

Palm oil (*Elaies guinnesis*) production and livelihood strategy among rural women in Nigeria

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Abstract

The increasing level of poverty in Nigeria has forced more women to embark on numerous livelihood strategies that include palm oil production. This study aimed to investigate the social economic impact of palm oil production on women's livelihood in Akoko region, Ondo State, Nigeria. The objectives of the study were to; examine Socioeconomic characteristics of the palm oil producer, mode of palm oil production in Akoko region, determine the relationship between women socioeconomic variables and indices of palm oil production in Akoko Region, determine the impacts of palm oil production on women livelihood, and to examine the challenges of palm oil production in the study area. Data for the study were collected from primary and secondary sources. 200 women were selected across 67 palm oil production sites and were administered with copies of questionnaire using simple random sampling technique. The study employed a mix of descriptive statistics, Pearson correlation, and regression analysis for method of data analysis. Findings revealed positive relationships between level of palm oil production and the socio-economic variables of women that include, age ($r = 0.67$), marital status ($r = 0.43$), educational status ($r = 0.61$), household size ($r = 0.23$) and annual income ($r = 0.51$) at $p > 0.05$. Study revealed lack of improved seedlings, access to credit and loan facilities, processing facilities, and high cost of agro-chemicals, poor market strategy have limited palm oil production in the study area. The study concluded that palm oil production is significant to women survival in terms of income generation, but its current production dominated by 67.5% local methods could no longer sustainable. Therefore, it is recommended that adoption of modern technologies, and training of their uses and women access to credit and loan facilities will be adequate for an improved livelihood among rural women.

Keywords: living strategy, agriculture, women, rural, poverty, Akoko region

1. Introduction

Rural women have been using self-engagement for everyday maintenance as part of independent living methods in recent years. Their contributions to a country's socioeconomic development, innovation, and food security have grown as a result of this effort. Additionally, as Nigeria's poverty rate rises, more women are being compelled to pursue various livelihood methods, including production of palm oil (*Elaies guinnesis*), with the aim to increase household income and create jobs. The production of palm oil has, however, been limited to individual or collective efforts, primarily involving rural women. Aside the socioeconomic advantages of palm oil, profit sharing might also


serve as an additional motivator to draw more women to the palm oil industry (Cárdenas 2007).

In Nigeria, palm oil has an impact on many facets of life with socioeconomic and cultural values. Three commercial products can be distinguished in the processing of palm oil: palm oil, palm kernel oil, and palm kernel cake. Vitamin A and carotene are abundant in palm oil. Additionally, soaps and other detergents are made with it (Agwu, 2006). According to Ajie (2013), palm kernel oil is used to make lubricants, cooking fats, margarine, pomade, and glycerin. Kernel cake, the remnant left behind after oil is extracted, is used to make animal feed (Soyebo *et al.*, 2005). The leftover sludge from manufacturing palm oil is used to make fertilizer and conventional soap. After oil is extracted, the empty bunch, fiber, and shell that are left over can be used as fuel, manure, and mulch. Given the economic benefits of producing palm oil

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and the large number of women who work in its processing, it is crucial to take into account how these women make a living. One of the top producers of palm oil in South Western Nigeria is Ondo State, the study's location. It is clear that the majority of those participating in the State's palm oil processing are women. The rising degree of livelihood strategies among women in this region has led to a large increase in their involvement in the production of palm oil. This is especially true given that the agricultural sector accounts for about 80% of jobs in rural areas (Economic Review, 2010). People create livelihoods in order to meet their needs and make a living (Bryceson, 2002). The livelihood strategy includes, self-employment, hired work, remittances, and/or a combination of these (Gwimbi 2009; Kristjanson *et al.* 2014; Mutopo 2014; Shackleton *et al.* 2001). According to the Food and Agriculture Organization (FAO, 2011), sustainable livelihoods are those that are adequate to prevent poverty and enhance the general well-being of households and families. Personal food security is enhanced by livelihood security that involves safe access, availability, and ownership of resources, assets, and reserves to mitigate risk, meet emergencies, and reduce shocks (Gerbens-Leenes and Nonhebel 2005; Gladwin *et al.*, 2001; Hermann *et al.* 2012). Agriculture continues to be the primary employer of rural women worldwide, particularly in sub-Saharan Africa and Southern Asia (Batterbury 2008; Bryceson 2002; Davies *et al.*, 2013; Ejigu 2008; FAO *et al.*, 2010). Rural women have implemented a variety of livelihood methods to augment their agricultural revenue in an effort to attain economic empowerment. However, it is believed that variables like education and resource availability govern this diversification (FAO *et al.*, 2010; Mutopo 2014; O'Laughlin 1998; UNDAW and UNIFEM 2001). Obviously, women in developing nations still have the freedom to select a livelihood strategy that suits them, even in the face of limitations and difficulties. This has given them a sense of pride and ensured their diligence and commitment (UNDAW and UNIFEM, 2001). This freedom of choice has given women the ability to make relative decisions about what is best for their families in places like South Africa and

Pennsylvania (Oberhauser *et al.*, 2004). However, the accessibility and availability of markets, infrastructure, and religious and cultural norms that forbid women from engaging in economic activities all influence decisions. According to Oberhauser (2010), rural women employ a variety of sources of income to fulfill their obligations. For example, it was reported that women in Porto Novo were selling food since it provided a steady source of income and a way for their families to have access to food (Oberhauser *et al.*, 2004).

Many factors influence the choice of livelihoods for nations in semi-arid regions, like Zimbabwe, South Africa, and Botswana. Some of these factors are natural, like cyclones and droughts, and others that make it difficult to implement livelihood strategies (Campbell *et al.*, 2002; Ellis 2000; Frost *et al.*, 2007). Rural communities learn coping mechanisms in these circumstances, and their capacity to handle shocks leads to community empowerment (Kabeer and Natali, 2013). Resilient communities employ risk management strategies that facilitate change and advance sustainable development. In terms of geographical characteristics, the majority of individuals living in rural areas are elderly, married, divorced, or single, and their main goals are to improve their level of life, raise their yearly income, and increase their access to food. The ability to support oneself or one's family is viewed as a daily struggle for self-sufficiency among rural residents in an effort to lower the dependency ratio. One of the regular activities of women in the rural districts of Ondo State, Nigeria, is the production of palm oil. Women benefit from the products like palm oil, palm kernels, and brooms made from palm trees, which provide them with resources for daily living. However, the percentage of rural women living in poverty is rising. For rural women to be self-sufficient against hunger and to meet their social requirements, more Resilient Social Protection Systems (RSPS) may need to be developed in light of the current economic crisis (ILO, 2020). In order to generate employment and improve household income, women in rural settings usually embark on numerous livelihood strategies that include pottery, gardening, poultry farming, community-driven irrigation farming, sewing and

credit clubs. However, the livelihoods among rural women are not sustainable due to the lack of financial, physical and human capital, lack of social, natural capital and household assets that enable viable livelihood execution. In Akoko Region of Ondo State in Nigeria for instance, palm oil production has been at the capacity of personal or group efforts, where rural women in the area engage in for the purpose of daily earnings and upkeep. This study focused on assessing the impacts of palm oil production on the livelihood of women in Akoko region of Ondo State, Nigeria. The study objectives were to; examine Socioeconomic characteristics of the palm oil producer, mode of palm oil production in Akoko region, determine the relationship between women socioeconomic variables and indices of palm oil production in Akoko Region, determine the impacts of palm oil production on women livelihood, and to examine the challenges of palm

oil production in the study area. The study further provided guidance on how this livelihood strategy has or can enhance rural women's sustainable living in relation to the Sustainable Development Goals (SDGs) and the creation of Resilient Social Protection Systems (RSPS) (Davies *et.al.*, 2013).

2. Materials and Methods

2.1 Study Area

This study was carried out in Akoko region of Ondo State, the region is made up of four local government councils, Akoko North West, Akoko North East, Akoko South West and Akoko South East local government areas of Ondo State. As shown in Figures 1 and 2, the study area is located between the geographical coordinate of Latitude $7^{\circ}13'$ and $7^{\circ}15'$ North of the equator and longitude $5^{\circ}10'$ and $5^{\circ}12'$ East of the Greenwich Meridian (Aminu, Ajayi and Adelabu, 2014).

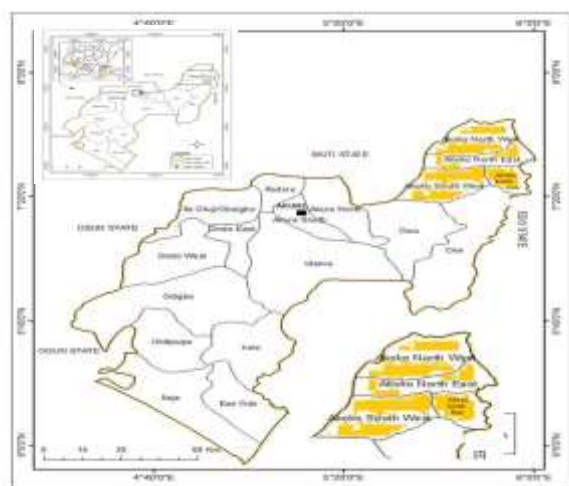


Figure 1. Ondo State (Inset: Nigeria showing Ondo State)

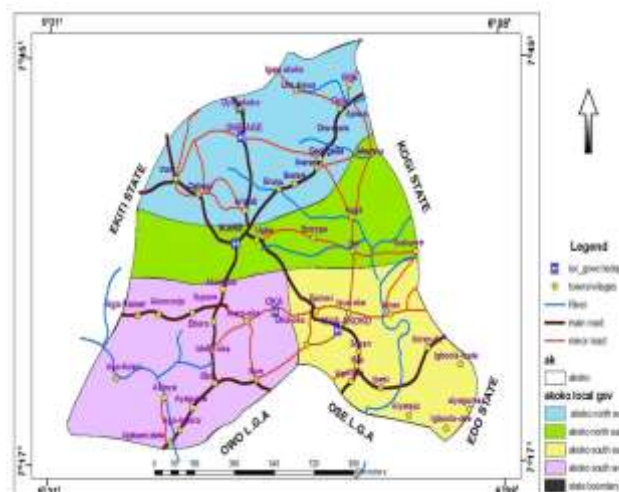


Figure 2. Akoko Region.

Akoko Region is characterized by abundant rainfall with tropical pattern of climate (Oyakale, *et. al.*, 2009 and Ogunbodede, *et al.*, 2010). The rainy season normally commenced from April to October with double maxima rainfall and slight dry season between November and March. Ondo State characterized by highly laterized, sand/laterized and dark loamy soils. However, the relatively high topographic effect which produces on the plateau settlement gives better weather

conditions than those on the surrounding lowlands, Akoko has a mean annual temperature of 21°C - 32°C (Aminu, Ajayi and Adelabu, 2014) with annual rainfall of about 1,270mm, and humidity is relatively high for a good part of the year. The economy of the study area is majorly attributed to agriculture and trading. The dominant economic activities within the State is mainly agriculture but predominantly of cocoa and palm fruit as cash crops. The inhabitants

engaged predominantly in primary activities such as farming and trading. Precisely, a larger percentage of the people engaged in farming as their major occupation, while few engaged in other activities like trading. Other economic activities in the area include trading and handcrafting such as weaving carpentry dyeing and pottery.

2.2. Methods

Data for the study were collected using both primary and secondary sources. Questionnaires were developed and used to investigate the socio-economic variables such as age, marital status, level of education, household size, and annual income of women. The population for the study comprises of all women in the study area. However, sample frame involved women within the population of 134 Palm Oil Production Sites (POPSs) identified during the reconnaissance survey by the researcher. Multi-stage sampling techniques that included proportionate sampling was employed to select 67(50%) POPSs from the 134 POPSs for the study. Simple random sampling was used to select 3 respondents each from the 67

POPSs. In all, two hundred (200) respondents were selected and administered with copies of questionnaire. Data were analyzed using simple frequencies and percentages, Pearson product moment correlation and regression analysis.

3. Results and Discussion

3.1 Socioeconomic Characteristics of the Respondents

Age classification indicated 13% of respondents who fell on age bracket of 18 to 29 years, 26% respondents were ranged between 30 and 39 years, 52% were of 40 and 49 years age bracket, while respondents on 50 years of age and above fell on 9%. Among all the categories of age distributions, ages 40 to 49 years were rated high. This age bracket further reflected a prevalent productive age by which women could engage their youthful strength for more production of palm oil (Table 1). It is generally believed that this age structure is reliably dependent on palm oil production being the major source of personal income to meet family needs.

Table 1. Socioeconomic characteristics of the respondentsA

Age Distribution			Marital Status			Educational Status		
Year	freq	%	Status	freq	%	Status	freq	%
20-30	26	13	Single	34	17.5	No Formal Education	8	4
31-40	52	26	Married	93	46.5	Primary School	16	8
41-50	104	52	Divorce	18	9	Secondary School	136	68
<50	18	9	Widow	55	27.5	Tertiary	40	20
Total	200	100		120	100		200	100
Household Size			Income					
Members	freq	%	Income			Freq	(%)	
1-5	60	30	N100,000 -150,000			15	7.5	
6-10	30	15	N151,000 - 200,000			50	25	
11-15	110	55	N201,000 - 250,000			45	22.5	
			>N250,000			9	45	
Total	200	100				200	100	

This finding is in agreement with the the previous study of Duncan and Duncan (1955), who argued that more of young women between 40-49 years were needed in palm oil production. He posits that

most women who engaged in palm oil production were old with a mean age of 53years. It was recorded in Table 1, that 17.5% respondents were single women, 46.5% were married, 9% were

divorced and women on widows status were 27.5%. The highest percentage of 46.5 indicates that women are dependent on palm oil production not for personal needs only but also to cater for the needs of family members. The educational qualification of the respondents as indicated in Table 1 presented 4% of the respondents with no formal education, 8% had primary school education, 68% were secondary school leavers and 20% had access to tertiary education. This implies that majority of the respondents had formal education at secondary school level. This finding disagreed with Iwala (2014) who showed that the majority of the palm oil producers are mostly without formal education. This educational level is above basic and capable of enhancing women reasoning towards innovative mindset in their daily engagement. It was also revealed that 30% of the respondents had family size of 1-5, 55% had 6-10 family members, while 15% had 11-15 family members. This implies that majority of the respondents (55%) had large number of family size that ranged from 6-10 members. This finding is in accordance with the findings of Olagunji, (2007) who argued that the average household size of palm oil producer was eight persons and their survival relies on palm oil production. It was

further presented that 7.5% of the respondents earn between ₦100,000 and 150,000 on annual basis, 25% earns between ₦151,000 and 200,000, 22.5% earns between ₦201,000 and 250,000, while 45% of the respondents earns above ₦250,000 annually. The 45% high income accrued to women serves as an impetus for more commitment in palm oil production.

3.2. Relationship between women socioeconomic variables and indices of palm oil production in Akoko Region

Correlation analysis examined existing relationship between women socioeconomic variables (improved seedlings, credit facilities, transport access, season weather variation, modern technology, and age, marital status, educational status, household size and annual income. It was revealed in Table 2 that 9 variables had strong and positive relationships. These include modern technology and improved seedlings by $r(200) = 0.58$, access to credit facilities and modern technology, and educational status by $r(200) = 0.71$, and 0.61 respectively. transport access and annual income by $r(200) = 0.51$, age and modern technology by $r(200) = 0.67$, modern technology and educational status by $r(200) = 0.73$, @ $p > 0.05$.

Table 2. Correlation matrix of socioeconomic variables and factors of palm oil production

Variables	1	2	3	4	5	6	7	8	9	10
Improved seedlings	1									
Access to credit facilities	0.08	1								
Transport access	0.13	-0.24	1							
Season weather variation	0.01	0.32	0.09	1						
Modern technology	0.58*	0.71*	-0.02	0.01	1					
Age	0.04	0.07	0.14	0.05	0.67*	1				
Marital Status	0.19	0.21	0.43	0.03	0.11	0.41	1			
Educational Status	0.03	0.61*	0.03	0.19	0.73*	0.36	0.17	1		
Household Size	0.23	0.10	0.37	0.07	0.06	0.41	0.02	0.15	1	
Annual income	0.31	0.39	0.51*	0.17	0.18	0.27	0.63*	0.65*	0.71*	1

*Correlation is significant at 0.05 level

The study established significant interrelationship among modern technology and improved seedlings, access to credit facilities and modern technology, and educational status, transport access and annual income, age and modern technology, modern technology and educational status, which imply that improved socio-economic variables is capable of significant improved palm oil production in the study area. However, the study

showed negative relationships on access to transport, modern technology and access to credit facilities for production process in the study area.

3.3 Mode of palm oil production in Akoko region

This study has discussed women involvement in palm oil production in two categories. This includes, mode and level of women involvement in palm oil production. As observed in Figure 3, only

37.5% women are engaged in mechanized palm oil

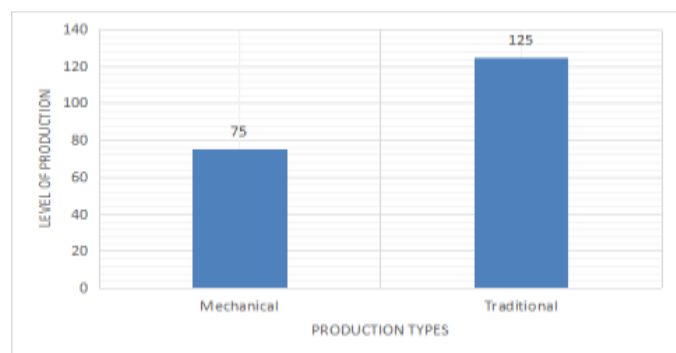


Figure 3. Mode of palm oil production

However, 62.5% traditional means of palm oil production in the study area was recorded. In Figure 4, 45.5% of the respondents engaged in palm oil production for subsistence purposes, while 54.5% women were engaged in palm oil production at commercial level. These findings explained the need for improved strategy in production by palm oil producers at significant commercial purposes. According to Centre for Tropical Agriculture (CTA, 2000), modern method of palm oil involves the use of such pressing machine that helps in the processing of Fresh Fruit Bunch (FFB) into palm oil.

Table 3. Summary of regression analysis

Co-variables	Unstandardized Coefficients		Beta	T	Sig.
	B	Std. Error			
Constant	1.950	0.181		10.821	0.000
Impact on the livelihood	8.233	0.123	0.351	6.021	0.001
Women Level of involvement	2.219	1.820	0.250	2.567	0.000

a. Predictors: (constant) Significant at 0.05 level (2-tailed)

The result of the regression analysis indicated a significant difference in the level of women involvement in palm oil production and women livelihood in the study area. This is because P-value of the covariates number for impact on the livelihood and mode of palm oil production was statistically significant at 5% level of significance with $P=0.001$, since P-value is less than 0.05. This study established notable differences in the level of women involvement in palm oil production and the impact this has on the livelihood of women in the

production method in the study area.

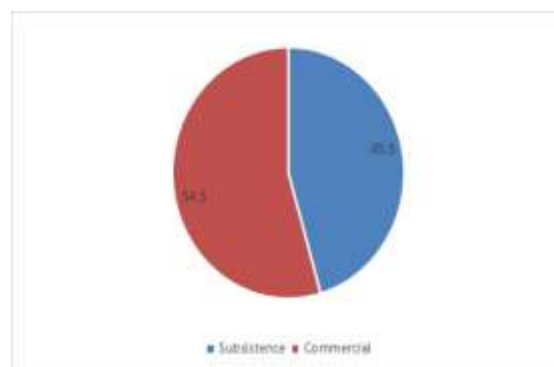


Figure 4. Level of palm oil production

3.4. Impact of mode of palm oil production on women livelihood

Regression analysis was used to determine the impact of palm oil production methods on women livelihood in the study area. The dependent variables for the study include, standard of living, annual income, food security, reduction in women dependency ratio; while independent variable involved level of women involvement in palm oil production (mechanical and traditional modes).

study area. For instance, it was understood that more women rely on daily, weekly and monthly earnings from palm oil production than its personal consumption and this is based on their production capacity in terms of traditional and mechanical involvement. The current study is in tandem with Rist *et al.*, (2010), who noted that the level of investment in palm oil production determines the level of earning, which in return has impacted on the livelihood of the women who are palm oil producers. The study equally observed that 65.5%

of the respondents agreed that there were positive impacts of palm oil production on women in terms of improved living conditions. This was reflected on improved level of women income with positive response from 74.0% of the respondents. Another impact of women involvement in palm oil production was observed through improved food

security among the residents of the study area. In addition, 55% of the respondents was of the opinion that involvement of young women in palm oil production in the study area has equally reduced women related crime rate in the study area.

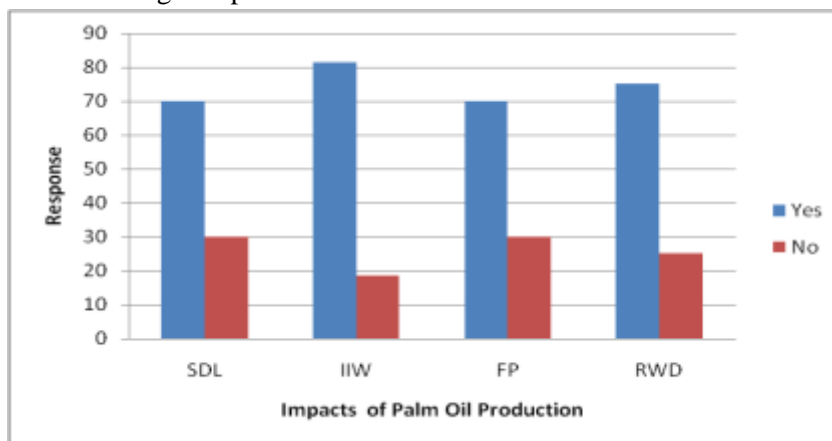


Figure 5. Impacts of palm oil production on women livelihood in Akoko region

SDL: Standard of Living; IIW: Increased Income among Women; FP: Food Provision; RWD: Reduction of Women Dependencies

3.5 Challenges of palm oil production in the study area

Figure 6 presented six factors that include, lack of improved seedlings, lack of access to credit and loan facilities, lack of processing facilities, high cost of agro-chemicals, and poor market strategy that affect palm oil production in the study area. Among the factors associated with low palm oil production, lack of access to loan facilities has

been the leading factor with 82% response. In his related study, Omereji (2005) noted that most rural palm oil processors are usually seen to be reluctant to adopt modern production techniques. Their reluctance could be associated with early adoption of traditional palm oil production method, which limits improved production strategy.

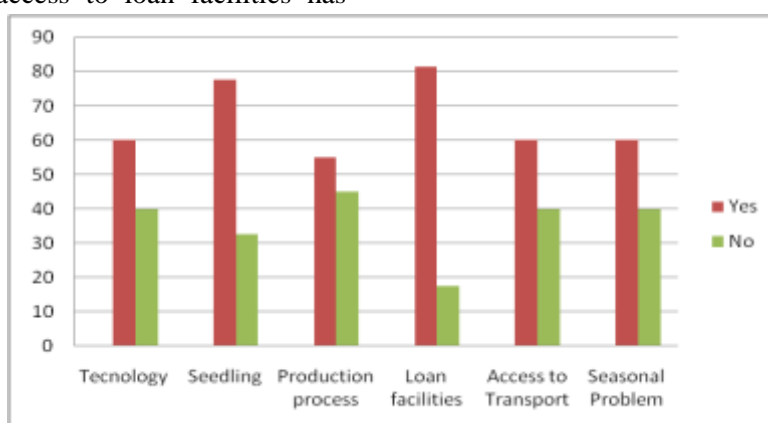


Figure 6 : Challenges on palm oil production among women region.

4. conclusions

Based on the findings, it was understood that more women rely on daily, weekly and monthly earnings from palm oil production based on their production capacity. The study concluded that palm oil production in Akoko region of Ondo State is significant to women survival in terms of income generation. However, the current traditional production method could no longer support the livelihood strategies for an improved household survival. It is therefore recommended that adoption of improved technology, training of women and communication of new practices through agricultural extension workers should be encouraged.

Declarations

Authors' Contributions

All authors are contributed in this research

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Institutional Review Board Statement

All Institutional Review Board Statements are confirmed and approved

Data Availability Statement

Data presented in this study are available on fair request from the respective author

Ethics Approval and Consent to Participate

Not applicable

Consent for Publication

Not applicable

Conflicts of Interest

The authors disclosed no conflict of interest

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