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

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ABSTRACT

The research examined the gender based activities on *Parkia biglobosa* and *Vitellaria paradoxa* value chains in derived savanna 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: Atisibo 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 *Vitellaria 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*, *Vitellaria 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; Ila 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 (Bechtle, 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 *Vitellaria paradoxa* value chains in derived savanna 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 7024'7.0632̎ N and 3055'2.3262̎E. 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).

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 3.3%, 31-40 years old were 3.3%, 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 10 years, 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

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>Parkia</th>
<th>%</th>
<th>Vitellaria</th>
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<td>41-50 years</td>
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<td>Others</td>
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<td>71.7</td>
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<td>28.3</td>
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<td>30,000 - 39,999</td>
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<td>26.7</td>
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<td>11</td>
<td>18.3</td>
<td>14</td>
<td>23.3</td>
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</table>
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).

![Graph showing sources of seed collection for *Vitellaria paradoxa*](image1)

**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).

![Graph showing seed collection for two species](image2)

**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](image)

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](image)

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

![Figure 5: Roasting for the two species](image)

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

The above figure shows the summary processing stages of *Vitellaria spp* on gender bases was shown above.
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 spreading 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 straightforward 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 shellots 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 vigorous, 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.

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