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Women utilisation of forest resources and its influence on climate change in selected forest reserves in Osun State, Nigeria

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ABSTRACT

Women dependence on forest resources as their major source of energy especially in the developing nations has environmental consequences. Thus, a research was conducted to assess the environmental effects of women utilisation of forest resources in 5 Forest Reserves (FR) in Osun State, Nigeria. The data was generated through the administration of 500 questionnaires across five settlements within each FR. Analysis was carried out using descriptive statistics. The results showed that about 90% of the women depend solely on firewood as their source of energy while more of live branches in the forest were collected (19%) than dry woods.

The study further revealed that most women (84%) in the study areas were not aware of climate change scenario and so were not concerned about replanting the trees. All the findings were corroborated by the results of the in-depth interview. The implications of the findings are that more of forest resources were exploited and without replacement, the scenario which result into environmental degradation. Other sources of energy such as cooking gas, kerosene need to be made affordable and accessible to the rural women. Further studies may consider the attitude of rural women to other sources of energy.

Keywords: Women, Forest Resources, Utilisation, Indiscriminate logging, Climate Change

1. INTRODUCTION

Forests are the most social and economic valuable ecosystems of the world in which many people source for livelihood (Omosuyi, 2015). According to Food and Agriculture Organization (FAO) (2011), forests did not only serve as a source of livelihood for rural households but also for those in the urban areas which provide a wide range of essential goods such as wood, food, fodder, medicines, recreation, spiritual renewal and other services.

In addition, forests contain roughly 90% of the world terrestrial biodiversity and are central to human life (World Wide Fund, 2010). World Bank (2002) further revealed that forest resources directly contribute to the livelihoods of 90 percent of the 1.2 billion people living in extreme poverty and indirectly support the natural environment that nourishes agriculture and the food supplies of almost half of the population of the developing world.

The New Partnership for Africa's Development (2010) had noted that Africa is well endowed with large tropical forests with the potential to meet socio-cultural, economic and ecological needs of its population that it contributed 6% to the gross domestic product, which was found to be the highest in the world. It was on this premise that Ifegbesan (2016) observed that more than 90% of rural African households depend solely on wood for fuel, including charcoal, for their energy requirements therefore they have one thing or the other to do in the forest at any time. Furthermore, FAO (1990) stated that the total hectares of arable land in Africa is estimated to be 220 million hectares and 117 million hectares of this land are cultivated, leaving 48 % fallow. Presently, 14 -16 million hectares of tropical forests are converted to agricultural land use through farming (Ogboi, 2011). According to Aigbe *et al.,* (2010), the level of deterioration of forest resources could be linked to over use of land for agriculture, grazing, industrialization and urbanization.

Nigeria, in the observation of Aigbe *et al.,* (2012), is the largest wood producer in Africa with an annual harvest estimate which is more than 100 million cubic meters. However, in view of the increase in the size of the world population and the consequent tremendous rise in the demand for living space, food and energy there had been pressure on the forest resources that about 90% of the total annual wood products serve as fuel wood, and of which 60% is used for household consumption (Fakayode *et al.,* 2013). According to Abah (2011) and Aigbe *et al.,* (2012), 55.7% of Nigerians forests have been lost at annual rate of 3.5% due to encroachments, excisions and outright de-reservations and that the larger parts of some forest reserves in south western Nigeria as discovered by Asifat (2018) have been turned to farm settlements. In a study carried out in south western Nigeria by Fakayode *et al.*, (2013) it was discovered that the households that are poor tend to be disposed to the use of forest resources fuels such as firewood and charcoal for either domestic or commercial cooking. Furthermore, people's dependency on fuel wood as primary source of energy is on the increase in developing countries, like Nigeria due to rapid population growth, hike in price of kerosene and natural gas and the erratic nature of electricity (Asifat, 2012) which, however aggravates deforestation problems in the country which are more pronounced in the forest areas of eastern and western Nigeria (Orimoogunje, 2011; Adediji *et al.,* 2012; Ekanade and Orimoogunje (2012) and Orimoogunje (2014) and Asifat (2018). This was supported by Agagu (2009) that, 76% of Nigerian populace used fuel wood (i.e. firewood and charcoal) as the main source of fuel for cooking. This was corroborated by Asifat (2012) and Orimoogunje *et al.,* (2015), in a study in south-western Nigeria that 61.2% of women sampled used firewood as the major source of domestic energy. It was further discovered in that study that, 24.8% used kerosene as the alternative source of energy to firewood, 4.8% sawdust, 59.2% charcoal, 1.2% Gas and 3.2% electricity.

Women worldwide constitute about 75% forest users due to their roles as carers and those who cook for the family and so, endowed with the knowledge of the status of forest products (Coulibaly- Lingani *et al., (*2011). In a study conducted in Kogi State by Shuaibuin 2015, it was discovered that rural women make livelihood from the collection and sales of forest products such as vegetables, fruits, soup condiments, staking materials, fodder, fuel wood, medicinal herbs, products for sponge, basket weaving, brooms, and rattans. In the same vein, Eneji (2015), observed that, women from Cross River State typically gather non-timber forest products such as *Afang*, hot leaf, *otasi*, pepper, bitter kola, bush mango, wood for fuel, fencing and food for the family use, fodder for livestock and raw materials for natural medicines among others. Such anthropogenic activities caused by women had contributed immensely to the incidence of global warming, the activities that are more pronounced in the forest belts of the world.

This scenario of forest destruction has been linked to economic decline of forest communities (Aderopo, 2013) and the responsibilities of women gender as home caretakers. According to Intergovernmental Panel on Climate Change (2007) deforestation, mainly in tropical areas, could account for up to one-third of total anthropogenic carbon dioxide emissions. Thus, this investigation aims at assessing the contributions of women to climate change in Osun state, Nigeria. The study aims at achieving the following objectives: (1) To examine the preferred forest resources being exploited by women in the study area, (2)To examine the level women understanding of climate change (3) women contribution to forest resources enhancement and(4) to examine the implication of women use of forest resources on the environment of the study area.

2. MATERIAL AND METHODS

Study Area

The forest reserves in Osun State form the focus of this study. Osun State has 30 Local Government Areas (LGAs) plus an area office. It is located between latitudes 6º 40′ and 8 º 10′ North and longitudes 4º 05′E and 5º 02′ East. The state covers an area approximately 8,602 square kilometres. It is bounded in the west by Oyo State, in the East by Ondo State, in the North by Kwara state, in the Northeast by Ekiti State and in the South by Ogun State (Olatunji *et al*., 2013). According to the 2006 population result by National Population Commission Osun State has a population of 3.3 million consisting of 1,740,619 males and 1,682,916 females (NPC, 2006). Osun State has eleven forest reserves, which cover a total area of 91,268 hectares (ha) of which 67.5% or 61625ha are forested (see Figure 1). The eleven forest reserves are; Ago- Owu, Ede, Ejigbo, Ife Native Authority, Olla, Ikeji- ipetu, Ila, Oba Hills, Oni, Osogbo and Shasha forest reserves. Five of these Forest Reserves (Ago – Owu, Shasha, Ife Native, Oba Hill and Ikeji- Ipetu Forest Reserves.) were purposively selected for this study. All the selected forest reserves are within the lowland rainforest areas of Osun State and have large area covered and have high floristic composition. The women in the study area use firewood and its derivatives (e.g. charcoal) as the major source of domestic energy The total number of women who used charcoal (a derivative) of firewood and its sales to urban centres was high in the study area which encouraged men in this area to increase charcoal production. The implication of this is that more wet/live woody trees are cut.

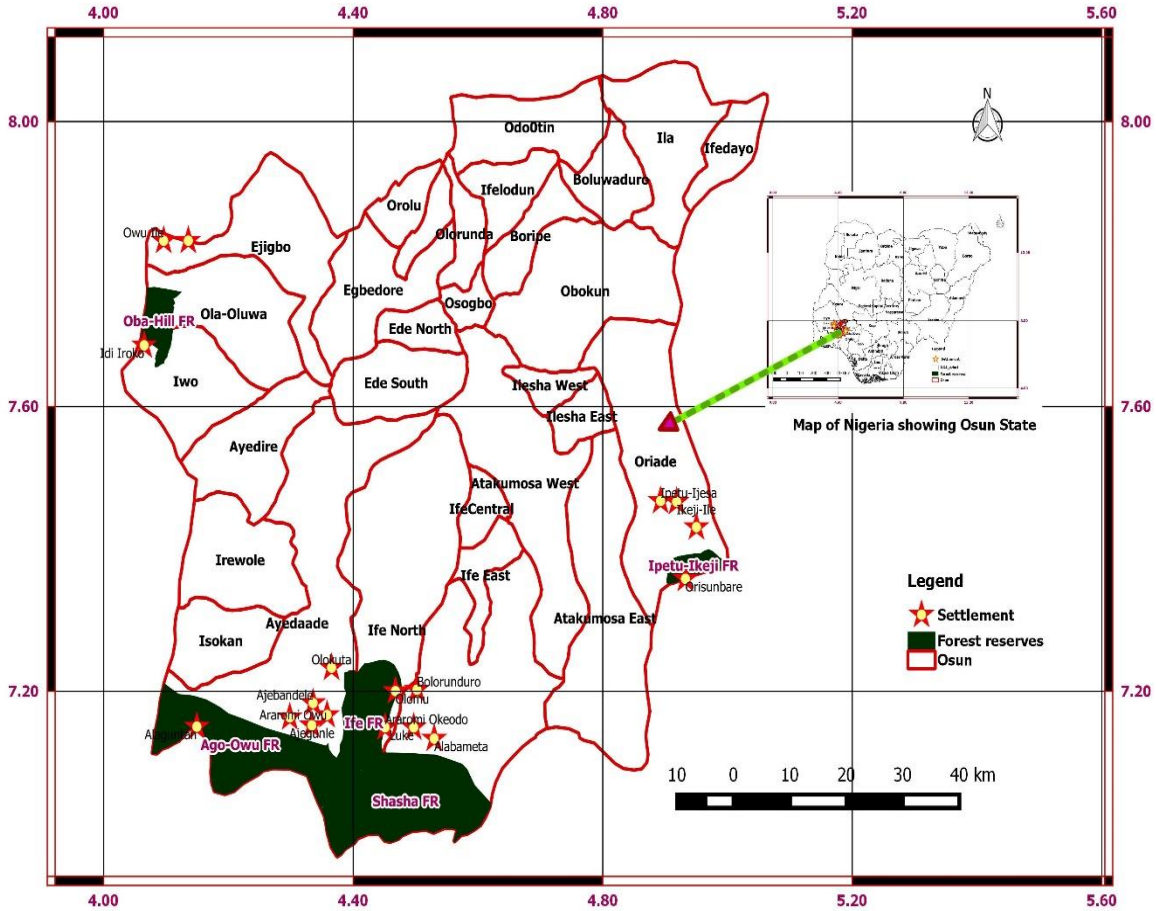

Figure 1 Location of the selected Forest Reserves in Osun State.

Methods of Data Collection

Five forest reserves were purposively selected from which five villages were selected each. The villages were of 5 - 7km radius from one to another and to the forests. A total of 25 villages were randomly selected through this procedure. From the 25 villages, house listing was done and then a systematic random sampling method was adopted in the selection of respondents for the survey. Adult women were targeted for household survey because they were majorly mothers and they were saddled with the responsibility of cooking meal and taking care of the whole household. One hundred household each from each forest reserve were selected to make a total of five hundred questionnaires that were administered for household survey. Also In-depth interview was conducted in which two elderly people (one man and one woman) of ages between 55 and above years; preferably the village heads or chiefs were selected for this interview. The total number of villages selected for this study was twenty five and two people from each making a total number of fifty respondents. The reason for selecting these people for in-depth interview was basically their ability to mention the conditions of weather and climate for a total number of 30-35 years. Also in order to give concise information that will augment information from the questionnaire survey. The data collected were subjected to descriptive statistical analysis such as frequency distributions, tabulation and percentages.

3. RESULTS AND DISCUSSION

Preferred Forest Resources collected by Women

Table 1 show women's preferred forest resources utilized. The preferred forest resources by women were firewood for domestic purposes with Ikeji-Ipetu having 94 out of 100, Shasha FR having 93 and Oba Hill FR having 92. Ife Native Authority and Ago-Owu FRs have 90 and 89 respectively. This study revealed that most women preferred firewood for domestic purposes than for any other uses especially, for commercial purpose which is just about 2.4%. This finding corroborate Asifat (2012) and Ayanlade (2016) which revealed that many women cannot afford to use fossil fuels in view of the erratic nature of electricity in Nigeria, the scenario that has increased the pressure on the use of fuel wood.

Table 1 Women Forest Resources Utilisation and Management

	Option	Oba FR	Ikeji FR	Ago-Owu	Shasha	Ife	%
Women involvement in forest resources utilization	Low	95	96	97	96	97	96.2
	High	4	3	2	3	2	3.8
Perception of respondents on women involvement in timber log cutting	Agreed	8	9	8	6	3	6.8
	Strongly-Agreed	-	-	-	-	-	-
	Disagreed	0	2	8	24	32	13.2
	Strongly Disagreed	92	89	84	70	65	80.0
Preferred Forest Resources utilisation by women	Timber log	1	2	2	1	1	1.4
	Sap/latex	-	-	-	-	-	-
	Honey	4	5	0	0	0	1.8
	Domestic firewood	92	94	89	93	90	91.6
	Commercial firewood	3	1	3	1	4	2.4
	Leaves for wrapping	79	63	88	94	90	82.8
	Medicinal Plants	14	14	37	26	30	24.2
	Animals	4	3	4	6	5	4.4

	Fruits	39	49	60	62	52	52.0
	Pole	-	-	-	-	-	-
	Charcoal	-	-	-	-	-	-
Taungya System	Yes	36	26	30	19	23	26.8
	No	64	74	70	81	77	73.2

Source: Author's fieldwork, 2017

Types of firewood gathered by women

Table 2 shows that 14.8% of the respondents collected dead but standing woody trees and shrubs, 66% of the respondents collected fallen woody trees and branches and 19.0% cut and collected live (wet) woody trees and branches probably in anticipation of the likely insufficient dead woods in the area. This indicated that, more live trees (19%) collection than dead but standing woody trees, the act which could endanger the forest sustainance. This discovery supported Yahya (2002) which reported that the cutting down of wet wood is on the increase in Nigeria.

Table 2 Types of firewood collected by women in the selected Forest Reserves

	Oba Hill %	Ikej-Ipetu %	Ago-Owu %	Shasha %	Ife Native%	Overall %
Dead but standing woody tree	11.0	18.0	15.0	17.0	13.0	14.8
Fallen woody trees and branches	69.0	67.0	60.0	63.0	71.0	66.0
Live (wet) woody trees/shrubs	20.0	15.0	24.0	19.0	17.0	19.0
Total	100	100	100	100	100	

Women Engagement in Enhancing Forest Resources

Table 3 shows that most women did not engage in tree planting. It was discovered that 87.2% of the women interviewed did not practice tree planting while 12.8% did. This indicated that woody trees were cut with no replacement, the action which may pose danger to the environment. On the strategies that can enhance forest and forest resources, women involvement was low with 63% showing uncared attitude towards strategies to enhance forest regeneration. As if to compound the problem, the respondents, as revealed in Table 3 seemed not bothered with selective exploitation of forest resources. This implies that any woody tree and shrub whether matured or immature were cut and that no protective measure against illegal cutting was done by women. Thus, in the absence of afforestation, the forest land is exposed to soil erosion and the land becomes which could aggravate greenhouse effects.

Table 3 Enhancement of Forest Reserve by Women

	Option	Oba Hill	Ikeji -Ipetu	Ago-Owu	Shasha	Ife	%
Tree Planting	Yes	9.0	6.0	21.0	12.0	12.0	12.0
	No	91.0	94.0	79.0	94.0	88.0	87.0
Strategies and level of women's involvement	Afforestation	9.0	6.0	21.0	12.0	12.0	12.0
	Agro forestry	36.0	25.0	22.0	19.0	23.0	23.0
	Selective Forest exploitation	0	0	0	0	0	0
	Uncared Attitude	55.0	69.0	57.0	69.0	65.0	63.0

Source: Author's fieldwork

Women awareness of Climate Change and its effects on the environment

Awareness of climate change was low in all the FR as presented in Table 4. About 15.4 % of the women interviewed were aware of climate change and its effect and 84.6% were not aware. Table 4 shows that 21% of Ife Native Authority women were aware of climate change and its effect on the environment, 18%, Shasha FR, 15% from Oba Hill, 11% and 12% for Ago-Owu andIkeji-Ipetu

forest reserve respectively had heard about climate change and its effects on the environment but could not really explain what it entails.

Table 4 Awareness of Climate Change by the Respondents

Variable /FR	Option	Oba Hill (a)	Ikeji (b)	Ago-Owu (c)	Shasha (d)	Ife (e)	Overall %=[(a+b+c+d+e}/500)x100]
Awareness of climate change	Yes No	15.0 85.0	12.0 88.0	11.0 89.0	18.0 82.0	21.0 79.0	15.4 84.6

Report of In-depth Interview on women utilisation, protective measures and their awareness of the impacts of climate change

Table 5 shows that women preferred forest resource in the study areas was firewood which is meant for domestic purposes across the study areas whether emphatically mentioned or not. Also it was discovered that women engaged in cutting and collection of firewood for domestic purposes more in Oba Hill, Ago-Owu and Ikeji-Ipetuthan in Shasha and Ife Native Authority. This could also lead to deforestation; which is one of the causes of climate change. This was corroborated by Asifat (2012) that the problem of fuel wood sourcing is rooted in the inability of the poor women to get fossil fuel derivatives like kerosene and natural gas. Also, Cline-Cole *et al*., (2015), revealed that, this problem was aggravated with the additional price of fuel (crude oil) by the government which made the ability to meet the household needs for cooking and heating to be difficult which eventually led to unsustainable and unmonitored collection of forest trees for fuel wood leading to environmental degradation. This study also revealed that women in the study areas were found to be involved in timber log cutting and collection for commercial purposes. The interview conducted revealed that women also contributed to environmental degradation.

The in-depth interview revealed that those involved in the interview were aware of the change in the weather condition by their experiences. For instance, the respondents indicated that there was a rising temperature year back and that rainfall has taken another pattern in recent times when compared to what it used to beyears back and that their experience has shown that rainfall start late with lower volume than in the past. This, views corroborated Beniston, (2010) which stated that climate change is becoming evident on the attributes of weather conditions. This situation has eventually resulted in environmental degradation and heightened competition for natural resources and arable land. Thriving pests is another indication of climate change which was mentioned across the study areas. It was observed that the most of the respondents have not heard the scenario of climate change but many of them claimed to notice the impacts.

Table 5 Report on In- Depth Interview conducted in selected Villages on women's utilization, protective measures and their awareness of the impacts of climate change on the environment.

Issues	Option	Oba Hill	Ago-Owu	Ikeji-Ipetu	Shasha	Ife
Resources preferred by men	Timber	++	+ +	+	+ +	+ +
	Firewood for domestic purpose	-	-	-	-	-
	Firewood for commercial purpose	+ +	+ +	+ +	+ +	+ +
	Leaves	-	+	-	+	+
Resources preferred by women	Timber	-	-	-	+	+
	Firewood for domestic purpose	+ +	+ +	+ +	+	+
	Firewood for commercial purpose	-	-	-	+	+
	Leaves	-	+	+	+	+

Roles of women in forests resources degradation	Low	-	+	+	+	+
Care of forest	Government through forest guards	+ +	+ +	+ +	+ +	+ +
	Village heads	-	-	-	-	-
	Village women	-	-	-	-	-
Awareness of impacts of climate change on the environment	Rising temperature	++	++	++	++	++
	Too little rainfall	++	++	++	++	++
	Thriving pests	-	-	+	+	+

Source: Author's fieldwork, 2017

Note: **+ +** indicated where an opinion was emphasized
+ indicated where an opinion was merely identified
- indicated where an opinion was not mentioned

4. CONCLUSION

The study investigated forest utilisation by women and its consequence on the environment in five selected forest reserves in Osun State, Nigeria. Questionnaire administration to five hundred households and the In-depth interview showed that the preferred forest resources by women were wood fuel products purposely for domestic purposes. The study further revealed that although women involvement in forest resources collection existed but their replacement (i.e. afforestation) was low. The respondents for in-depth interview revealed that the impacts felt in the environment such as increased temperature, little rainfall and thriving pests were found. This shows that this environment is already exposed to the danger of climate change scenario. This poses great danger to the people and the entire environment. Therefore, women should be enlightened on the danger of indiscriminate and illegal felling of live trees. They should be introduced to other sources of energy for their usage. The women in this study area should be encouraged to practice afforestation to enhance its sustainability and that the government should rise to its responsibility to protect environmental biodiversity, including the forest resources.

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