

GENDER ROLES AND LIVELIHOOD ACTIVITIES: IMPLICATIONS ON ADAPTATION TO CLIMATE CHANGE IN SOUTH-WEST NIGERIA

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Abstract

In most parts of developing world, females are saddled with different roles they played in the households/ or communities. These roles impinge their capacity and ability to adapt to climate change. This study examined the implications of gender roles on adaptation to climate change and the livelihood options of male and female farmers in Ekiti and Ogun States, Nigeria. Employing a questionnaire survey, data were collected from 358 male and 222 female farmers using a multi-stage sampling procedure. Data obtained were descriptively analysed. In terms of gender roles, more female farmers were mostly involved in production tasks and reproduction tasks while male farmers were more involved in community development tasks and politics. For livelihood activities, more male farmers were involved in on-farm livelihood activities than female farmers, however, female farmers engaged more in off-farm livelihood activities than male farmers while more farmers were involved in non-farm livelihood activities. This study thus recommends that climate change interventions should be gender-responsive considering the livelihood interest, constraints and multiple roles of female farmers and that capacity building of female farmers should accommodate labour-saving technologies, solar energy sources and borehole.

Keywords: adaptation, change, climate, gender, roles, livelihoods

Introduction

Agriculture is the most important economic activity providing food, employment, foreign exchange and raw materials for industries in many developing of countries like Nigeria (Lawal *et al.*, 2021). Specifically, rural Nigeria is characterised by agrarian livelihood as well as other primary production activities such as animal husbandry and fishery activities (Aderinoye-Abdulwahab *et al.*, 2015). Despite its significance in economic development, the sector is the most vulnerable to climate change impacts because of its over-dependence on rainfall systems (Antwi-Agyei and Stringer, 2021). Agricultural practices in African nations

especially Nigeria rely on the natural weather conditions of the locality (Ogunpaimo, *et al.*, 2012). Climate change is a major threat to sustainable growth and development in Africa, and most especially Nigeria (Enimus and Onome, 2018). It is a significant addition to the spectrum of environmental hazards faced by man affecting ecosystems, water resources, food, gender, health. Coastal zone, industrial activities and human growth (Ezenwa *et al.*, 2018). Climatic change is defined as alteration in the mean values of climate indicators like temperature and rainfall, resulting in extreme weather events such as storms, droughts, floods, hail, and heat waves over a long period of time. According to Elisha

et al. (2017), climate change is caused by two basic factors namely natural processes (bio-geographical) and human activities (anthropogenic).

In Nigeria, climate change is evident in the form of more frequent heavy rainfall event, unpredictable rainfall patterns, drought and increased temperature (Esan *et al.*, 2021). The evidence that climate change will adversely affect agriculture in Nigeria has become a crucial challenge (Enimus and Onome, 2018). The most peculiar effect of climate change in Nigeria is declining agricultural productivity arising from the irregular rain and unpredictable farming calendar (Anabaraonye *et al.*, 2018). Climate change affect almost all stages of the farming systems with rural farmers more vulnerable to its effects as a result of their low infrastructural capacity as well as high dependence on weather signals for farming activities (Ifeanyi-Obi *et al.*, 2017).

As a response to the effects of climate change, farmers are involved in other non-farm activities to supplement their income from farming activities as a form of adaptation strategy known as diversification. Adaptation is in short, a counter-measure to the effects posed by climate change. It is any activity that reduces climate change-induced damages (LazKano *et al.*, 2016). The roles, responsibilities, rights, entitlements and opportunities attached to being a male or female could have significant effects on their ability to adapt to climate change. Gender roles are activities carried out or performed by an individual based on his/her sex as constructed by the norms and values of society (Deji, 2021). According to Issa *et al.* (2015), gender is a very critical aspect of all development initiatives such as agriculture and climate change in particular. Gender as a social construct that portrays the distribution in role and opportunities associated with the male and female sexes and the social relations between them (Chavez *et al.*,

2011). Gender relationships and social prescriptions for the roles of males and females are not static, however, even in traditional cultural setting, gender roles have witnessed changes (Olawoye *et al.*, 2004) over time. Climate change does not affect men and women in the same way and women are more vulnerable (Onwutuebe, 2019). This is because, men have a higher adaptive capacity to cope with the adverse impacts of climate change than women as a result of patriarchal privileges (Onwutuebe, 2019). Despite that women make up 70% of the agricultural labour force, 60-70 percent of food producers, approximately 100% of food processors, 80% of food storage and transportation from farm gate to market gate, 90% of hoeing and weeding, farm work, and 60% of harvesting and marketing services (Apata, 2013; Jost *et al.*, 2016), they are still burdened with roles and responsibilities that predispose them more to the effects of climate change than the males. Research have been conducted on climate change and gender (Assan *et al.*, 2018, Adzawla *et al.*, 2019), a research gap still exist with respect to the livelihood options as adaptation measures of climate change and implications of gender roles and responsibilities on the ability of male and female farmers to adapt to climate change in developing countries like Nigeria.

Objectives of the Study

The broad objective of this study was to assess the gender roles and livelihood activities and their implications on climate change adaptation in Southwest Nigeria. The specific objectives of this study were to:

- i. describe the socioeconomic characteristics of male and female farmers in Ekiti and Ogun States;
- ii. ascertain gender roles and their implications on climate change adaptation; and

- iii. identify male and female on-farm, off-farm, and non-farm livelihood activities and their implications on climate change adaptation.

Methodology

Study Area

The study was conducted in Ekiti and Ogun States Nigeria. Ekiti State was carved out from the old Ondo State on October 1st, 1996. Geographically, the State is located in the Southwest of Nigeria between longitudes 4°51' to 5°45' east of Greenwich meridian and on latitudes 7°15' to 8°51'N of equator. Ekiti State is bounded to the north by Kwara and Kogi States, to the west by Osun State, to the east by Edo State and to the south by Ondo State. The State occupies an area of 6,353kmsq and enjoys generally tropical climate with two distinct seasons. The annual temperature of Ekiti State ranges from 21° – 28°C (Oluwasusi and Tijani, 2013) with a mean annual humidity of 75% (Olujobi, 2015). The State is an upland zone and experiences a mean annual rainfall ranges between 1200mm and 1800 (Ugwuja *et al.*, 2011). The major vegetation being rain forest, deciduous forest and semi-grasslands. Tropical forest exists in the south of the State while guinea savannah occupies the northern peripheries of the State. Crops grown in the State include cocoyam, yam, rice, cassava, plantain, maize, oil palm, beans, fruits and vegetables (Obisesan and Akinola, 2021).

Ogun State was created on February 3rd, 1976 from the old western region. Geographically, the State lies within latitudes 6° 12'N and 7 ° 47'N in the tropics and longitudes 3 ° 0'E and 5 °0' East of Greenwich meridian (Adeleke *et al.*, 2015). The State covers 16,409.26 kilometres and shares an international boundary with the republic of Benin to the West and interstate boundaries with Oyo State to the north, Lagos and the Atlantic Ocean to the South and Ondo State to the

east. The State is located in moderately hot, humid tropical climatic zone of Southwest, Nigeria. The climate of Ogun State follows a tropical pattern with two distinct seasons (the rainy season which lasts from March/ April to October/ November till March/ April). The annual rainfall of the State value ranges between 1,400mm and 1500mm with an average temperature of 30°C). The humidity is lowest at the peak of the dry season in February, usually at 37-54% and highest between June and September with a value of 78-85% (Adeleke, 2015). Ogun State has two main vegetation, namely, tropical rain forest and guinea savannah. Important arable crops cultivated in the State include: maize, yam, cassava, rice, cocoyam, groundnut and melon (Solanke, 2015).

Sampling Techniques and Sample size

Multi-stage procedure was employed to select the study areas for this research. At stage one; two States (Ekiti and Ogun States) were purposefully selected from the six States in southwest Nigeria because of their similarities in ecological features. At stage two, 2 zones were randomly selected out of the three zones in Ekiti State and four zones in Ogun State Agricultural Development Programme. At stage three; six and eight blocks were randomly selected from the zones chosen from Ekiti and Ogun States respectively. Finally, respondents were randomly selected from the lists of farmers belonging to National Agricultural Cooperative (NACOOP) in each of the selected States. For Ekiti State, there were 1400 members of NACCOP and 1002 for Ogun State. Using Krejcie and Morgan's (1970) method for sample size determination, a sample size of 302 NACOOP members comprising 175 male and 128 female were selected in Ekiti State while a sample size of 278 NACOOP members comprising 184 male and 94 female farmers were selected in Ogun State.

Data Collection

The study employed a quantitative method (questionnaire) of data collection. A questionnaire is a research instrument consisting of a set of questions (items) intended to capture responses from respondents in a standardized manner (Bhattacharjee, 2012). The questionnaire was designed in phases to capture questions on farmers' socio-economic characteristics, livelihoods activities and gender roles. The instrument for data collection was pre-tested using test-retest method at two weeks interval to measure the degree of its consistency and obtained reliability coefficients of 0.70 and 0.82 for livelihood activities and gender roles respectively. Farmers' livelihood activities and gender roles were measured as agreements of farmers with a list of options provided using dichotomous variables of 'yes and no' and aggregate scores determined.

Data analyses

The data obtained were analysed by using Statistical Package for Social Sciences (SPSS) window version 23. The analytical tools employed in this study were descriptive statistics (percentages, tables, frequencies and means).

Results and Discussion

Socioeconomic characteristics of the respondents

Results of the descriptive analysis on Table 1 indicate that the average age of farmers was 45 years for males and 49 years for females. This could indicate that both categories of farmers were economically active and at the same time engage in different livelihood activities. This result conforms to Owombo *et al.* (2014) who reported 46.3years and 45.5 years for male and female respondents respectively in a study on climate change. According to the survey, 86.5% of male farmers possessed higher formal education than female farmers (75.8%). As a result, it is assumed that the majority of male

farmers could comprehend the concept of climate change than female farmers. In addition, male and female farmers had an average of 23years and 19years of farming experience respectively. This indicates that the respondents might have been responding to climate change by diversifying into different livelihood choices as a strategy of adaptation to climate change. This observation is similar to the report of Oluwasusi and Tijani (2013) who found that the majority of their respondents had more than 20years of farming experience. Furthermore, male farmers cultivate an average of 4.2ha, whereas female farmers cultivate an average of 1.7ha. This differential could enable the male farmers to be more involved in on-farm enterprises as a result of their greater access to land and ability to use more adaptation measures requiring the use of land. A higher percentage of male (43.3%) and female (42.8%) farmers earned less than 21,000 naira from farming per year. This could suggest that the respondents were low-income earners who could diversify into non-farm activities as a strategy for adaptation to climate change. Results from this study is similar to Owombo *et al.* (2014), who reported a mean annual income of 23.211.4k for men and 13.768.8k for women farmers in a research conducted on climate change. In addition, 85% of male and 82% percent of the farmers were married and had a mean of six people per households. This could indicate availability of support for both domestic and production chores. The results from this study corroborates Adeagbo *et al.*, (2021) who reported an average of 6 persons per household in a study conducted on climate change in southwest Nigeria.

Table 1: Distribution of respondents based on socioeconomic characteristics

Socioeconomic Variables	Male farmers (%) n=358	Female farmers (%) n=222	Mean value (\bar{x}) Male / Female
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Age (years)			
Below 20	0.03	0.05	
21-30	13.4	14.9	49/45
31-40	15.1	20.3	
41-50	29.5	41.9	
51-60	19.8	13.1	
Above 60	24.9	9.5	
Marital status			
Single	11.5	6.3	
Married	85.0	82.0	
Widow (er)	2.8	8.6	
Divorced/ separated	0.8	3.2	
Family size			
0-5	17.6	45.9	
6-10	73.5	52.3	6
11-15	7.5	1.8	
16-20	1.4	0.0	
>20	0.0	0.0	
Education			
No- formal education	13.5	24.2	
Formal Education	86.5	75.8	
Farming experience (years)			
0-5	13.1	19.8	
6-10	18.2	18.5	
11-15	13.7	9.0	
16-20	11.7	14.0	23/19
Above 20	43.3	38.7	
Farm size (hectares)			
0-2	17.0	75.2	
3-5	67.1	9.5	4.2/1.7
6-8	8.4	7.2	
Above 8	7.0	0.1	
Average annual income (₦)			
Less than 21,000	43.3	42.8	
21,000-40,000	12.5	14.4	
41,000-60,000	21.7	22.5	
61,000-80,000	4.5	4.1	
81,000-100,000	3.9	10.9	
Greater than 101,000	19.9	10.9	

Source: Field Survey, 2020

Gender Roles of the Respondents

Table 2 shows that the majority of respondents were involved in production tasks such as planting (male-84.7 percent, female-94.1 percent), gardening (male-69.9%, female-83.3 percent), agro-processing (female-99.5 percent), and animal husbandry (male-69.9%, female 83.3 percent) (female-86.1 percent). This suggests that female farmers were more active in the production chain than the males. In addition, as a result of sex, all female farmers were involved in reproduction chores, whereas 41.8 percent of male farmers were active in child-rearing. Female farmers also performed domestic activities such as cooking, washing, cleaning/sanitation, caring for the workers and the future workforce, fetching water, collecting water, and caring for family members (monitoring the sick, elderly, and disabled) due to cultural traditions. The female respondents could be more prone to the effects of climate change than the male farmers because of the extra time involved in looking for water for domestic and productive tasks because climate change affects availability of water. These observations corroborate Ezenwa *et al.* (2018) who reported that 76.9% of his female respondents were involved in domestic tasks. Furthermore, the male farmers were more committed to community development tasks and politics, such as village meetings (male-83 percent, female-41.9%), whereas all males were involved in political meetings, voting, and elections, compared to 83.3 percent of female farmers. This could imply that female farmers are grossly absolved by domestic, productive and gender roles to the detriment of community development tasks. Consequently, the less involvement of the female farmers in the community development tasks, the lesser their representativeness in decision making on community development issues.

Table 2: Distribution of male and female farmers based on gender roles

Gender roles	Male farmers (%)	Female farmers (%)
Production tasks (paid and unpaid)		
Planting	84.7	94.1
Gardening	69.9	83.3
Agro-processing	7.2	99.5
Animal husbandry	6.4	86.1
Reproduction tasks		
Child bearing	0.0	100
Child rearing	41.8	100
Domestic tasks		
Cooking	5.3	100
Washing	28.4	100
Cleaning/ sanitation	25.3	100
Workforce	34.0	100
fetching of water	12.0	100
Collection of firewood	6.7	100
Caregiving for family (monitoring of sick, elderly and disabled)	24.0	100
Community development tasks and politics		
Attendance of village meeting	83.0	41.9
Political meeting, voting and election	100	83.3

Livelihood activities

Male and female farmers’ involvement in on-farm livelihood activities

In Table 3, male and female farmers’ livelihood activities are presented. Crop production was carried out by all of the surveyed respondents (male=100%, female=100%), showing that crop production is the primary and dominating agricultural enterprise in the research area. This finding corroborates the report of Otitoju and Enete (2016) who confirmed that crop production is the dominant agricultural enterprise that farmers in Southwest Nigeria engage in. However, Alkali *et al.* (2021) reported that 65.3% of their female farmers were involved in crop production in Borno

State, North Eastern Nigeria. The probable reason for the difference could be linked to religion reason in Northern Nigeria where the females are restricted in major farming activities. In addition, findings from this study show that male farmers were more involved in on-farm activities such as fishery/fishing (25.1%), piggery (20.0%), snailery (6.1%), and bee keeping (2.3%) while female farmers were mostly engaged in poultry (80%), goat rearing (60.8%), and sheep rearing. This result is in support of analysis of livelihood activities reported by Okunlola *et al.* (2018) in a study conducted on adaptation to climate change in Southwest Nigeria where fishing (15%) was attributed to males and animal production (27.2%) was popular among females. Also, Onya *et al.* (2020) and Alkali *et al.* (2021) observed higher involvement of male and female farmers in livestock farming and fishery activities respectively.

Table 3: Distribution of male and female farmers based on involvement in on-farm livelihood activities

On-farm livelihood activities	Male farmers (%)	Female farmers (%)
1.Crop production	100.0	100.0
2.Fishery/ fishing	25.1	1.8
3.Poultry production	40.0	80.0
4.Goat rearing	22.0	60.8
5.Sheep rearing	4.0	18.5
6.Piggery	20.0	4.9
7.Snailery	6.1	0.9
8.Bee keeping	2.3	0.0

Male and female farmers’ involvement in off-farm livelihood activities

Table 4 shows that male farmers were primarily involved in hired farm labour (60%) and sale of their crop produce (70%). This result is in disagreement with the findings of Ezenwa *et al.* (2018) who observed that 60.7% of their female

respondents were involved in the sales of crop produce. The probable reason could be that gendered livelihood activities may vary across tribes and countries. All female farmers (100%) were primarily involved in the processing of agricultural produce and collection/ sale of Non-Timber Forest Products (NTFPs) such as wild fruits, leaves, mushrooms, snails, and vegetable leaves, as well as the processing of agricultural produce. This study shows that the female farmers rely on NTFPs for supporting their income, it is worth noting that these products are easily threatened by climate change. The report from this study is in tandem with Aderinoye-Abdulsalam *et al.* (2015) who reported that crop processing is associated with the women. In addition, female farmers were mostly engaged in firewood collecting (42%), sales of charcoal (15%), and food vending (38%). The findings of this study corroborates Edeghon and Koledoye (2017) who reported that food vending is dominated by women. In addition, Assan *et al.* (2019) noted that their female respondents were engaged in selling of firewood, wild fruits and vegetables and livestock.

Table 4: Distribution of male and female farmers based on involvement in off-farm livelihood activities

Off-farm livelihood activities	Male farmers (%)	Female farmers (%)
1.Collection/ sales of Non-Timber – Forest Products	32.0	100.0
2.Collection and Sales of firewood	15.0	42.0
3. Charcoal production/ trading	4.0	15.0
4. Processing of agricultural produce	18.0	100.0
5. Fishing processing	0.0	12.6
6. Hunting	10.0	0.0
7. Hired farm labour	60.0	43.0
8.Sawmilling/ Lumbering	8.0	5.0
9. Food vending (raw and cooked)	0.0	38.0
10.Craftworks	6.0	4.0

(weaving of mesh, basket and mat)		
11.Sales of crop produce	70.0	60.0
12.Production and sales of broom	1.1	10.0

Male and female farmers’ involvement in non-farm livelihood activities

Result in Table 6 shows that commercial motorcycling, welding, cobbling, vulcanizing/ mechanizing, carpentry/ brick making, and commercial motor driving were identified as non-farm livelihood activities primarily practised by male farmers, while trading and hired labour were identified as non-farm livelihood activities primarily practised by the female farmers. The findings from this study affirmed that vulcanizing, motorcycling (okada riding), basket making and carpentry, welding are the basic livelihoods associated with the males (Aderinoye-Abdulwahab *et al.*, 2015) while petty trading, hair plaiting and tailoring are basically practised by the females (Edeghon and Koledoye, 2017; Alkali *et al.*, 2021). Non-farm activities are crucial because they adaptation measures that farmers can diversify into and could also provide income leverage when farming is impacted by climate change.

Table 5: Distribution of male and female farmers based on their involvement in non-farm livelihood activities

Non-farm livelihoods	Male farmers (%)	Female farmers (%)
.Motorcycling	10.6	0.0
. Welding	2.0	0.0
.Vulcanizing/ mechanizing	5.0	0.0
Trading	3.4	15.8
Carpentry/ brick making	2.8	0.0
Hired labour	6.0	14.4
Commercial motor driving	2.2	0.0
Cobbling/shoemaking	1.4	0.5
Tailoring	4.2	9.0
Hair dressing/ hair cuts	2.7	12.6

Conclusion and recommendations

This study focussed on gender roles and livelihood activities of male and female farmers, implications on adaptation to climate change. These study reveals that male and female farmers had unequal access to land and formal education, with female farmers at the receiving end. The implication is that female farmers' ability to adapt to climate change could be limited when compared to male farmers because these resources are vital in strengthening the adaptive capacity of farmers. Consequently, the female farmers could be rendered vulnerable to the effects of climate change than the male farmers. Crop production was the primary and dominating agricultural enterprise practised by the respondents. The implication is that crop production is very sensitive to climate change and thus diversification of livelihood is essential to reduce the effects of climate change. In addition, the respondents were engaged in non-farm livelihood activities which they can venture into as adaptation strategy. Findings from this study shows that male and female farmers' livelihood choices differ and also, the livelihood choices are tied to their gender. The results further showed that the respondents were involved in socially constructed roles and responsibilities, with the female farmers performing more of production, reproduction and domestic tasks while the male farmers were mostly involved in community development tasks and politics. Findings from this study show that the female farmers combined their numerous gender roles with economic activities, and also, female farmers' involvement in community development tasks is lesser than that of male farmers. This is an indication that the various tasks performed by female farmers within the households could interfere with their ability to acquire climate change adaptation interventions and that their roles of securing water for domestic tasks

and production tasks could become cumbersome and at the same time expose them to environmental danger and other vices. In addition, the female farmers had unequitable participation in community development tasks compared with the male farmers, this could hinder their representativeness in decision making at community level. There is need for government through extension agents to take climate-related information to door-steps of farmers to enable female farmers benefit. Also, formulation of gender-sensitive strategies are essential to enable improve the adaptation capacities of both categories farmers. The study therefore recommends that climate change adaptation intervention strategies should be gender specific.

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