FUDMA Journal of Sciences (FJS)
ISSN online: 2616-1370
ISSN print: 2645 - 2944
Vol. 5 No. 1, March, 2021, pp 37 – 46
DOI: https://doi.org/10.33003/fjs-2021-0501-535

GENDER BASED ANALYSIS ON ACTIVITIES OF *Parkia biglobosa* (Jacq) G. Don AND *Vitelleria paradoxa* (C. F. Gaertn) VALUE CHAINS IN DERIVED SAVANNAH ZONE OF NIGERIA

[1]Olayemi, O. T., [1]Lawal, K. J., *[2]Salami. K.D. and [1]Oyerinde, O.V.

[1]Department of Forestry and Wood Technology, Federal University of Technology Akure, Nigeria
*[2]Department of Forestry and Wildlife Management, Federal University Dutse, Jigawa State, Nigeria.

*Corresponding Author's Email: foristsalam@yahoo.com; salami.d@fud.edu.ng , +2347034294371

ABSTRACT
The research examined the gender based activities on *Parkia biglobosa* and *Vitelleria paradoxa* value chains in derived savannah zone of Nigeria using Oyo State as a case study. The research survey design was adopted which involved administration of semi-structured questionnaires of one hundred and twenty (120) respondents in two Local Government areas of Oyo State namely: Atisbo and Saki. The study areas were purposively selected based on the abundance of the selected Non Timber Forest Products (NTFPs). The data were analysed using descriptive statistic. The result showed that farm had the highest number of seeds for collection (48.3% and 41.7%) of *Parkia biglobosa* and *Vitelleria paradoxa* followed by community forests. Greater percentage of the population of Shea butter and Parkia producers in the study area were dominated by aged group which were mostly women. Produce were mainly for local consumption while a few numbers attract the larger domestic and international markets. Therefore, it is recommended that government should help in providing simple, easy technology that will facilitate good hygiene practices, packaging and also provide basic infrastructures like boreholes, sorting, cracking, dehuller and milling machines for both the fruits and seeds processors.

Keywords: Gender Analysis, *Parkia biglobosa*, *Vitelleria paradoxa,* Value chain, Derived savanna.

INTRODUCTION

The ways men and women value, access and use forests, trees and their products have long been recognized as different (Watson, 2005). This 'gendered' nature of rights to resource and market use and access is due to the different and unequal rights and power relationships between men and women in most societies (Ingram, 2014). Value chain analysis is a valuable tool for assessing and comparing the degree of participation of various actors in Non-Timber Forest Products (NTFPs) development activities, according to social factors such as gender. Value chain research demonstrates that significant differences exist in men's and women's chain participation (Haverhals *et al.,* 2014). Quang and Anh (2006) statistically examined the dependency of forest dwellers on NTFPs and the relation between household characteristics and cash income generated by NTFPs collection. Several million households worldwide depend heavily on NTFPs for subsistence or income. Research showed that rural people in the Northern part of Nigeria depend largely on fuel-wood and charcoal as a dominant biomass energy sources and also aware of mitigating methods (Orifah *et al.*, 2018; Ilu *et al.*, 2020). Women from poor households generally rely on them most for household use and income. However, men tend to cultivate NTFPs than women because they own land while women rely on collection from the field.

Forestry in many cultures is still seen as a gender blind sector due to its traditionally male-dominant area (Gurung, 2002; Watson, 2005 and Lyren, 2006). Gender has been incorporated in forestry research for the two main purposes of efficiency and equity. Previous research has suggested that while the specific roles and responsibilities of men and women vary across regions and cultures, they often follow similar broad gender divisions of labour (Bechtel, 2010; Mai *et al.,* 2011). Men are typically reported to manage and use natural resources for cash-crop based agriculture, hunting, logging, construction, and the harvest of a smaller portfolio high value forest products for sale (Cavendish, 2000; Shackleton and Cousins, 2011). In contrast, women are said to focus more on subsistence agriculture and to be primarily responsible for collecting wild resources for household use, with a particular focus on those products that contribute to immediate household-level food security (Cavendish, 2000). However, despite the gender differentiation in the management and utilization of forest resources, research has also documented how in certain instances men and women work jointly or in complementary ways (Behrendt, 2006). Previous research has highlighted two additional points in the analysis of the relations between the different genders and natural resources. First, in most culture use and access rights to natural resources, including land, trees, water, and animal protein are often differentiated along gender lines. In many societies, women have fewer ownership rights than men (Coulilaym *et al.,* 2009; Agarwal, 2010). This research focused on the study of gender analysis of all stages of production of *Parkia biglobosa* and *Vitelleria paradoxa* value chains in derived savannah zone of Nigeria

MATERIALS AND METHOD

Study Area

The study was carried out in Oyo State, Nigeria. The State is located in the South-West geopolitical zone of Nigeria. The regions are mainly inhabited by the Yorubas ethnic who are primarily agrarian but have a predilection for living in high-density urban centres. Oyo State has an equatorial climate with dry and wet seasons and relatively high humidity. The average annual temperature is 25.9 °C |and 78.5 °F in Ibadan. About 1467 mm and 57.8 inch of precipitation falls annually Ibadan lies on a coordinates of 7024'7.0632" N and 3055'2.3262"E. It has a total land area of 28,454 square kilometres. It has a population of 1.4 million (Salami *et al,* 2020). The climate favours the cultivation of crops like Maize, Yam, Cassava, Millet, Rice, Plantain, Cocoa tree, Palm tree and Cashew (Salami *et al.,* 2016; Salami, 2017).

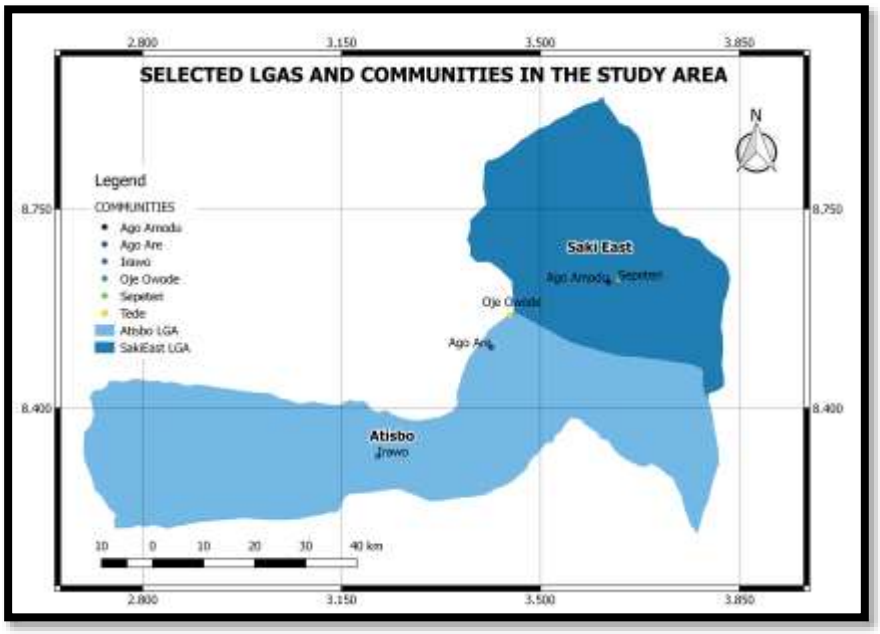

Figure 1: Map of Oyo State showing comminities in the study area.
Source: Field Survey, (2018)

METHODS OF DATA COLLECTION

A semi-structured questionnaire was developed to obtain information from one hundred and twenty (120) respondents which was administered through personal interviews due to high illiteracy rate in the rural areas. Oyo State consists of thirty-three (33) Local Governments; two Local Governments were purposively selected namely: Atisbo and Saki East Local Government. Three communities were also purposively selected in each local government based on the presence of resources and its abundance. Twenty (20) questionnaires were administered (10 male respondents and 10 female respondents) in each community purposively based on gender and their involvement in production stages. A total of one hundred and twenty (120) semi-structured questionnaires were used.

Data Analysis

Data were processed and analysed using Statistical Package for the Social Science (SPSS). Demographic characteristic distribution data from the respondents such as age education level, house hold size gender were analysed using descriptive statistic

RESULTS

Demographic Characteristics of Respondents in the Study Areas

The results of the demographic characteristics of the respondents were shown in Table 1. The results showed the distinctions among gender, ethnicity, religion, and educational levels of the respondents across the study area. 2 LGAs, 3 communities were assessed in the study area. 50% were female and 50% were male for both species. Age of the respondents above 60 years old were 56.7% , 51-60 years old were 31.7%, 41-50 years old were 3.37, 31-40 years old were 5%, 21-30 years old at 3.3% for Parkia processing respondents and the age of the respondents for Vitellaria processors above 60 years old at 5.0 % , 51-60 years old at 36.7%, 41-50 years old were 3.37%, 31-40 years old were 3.3%, 21-30 years old were 3.3%.

The educational levels of the respondents for Parkia processing showed that 53.3 % had no formal education, 28.3 % had primary education, 15.0 % had secondary education, and 3.3 % had tertiary education. For Vitellaria processors, 46.7% had no formal education, 28.3% had primary education, 21.7% have secondary education, and 3.3% had tertiary education.

Majority of the respondents for Parkia processors were (60.0 %) Christians, (38.3 %) Muslims and (1.7%) traditionalists for both species. The household size of 2-4 had 21.7%, 5-9 had 71.7% while above 10 had 6.7% for Parkia processors, while household size of 5-9 had 68.3%, 2-4 had 30.0%, and above 10 had 1.7% for Vitellaria processors.

The primary occupation for Parkia processing respondents were (1.7%) civil service, (55.0%) farming, (36.7%) trading and (6.7%) others, while for Vitellaria processors, (50.0%), farming, (33.3%) trading and (16.7%) others

(48.3 %) were immigrants and (51.7 %) were native for Parkia and Vitellaria processors of the respective communities in the study area. (71.7 %) respondents got additional income from other sources and (28.3%) respondents did not have other sources of income for Parkia processors, while for Vitellaria processors (71.7 %) as other sources that provides additional income apart from their primary occupation where (28.3 %) did not have other sources of income. The estimated income per month for Parkia processors were as follows: less than 10,000 (3.3%), 10,000 - 19,999 (11.7%), between 20,000 - 29,999 at (40.0%), between 30,000 - 39,999 at (26.7%) and between 40,000 - 49,999 at (18.3%). For Vitellaria processors, less than ₦10,000 (8.3%), between ₦10,000 - ₦19,999 (16.7%), between ₦20,000 - ₦29,999 (31.7%), between ₦30,000 - ₦39,999 (25.0%) and income between ₦40,000 - 49,999 (16.7%).

Years of Experience of respondents for Parkia processors showed that (1.7 %) had less than 5 years of experience, 5–10 years (18.3%) and above 10 years (80.0%) while for Vitellaria processors, 75.0% was above 10years, 1.7% was less than 5 years, and 23.3% of the respondents were in the range of 5–10 years of experience.

Table 1: Demographic and Socio-Cultural Characteristics

Variables	Categories	Parkia		Vitellaria	
		Freq	%	Freq	%
Gender	Male	30	50	30	50
	Female	30	50	30	50
Age	21-30 years	2	3.3	2	3.3
	31-40 years	3	5.0	2	3.3
	41-50 years	2	3.3	2	3.3
	51-60 years	19	31.7	22	36.7
	>60 years	34	56.7	32	53.3
Educational Status	No Formal Education	32	53.3	28	46.7
	Primary Education	17	28.3	17	28.3
	Secondary Education	9	15.0	13	21.7
	Tertiary Education	2	3.3	2	3.3
Religion	Christianity	36	60.0	32	53.3
	Islam	23	38.3	27	45
	Traditional	1	1.7	1	1.7
Marital Status		1	1.7	1	1.7
	Married	51	85.0	52	86.7
	Widowed	5	8.3	6	10
	Divorced	3	5.0	1	1.7
Household Size	02-04	13	21.7	18	30
	05-09	43	71.7	41	68.3
	Above 10	4	6.7	1	1.7
Nativity	Native	31	51.7	31	51.7
	Immigrant	29	48.3	29	48.3
Primary Occupation	Civil Service	1	1.7	30	50
	Farming	33	55.0	20	33.3
	Trading	22	36.7	10	16.7
	Others	4	6.7	43	71.7
Additional Income	Yes	43	71.7	17	28.3
	No	17	28.3	5	8.3
Estimated Income Per Month (N)	Less than 10,000	2	3.3	10	16.7
	10,000 - 19,999	7	11.7	19	31.7
	20,000 - 29,999	24	40.0	15	25
	30,000 - 39,999	16	26.7	10	16.7
	40,000 - 49,999	11	18.3	1	1.7
Years of Experience		1	1.7	1	1.7
	5–10	11	18.3	14	23.3

≥10	48	80.0	45	75

Source: Field Survey, (2018)

Seeds Collection

Different sources of seed collection for *Vitellaria paradoxa* revealed that (48.3%) were got from the Farms, (5.0%) were from farm, (21.7%) were from Home gardens, farms and Community forest, (1.7%) were from farm and community forest and (23.3%) were from community (Figure 1).

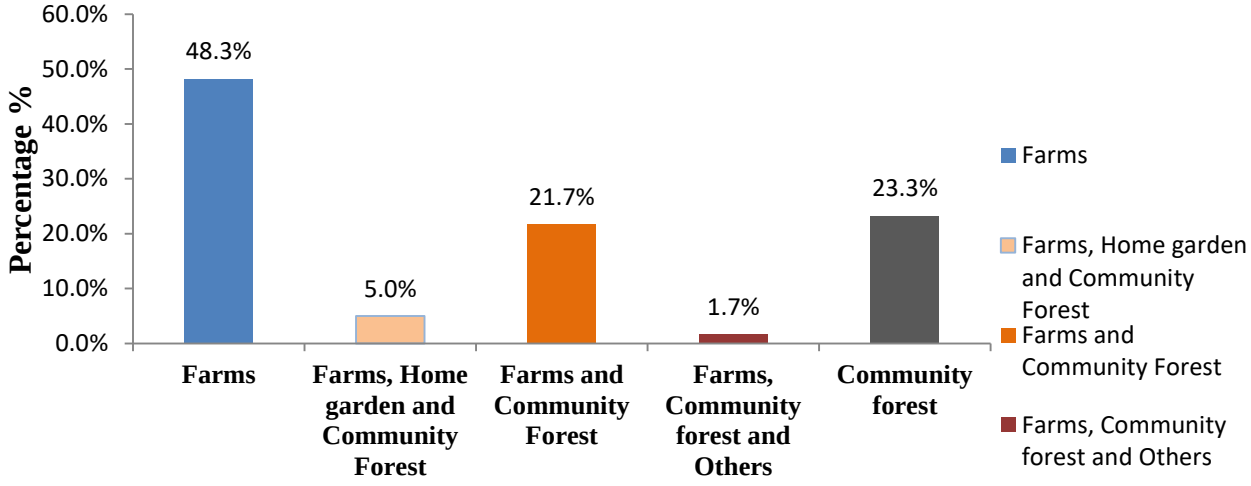

Figure 1: Sources of seed collection for *Vitellaria paradoxa*

Other sources of *Parkia biglobosa* seed collection for production by respondents were presented. (41.7%) seeds were collected from farms, (1.7%) from farms and home garden, (5%) from farms, home garden and community forest, (33.3%) from farms and community forest, while (18.3%) were from community (Figure 1).

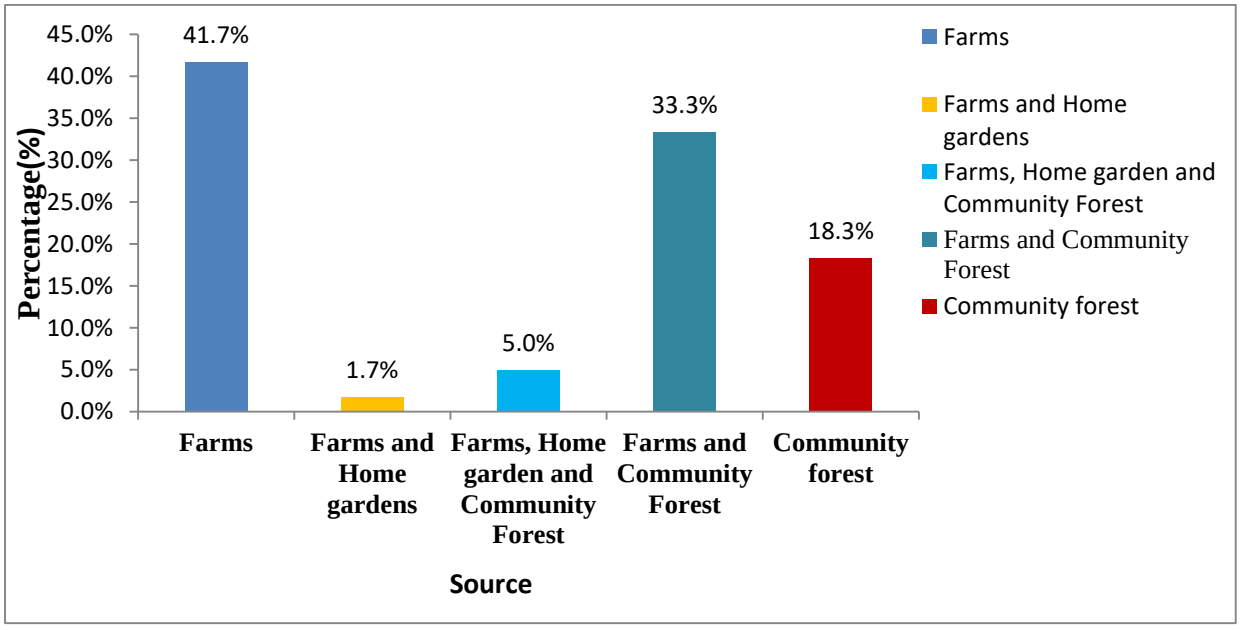

Figure 2: Seed collection for the two species

Gender participation in Production Stages

The nuts of Vitellaria were processed into Shea butter in nine (9) stages: sorting, washing and drying nuts; crushing and coarse milling; roasting; fine milling into paste, kneading and mixing with water, heating the paste and scooping off the floating oil; filtering, cooling and solidification to obtain butter.

It was discovered that gathering of ripe matured fruits are 100.0% done by both genders (men and women). Extraction of seed is carried out 80.0 % by women and 20.0% by both gender

as shown in Fig 3.

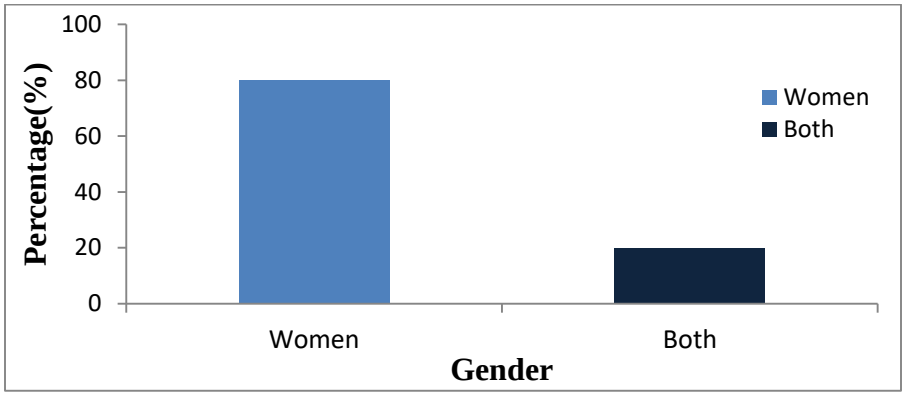

Figure 3: Extraction for the two species

Washing of kernels was done mostly by women (99%). Drying of washed seeds is done 100.0% by women. Crushing was carried out 16.7% by men, 83.4% by women shown in Figure 4

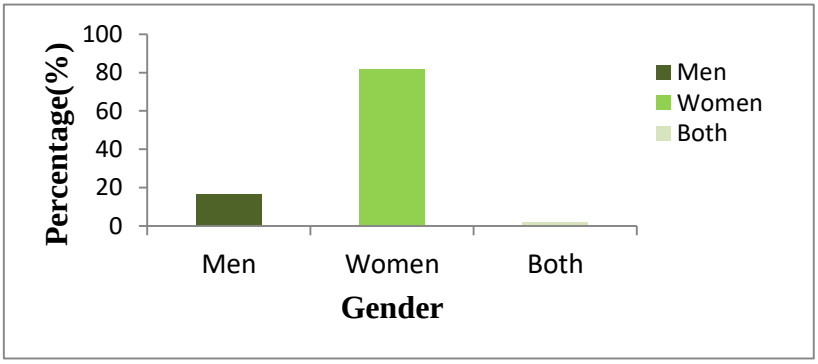

Figure 4: Crushing for the two species

Roasting was carried out by 83.4% by women, 16.7% by men shown in Figure 5.

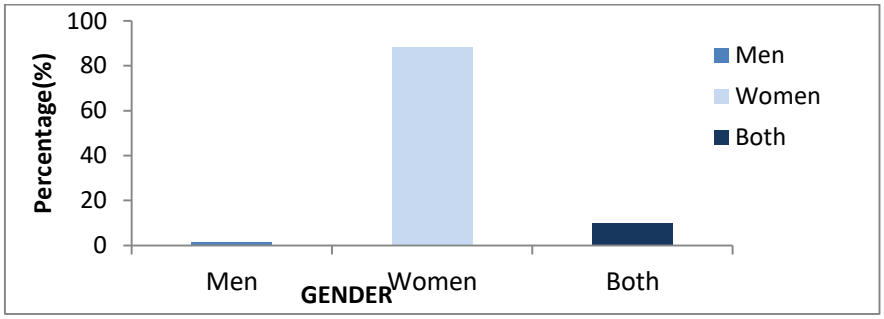

Figure 5: Roasting for the two species

Milling was carried out by 81.7% by women, 11.7% by men and 6.7% by both gender as shown in Figure 6

Figure 6: Milling for the two species

Kneading was carried out by 91.7% by women, 8.3% by men as shown in Figure 7. Heating of crude butter is carried out by 100.0% by women. Purification was carried out by 100.0% by women.

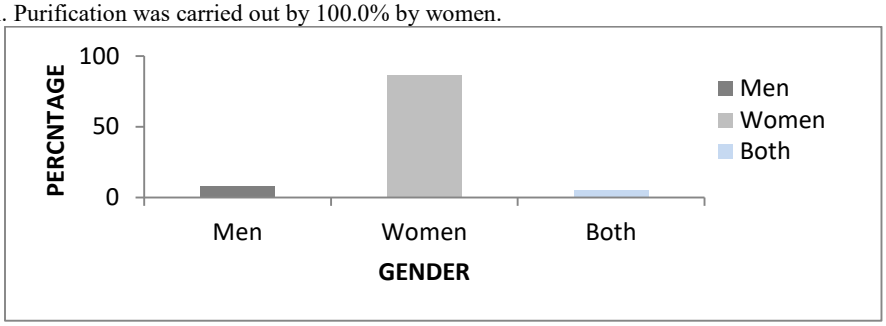

Figure 7: Kneading for the two species

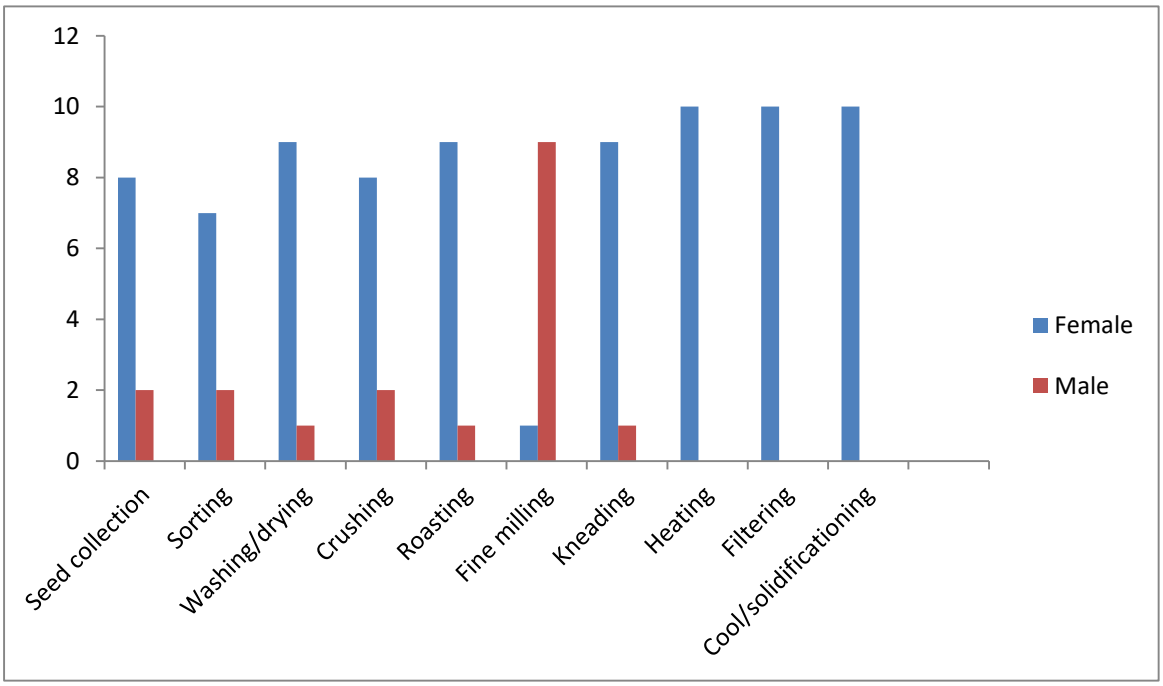

Figure 8: Summary activities on *Vitellaria spp*

The above figure shows the summary processing stages of *Vitellaria spp* on gender bases was shown above

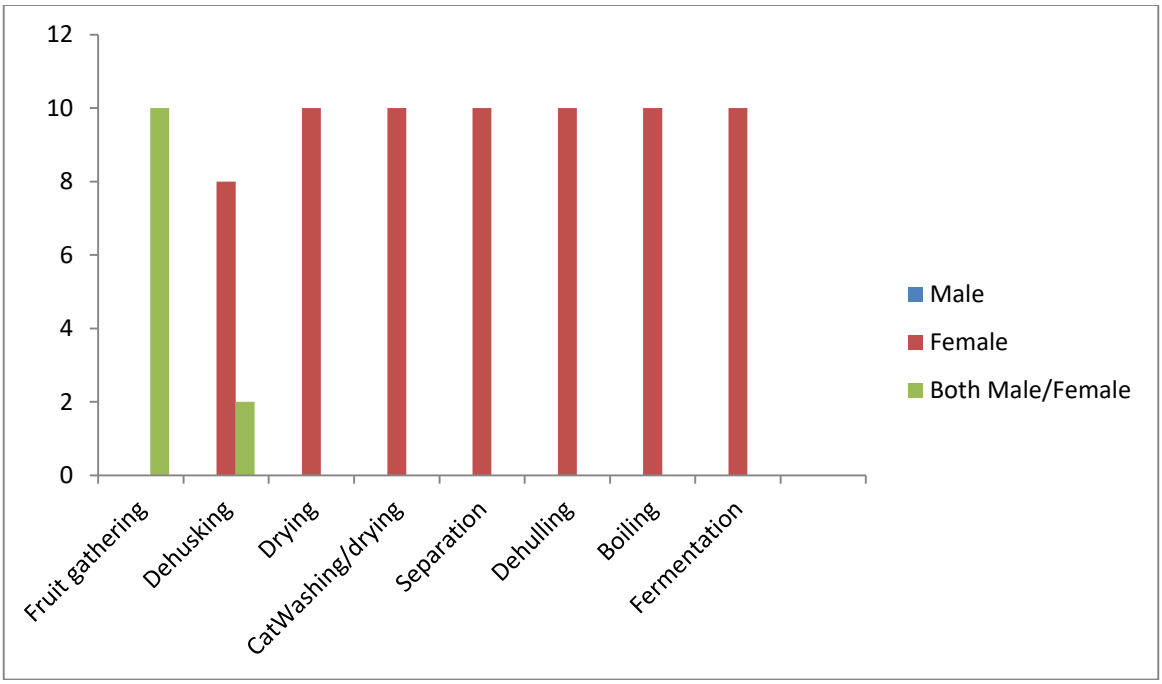

Figure: 9 Summary activities on *Parkia biglobosa*

The above figure shows the summarized processing activities of *Parkia biglobosa*. In which women partake more than the male counterpart in the processing. For Parkia, survey analysis depicts that gathering of ripe matured fruits were harvested 100.0% by both gender (Men and Women). Dehusking and seed removal is carried out 100.0% by women. Drying was carried out 100.0% by women. Seeds were washed and dried in the sun for proper storage in sacks, bowls and other spacious containers. Separation, dehulling and boiling were carried out 100.0% by women. Fermentation process was carried out 100.0% by women.

DISCUSSION

Gender participation in production stages

Extraction of seed was carried out by women and by both gender. Washing of kernels were done by women (Fig 3). They sorted the seeds by bringing out all chaffs and foreign materials before washing. Improper washing will lower the quality appearance of shea butter and lower the its market prices. Therefore, washing improved the appearance and the quality of the butter, which enhances its attractiveness in the market. Drying of washed seeds was done by women.

Crushing is carried out by both gender (men and women) as shown in Figure 4. The crushing of the raw kernel is performed to obtain small sized grits for effective roasting. Roasting is carried out by both gender as shown in Figure 5. Roasting of the kernel grits was performed to facilitate easy oil extraction by spresding crushed kernels in sun for few minutes.

Milling carried out by both gender as shown in Figure 6. The milling is conducted to convert the roasted grits into paste for kneading. For producers that do not have access to machines, they pound first in small quantities using a mortar and pestle to transform it into a coarse paste. Then grind the coarse paste into a finer paste on a grinding stone. But for others, it is straight forward because they have access to an electric powered grinding mill that complete this process within short period of time.

Kneading is carried out by both gender as shown in Figure 7. The paste is rigorously and continuously stirred, while water is continuously added until butter begins to appear on top as a white fluffy substance. A kneading machine is required for this process for those who have access to it.Heating of crude butter is carried out by women. The solid white fluffy crude butter is separated and heated in a while stirring. The water evaporates and the melted solid fluff boils as oil for some time. Caution must be taken because over boiling can burn the oil, which affects the final appearance of the butter and its market value. Purification is carried out by women. The boiled oil will be decanted, impurities will be sieved off, and the oil is allowed to solidify overnight. The solidified butter will now be packaged for purchase.

For Parkia, the prevailing method of processing in the study area is manual or traditional. None of the respondents interviewed have processing machine like dehuller. Series of stages are involved in the local processing of the Parkia seeds. Survey analysis depicts that gathering of ripe matured fruits are harvested by both gender (men and women). Dehusking and seed removal is carried out by women, the fruit valves are opened with hand by removing the fibrous strand extending from the base to the apex removing the yellowish portion of the fruit. The pulp containing the seeds are washed to remove the yellowish portion of the fruit and separate the seed for further food processing which is carried out in the river, flowing stream or any source of water like well, tap etc.

Drying is carried out by women. Seeds washed and dried in the sun for proper storage in sacks, bowls and other spacious containers. Separation, dehulling and boiling is carried out by

women. The dried seeds are boiled in water in a pot for 12-14 hours to soften the seed coats. The boiled seeds are mashed by foot and woodash is added, then washed thoroughly and the sharfts and dirt are removed by using basket or perforated calabash. Large quantities of water were being used during this process. The washed beans are boiled again for 2-4 hours. Fermentation process is carried out by women. Majorly, African women have long collected, marketed and transformed Shea nuts into a multipurpose butter. The growing global trade in Shea butter destined for the Western food and cosmetics industries thus represents an opportunity to bolster impoverished female incomes (Marlene and Judith, 2007)

CONCLUSION

The study concluded that participation of *P. biglobosa* and *V. paradoxa* producers has contributed to changes in gender roles at the household level as observed in the study. Majority of the collectors and processors are women for both species. The local production of *Parkia biglobosa* is rigorous, time consuming and unhygienic. Dehulling of the locust beans is time consuming, laborious and inefficient. This study also revealed that *Vitellaria paradoxa* and *Parkia biglobosa* is very important cash tree for rural people especially the women. The production process has an important socio-economic role since it generates employment and income to a significant proportion of rural population especially women. This study recommended promotion of modern technologies for value addition of both Parkia and Vitellaria products. The traders also need to be educated and familiarized with good hygiene practices. There should be provision of innovative storage facilities for the processors to ensure abundant seed availability all-round the year.

REFERENCES

Abbiw, A. (1990). Value chain dynamics of an emerging palm fiber handicraft market in Maranhão, Brazil. *Forests, Trees and Livelihoods* 23(1-2):36-53.

Agarwal, D.U. (2010). Promotion of Standardization in Africa for Collective Good contribution to Regional International Expert Consultation on Establishment and Harmonization of Africa Regional standards for Shea butter and Shea kernel, Accra. Pp 45-55

Bechtel, (2010). Participatory exclusions, community forestry, and gender: Analysis for South Asia and a conceptual framework, *World Development*, 29(10):1623-1648.

Behrendt, C. (2006) *The Cotton Sector in Mali: Realizing its Growth* Potential. Policy Insights no. 30. Issy-les-Moulineaux, France: OECD Development Center. Pp 89-100

Booth, F.E.M. and Wickens, G.E. (1988) Non-timber uses of selected arid zone trees and shrubs in Africa. FAO Conservation Guide 19. *Food and Agriculture Organization of the United Nations*. Rome. pp 103-109.

Campbell-Platt, G. (1980). African Locust Bean (Parkia Species) and Its West African Fermented Food Product, Dawadawa. *Ecology of Food and Nutrition*. 9: 123-132

Cavendish, R. (2000). Participation in a Gendered Environment: The Case of Community Forestry in India, *Human Ecology*, 32(3):365-382.

Coulilaym, A S., Pascaline, C. L., Mulualem T., Patueem T and Jean M. O 2009: Determinant access to forest products in Burkina Faso. *ELSEVIER* 11(7):516-524

Elias, A. A. (2003). An Outline of Nigerian Vegetation, 3rd Edition, Federal Ministry of Information, Lagos. 46pp.

Gurung, D. J. (2002). Getting at the heart of the issue: Challenging male bias in Nepal's Department of Forests, *Mountain Research and Development*, 22(3):212–215.

Haverhals, M, Ingram V, Elias M, Basnett, B. (2014). Gender and forest, tree and agroforestry value chains, Evidence from literature. Availableat:http://www.cifor.org/library/5497/gender-and-forest-tree-and-agroforestry-value-chains/ [accessed 15.4.15]

Ilu, K. J., Salami, K.D., Gidado, A. H., Muhammad, Y. K. and Bello Ahmed (2020). Household's Responses to the Roles of Trees As Wind Breaker in Dutse Local Government Area of Jigawa State, Nigeria *Fudma Journal of Sciences* 4(3):162-169

Ingram, V. (2014). Win-wins in forest product value chains? How governance impacts the sustainability of livelihoods based on non-timber forest products from Cameroon [PhD thesis]. Amsterdam: University of Amsterdam; p. 361.

Keay, R. W. J. (1989). *An Outline of Nigerian Vegetation*. 3rd Edition, Federal Ministry of Information, Lagos. 46p.

Lyren, L. (2006). Gender and forestry – a bibliography. Forestry library, Faculty ofForest Scientists, Swedish University of Agriculture Sciences.

Mai, Y.H., Mwangi, E. and Wan, M. (2011) Gender analysis in forestry research: looking back and thinking ahead. *International Forestry Review*. 13 (2):245-258.

Marlene, E. and Judith, C. (2007). African Shea Butter: A Feminized Subsidy from Nature. *Africa* 77 (1): 37-62

Orifah, M. O., Ijeoma, M. C., Ehien, 1., Nasiru, A. E. and Fadairo, O. S. (2018) Awareness of the health implications of use of biomass energy sources among women in rural households of Jigawa State, Nigeria. Agricultura Tropica Et Subtropica, 51(2):93–101.

Quang, D. V., and. Anh. T. N. (2006). Commercial collection of NTFPs and households living in or near the forests: Case study in Que, Con Cuong and Ma, Tuong Duong, Nghe An, Vietnam, *Ecological Economics*, 60 (1): 65-74

Rocheleau, D, Edmunds D. (1997). Women, men and trees: gender, power and property in forest and agrarian landscapes. *World Development*, 25, 1351–1371.

Salami K. D., Akinyele, A.O., Adekola P. J and Odewale, M. A. (2016)**.** Tree species Composition and Regeneration potential of Onigambari Forest Reserve, Oyo State. *Nigeria Direct Research Journal of Agriculture and Food Scienc*e (DRJAFS). Vol.4 (3),

Pp.39-47, March 2016 ISSN 2354-4147 Article Number: DRJA25309587.

Salami, K.D. (2017): Tree species Diversity and Soil status of Omo Biosphere and Gambari Forest Reserves in South western Nigeria. Ph.D Thesis, Department of Forest Resources Management, University of Ibadan, Nigeria

Salami, K.D. and Lawal, A.A. (2018). Description of Economical Trees and Shrubs species in Northern part of Nigeria and their potentials. A proceeding of the 6th Biennial National Conference of the Forests and Forest Products Society Pp136-144.

Salami, K.D., Akinyele, A.O. and Jibo, A.U (2020): Population Density And Values Of Avenue Trees: A Case Study Of Ibadan Metropolis, Oyo State, Nigeria, *FUDMA Journal of Sciences*. 4 (1): 163 – 170

Shackleton, S., Paumgarten F, Kassa H, Husselman M, Zida M. (2011). Opportunities for enhancing poor women's socio economic empowerment in the value chains of three African non-timber forest products (NTFPs). *International Forestry Review* 13(2):136-151.

Shively, G. (1997). Challenging Perceptions about Men, Women, and Forest Product Use: *A Global Comparative Study*. World Development. Pp 56

Sina, S. and Traoré, S.A. (2002). *Parkia biglobosa* (Jacq.) R.Br. ex G.Don. Record from Protabase. Oyen, L.P.A. and Lemmens, R.H.M.J. (Editors). PROTA (Plant Resources of Tropical Africa / Resources végétales de l'Afrique tropicale), Wageningen, the Netherlands. the Royal Botanic Gardens, Kew. UK. 337p

Thiombiano, D. N., Lamien, N., Dibong, D. S., Boussim, I. J., and Belem, B. (2012). The role of woody species in managing food shortage in Burkina Faso. Sécheresse, 23(2), 86-93.

Watson, L. (2005). Gender-Sensitive Natural Resource Management (NRM) Research-for Development. DFID NRSP Programme Development Report PD 123: *Gender sensitive NRM research for development*. Cambridge, UK: Department of Geography, University of Cambridge Pp 89.

Treacy, M. M. and Higgins, J.B. (2001). Collection of Simulated XRD Powder Patterns for Zeolites, Elsevier, Amsterdam.

Wei, W., Yang, L. Zhong, W.H., Li, S.Y., Cui, J.,and Wei, Z.G. (2015). Fast removal of methylene blue from aqueous solution by adsorption onto poorly crystalline hydroxyapatite nanoparticles. Dig. *J. Nanomater. Biostruct.19*, 1343–1363.

Tchobanoglous, G. and Burton, F.L. (1991).Wastewater Engineering Treatment, Disposal and Reuse, 3rd Ed.;McGraw-Hill: New York, 318–324.

Wang, S., Boyjoo, Y. and Choueib, A. (2005). A comparative study of dye removal using fly ash modified chitosan resin with Pb (II) as template. *Carbohydrate Polymers. 81*, 305–310.

Zhiming, S., Guangyuan, Y., Jingjing, L., Xiaoyu, Z., and Shuilin, Z. (2018). One-Step Hydrothermal Synthesis of Zeolite X Powder from Natural Low-Grade Diatomite. *Materials, 11,* 906.