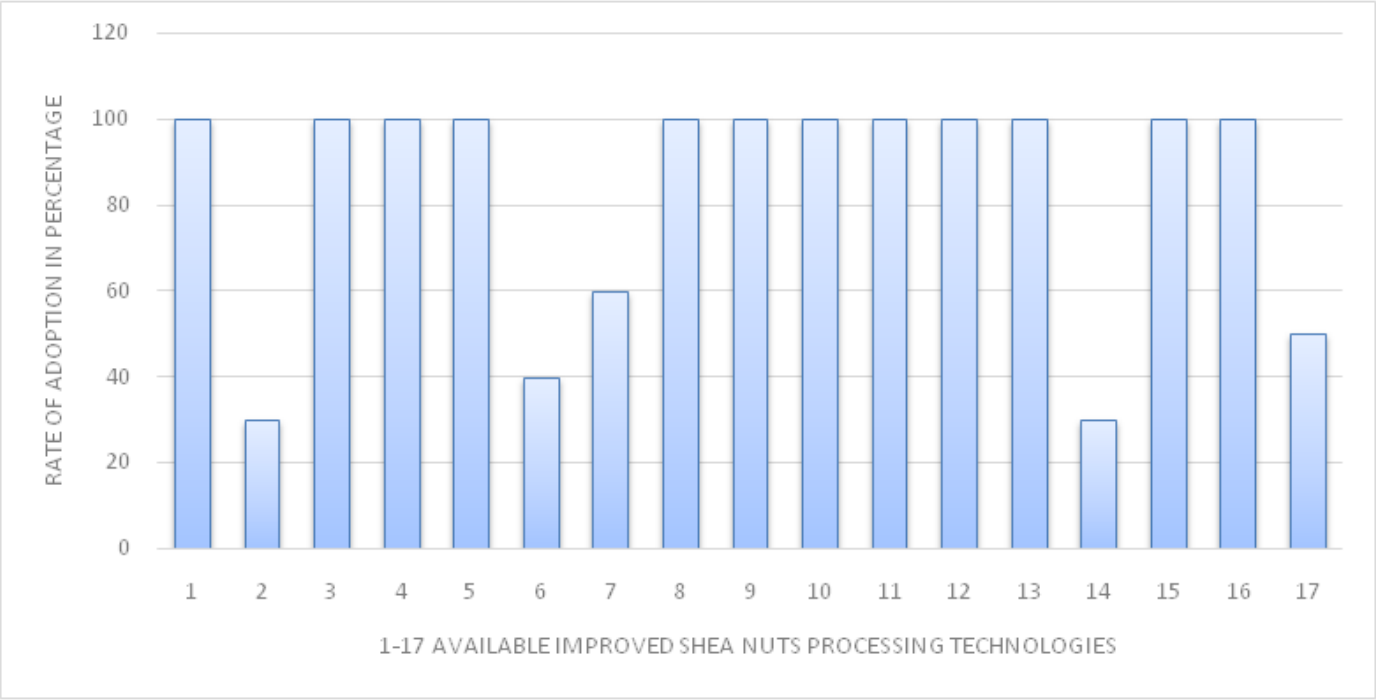

Fig. 1. Distribution of rural youth processors according to level of adoption.

certain attributes/characteristics such as time factor and lack of fund.

The null hypothesis stated that there is no significant relationship between socio-economic characteristics of rural youths and level of adoption of improved Shea nuts processing technologies. The socio-economic characteristics studied include age, sex, marital status, education, household size, processing experience, extension contact, processing centre and membership of association

The results in Table 3 reveals that processing experience (X_6) extension contact (X_7) and membership of cooperative (X_9) were significant at 1% level of significance and had positive relationship with the level of adoption of improved Shea nuts processing technologies. This implies that apart from easiness of access to production resources, processors that were members of cooperative organizations interact and share ideas on the advantages associated with adoption of improved shea nuts processing technologies. Similarly, marital status is a proxy of source of large household size which can serve as source of labour for the processors. Hence, Shea nuts processors that are married are most likely to have more helping hands in the processing of shea butter. This result is consistent with the findings of Egwu (2003) who found that married respondents play more active role in agricultural production and always influence adoption positively and even extend the technology to others due to their large household sizes. On the other hand, shea nuts processors with high frequency of extension contact are likely to have better information on improved shea nuts processing technologies.

The results also show that age (X_1) was negatively significant at 0.05% probability levels with adoption of improved Shea nuts processing technologies. This implies that younger Shea nuts processors adopt improved Shea nuts processing technologies more than older processors as old age is associated with weakness and skepticism, while youthful age is associated with virility and venture-someness. This result is consistent with Nnadi and Akwiwu (2005) and Oweremadu and Mathews-Njoku (2007) and Onyebinama (2000) that age had a significant negative relationship with adoption level, indicating that older farmers adopt less improved shea nuts processing technologies

The result reveals that quantity (X_{11}) of shea nuts/shea butter processed and constraints faced by the processors were positively significant at 0.05% probability levels with the level of adoption of improved Shea nuts processing technologies. This implies that the quantity of shea nuts collected and processed had significant impact in their income and livelihood in terms of improving the living standard of the processors. This also agrees with Suleiman (2008) that even with a low collection of shea nuts and shea butter processed plays a significant role in household food and income security of Niger State rural dwellers especially in zone

Table 3. Binomial Logistic Regression Result of Adoption Level and Some Socio-economic Characteristics.

Adoption level	Coefficients	Standard error	Z values	P>|Z|
Age	-.0669801	.0367528	-1.82	0.068NS
Marital status	2.26534***	.6837582	3.31	0.001
Educational level	.0949456	.0699154	1.36	0.174 NS
Household size	-.106529	.1474022	-0.72	0.470 NS
Processing exp.	.0315767***	.05135 4	0.61	0.539
Ext. contact	2.43678***	.4206358	5.79	0.000
Cooperative	2.26534***	.6837582	3.31	0.001
Quantity proc.	-.0009725	.0005503	-1.77	0.077NS
Constraints	-3.247832	1.954347	-1.66	0.097NS

Source; Field survey, 2012
N.B ** = Significant at 0.05% level, ***Significant at 0.01%.

Table 4. Pearson Relationship between the Productivity of rural youth's participation and the Level of Adoption of the Improved Shea Nuts Processing Technologies.

	Variables	Chi-square	Df	P-value	Remarks
1.	Picking/collection of Shea nuts	150.000[b]	1	.000	**Significant
2.	Parboiling of Shea nuts	150.000[b]	1	.000	**Significant
3.	Drying of Shea nuts	150.000[b]	1	.000	**Significant
4.	De-pulping of Shea nuts	150.000[b]	1	.000	**Significant
5.	De-husking of Shea nuts	150.000[b]	1	.000	**Significant
6.	Drying of Shea nuts	150.000[b]	1	.000	**Significant
7.	Sorting/grading	150.000[b]	1	.000	**Significant
8.	Storage of Shea nuts	150.000[b]	1	.000	**Significant
9.	Pounding of Shea nuts	150.000[b]	1	.000	**Significant
10.	Grinding of Shea nuts	150.000[b]	1	.000	**Significant
11.	Kneading/Churning	150.000[b]	1	.000	**Significant
12.	Washing of paste	150.000[b]	1	.000	**Significant
13.	Boiling of Shea nuts	150.000[b]	1	.000	**Significant
14.	Adding of deodorant	150.000[b]	1	.000	**Significant
15.	Clarification of Shea butter	150.000[b]	1	.000	**Significant
16.	Packaging of Shea butter	150.000[b]	1	.000	**Significant
17.	Storage of the Shea butter	150.000[b]	1	.000	**Significant

Source: Field survey, 2012.
N.B ** = Significant at 0.05 level.

one. Processing as a business is particularly important source of income for rural women and children. This also implies that the processors were very much interested in the Shea nuts processing despite the various constraints faced by them in the industry

Furthermore, education (X_3), household size (X_4) and processing experience (X_6) were not significant even at 0.10% probability levels. This is not consistent with the findings of Onyebinama (2000), Oweremadu and Mathews-Njoku (2007), that personal characteristics especially education influence adoption level. This agrees with Nnadi and Akwiwu (2006) that large family sizes predisposed adoption of innovation.

The result in Table 4 indicates that all the available Shea nuts processing technologies were significant at 0.05%. This signifies that all the processing technologies are paramount to the production of high quality Shea butter and attraction of additional income to their livelihood sustainability.

Hypotheses 2

Pearson Relationship between the Productivity of rural youth participation and the Level of Adoption of the Improved Shea Nuts Processing Technologies

The result in Table 4 reveals that all the technologies of improved Shea nuts processing had relationship at 0.05% probability level with adoption of improved Shea nuts processing technologies. This implies that the

Table 5. Constraints to effective participation in the adoption of improved shea nuts collection and sheanuts processing.

Constraint	Rank
High cost of equipment/technology	1st
Poor or inadequate credit facilities	2nd
Fear of marketing/patronage of products	3rd
Constant manpower to retrain	4th
Poor storage facilities	5th
Taking too much time to collect and process	6th
Difficulty in picking the nuts	7th

participation in the activities of improved Shea nuts processing technologies in the study area was high. Table 2 also shows the relationship between the available technologies and the rate of adoption of improved shea nuts processing technologies in the study area. This agrees with many authors (Boulding, 1977, Ajayi, 2005, that the involvement of rural women youths in agricultural production has been significance to the country's economic development and that empirical evidence has shown that rural women youths perform activities such as hoeing, sowing, weeding, harvesting, processing and related agricultural production.

CONCLUSION AND RECOMMENDATION

The study shows that the rural youth processors' participation in the activities of improved shea nuts processing technologies in the study area was high as they adopted most of the improved shea nuts processing technologies. Although, a few technologies were adopted at low level due to some constraints that were associated with the technologies and institutional constraints such as high cost of technologies, inadequate credit, poor storage facilities and poor marketing of the products during the wet season.. The study, therefore recommended creating of enabling environment through the provision of basic infrastructural facilities that will encourage the adoption of the available processing technologies in the study area.

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