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GENDER ROLES INCLIMATE CHANGE ADAPTATION STRATEGIES BY CASSAVA-FARMERS IN GOKANA LOCAL GOVERNMENT AREA, RIVERS STATE

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ABSTRACT

The study examined gender roles in climate change adaptation strategies used by cassava-based farmers in Gokana Local Government Area of Rivers State, Nigeria. It specifically described the socio-economic characteristics of cassava farmers across all gender levels, identified adaptation strategies practiced by these farmers across gender levels and the problems encountered by cassava farmers in the use of adaptation strategies in the study area. Multi-stage sampling technique was used to select 60 respondents in the study area. Data were analyzed using descriptive statistics. The results of socio-economic characteristics of the farmers showed that 56.6% of the male farmers were married which is greater than 46.60% of the married females. The males had more average income of ₦1,620,000.13 compared to ₦ 133,000.66 for the females. The females had more farm experience than the males, while the male cultivated larger farms. The main adaptation strategies used by cassava farmers in the study area were change of planting date, moving to a different site, mixed cropping and changing the timing of land preparation. Irregular extension services were the major constraint faced by the cassava farmers with a mean value of 3.722 for male farmers and mean of 4.411 for female farmers. It is concluded that gender plays several roles in climate change adaptation strategies in cassava-based farming in the study area. Based on the findings, efforts should be made by government and relevant stakeholders to educate cassava farmers on climate change adaptation strategies along gender lines.

***Keywords**: Gender, adaptation strategies, roles, climate change, cassava-based farmers*
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INTRODUCTION

Africa is the largest producer of cassava compared to other continents, with 62% share of the total world production of cassava (Sanni et al., 2009). Nearly two-thirds of total cassava production in Africa (38.3 million tones) is grown in Nigeria, making it the largest in the world with about 19% of global market (Adebayo et al., 2009). Cassava is the most important staple

crop in Nigeria. Cassava contributes to the well-being of Nigerians both as a subsistence crop for household and as a commodity for commercial purposes (Kalu, 2006). Cassava is a food security crop and perceived as a "Famine fighter" (Henri-Ukoha et al., 2011), with high poverty reduction potential due to low cost of production (Asante-Pok, 2013). Although Nigeria grows cassava in large quantities, its cultivation is on a small-scale level, often in fields to be set aside as fallow or even cropped on marginal soils, replacing crops that require greater soil fertility (Adebayo et al., 2009). Climate change which is characterized by natural climate cycle and human activities, has adversely affected agricultural productivity in Nigeria (Ziervogel et al., 2006). As the planet warms, rainfall patterns shift and extreme events such as drought, flood and forest fires become more frequent, this results in poor and unpredictable yields which subject farmers to vulnerable circumstances (United Nation Framework and Convention on Climate Change, 2007).

Gender roles are patterned by different social and cultural contexts they exist in. Certain factors like country/region, ethnic group, age, economic class and religion all have an effect on which roles and responsibilities that men and women, boys and girls are expected to have (FAO, 2012). This considers the concerns and experiences of both women and men as an integral dimension of all agriculture and rural development efforts.

Adaptation to climate change refers to a general plan for addressing the impacts of climate change, including climate variability and extremes. It includes a mix of policies and measures selected to meet the overreaching objective of minimizing the country's vulnerability (United Nations Development Programme, 2006).

Despite the overriding position of cassava in Nigerian agriculture, the perception of farmers and their attitude towards cassava production are often poor and left in the hands of peasants farmers who mostly produce at subsistence level. The socio-economic characteristics of individual households have been identified as basic factors that influence the food security status of households (Sanusi & Salimonu, 2006). On the other hand, the natural resource base on which these farmers depend will be altered, traditional socio-economic safety nets will be stressed and the potential for future agricultural development will be affected with the lingering climate change saddle (Food Agricultural Organization, 2012).

In the same way, since agricultural production in Nigeria relies mainly on rainfall for water, climate change may result in loss of agricultural land with shorter growing season and lower yields and could expose more people to risk of hunger (Fischer, 2002).In addition, farmers who constitute the bulk of the poor in Nigeria face challenges of tragic crop failures, reduction in agricultural productivity, increase in hunger, malnutrition and disease (Apata, Samuel & Adeola, 2009). This climate change variability is worsened as some developed cassava varieties are not acclimatized to the rural environment; not built on the indigenous knowledge of the farmer to provide for sustainability of the new practices (Ajayi, 2016). More so, social inequalities put

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many poor people on the frontline of dangerous climate change impacts while constraining their options for taking action to reduce it through adaptation (Casteneda & Acquah, 2012). These are evident in the impeding land tenure system and shortage of labour which thus inhibit the collective participation of all gender towards ameliorating the harmful excesses of climate change. Furthermore, problem of climate change adaptation will result to decline in production as expenses on cassava production is not commensurate to the investment thereby scaring the vulnerable poor cassava farmers from active involvement in cassava production. Other problems are poor irrigation system, inadequate information, inadequate capital and low technical know-how across gender participants in cassava production.

This implies that critical awareness of effective measures to deal with gender inequalities are important for the development and formulation of policies and programmes that can tackle the issue of climate change (Casteneda & Acquah, 2012). It is on these foregrounds that this study examined gender roles in climate change adaptation strategies used by cassava-based farmers in Gokana Local Government Area of Rivers State, Nigeria. Specifically, the paper described the socio-economic characteristics of cassava-based farmers across all gender levels in the study area; identified the adaptation strategies practiced by cassava- based farmers across all gender in study area; and identified the problems encountered by cassava-based farmers across all gender levels in the use of adaptation strategies in the study area.

MATERIALS AND METHODS

The study was conducted in Gokana Local Government Area of Rivers State. Gokana is one of the twenty three Local Government Areas in Rivers State. Gokana Local Government Area is located within latitudes $4^{0}23^{1}$ and $4^{0}50^{1}$N and longitudes $7^{0}21^{1}$ and $7^{0}35^{1}$E. it has an annual total rainfall of between 160mm to 298mm , with a relative humidity of over 90% and mean annual temperature of 27^{0}C. The Local Government also constitute a population of 328,500 people, occupying a land area of 126km^{2}, with a density of 2607/km^{2} (Udom, Ushie & Esu, 2002). It is comprised of 8 fishing communities which include; Mogho, K.dere, Bomu, Lewe, Kpor, B.dere and Gbe and 9 inland communities which are: Bera, Nweol, Giokoo, Biara, Deeyor, Nwee Biara, Yeghe, Barako and Denken whose occupations are predominantly arable crop farming. The crops grown in the area are cassava, maize, pumpkin, pepper and yam. The major climatic variable affecting the farmers in Gokana are flood and increase in atmospheric temperature.

Multi-stage sampling technique was used in the study. In the first stage, ten (10) communities were selected purposively from the 17 communities in the study area. This was to get the cassava based farmers in the study area. In the second stage, a compiled list of registered cassava based farmers in the ten communities was obtained from the Agricultural Development Programme Extension Agents resident in the selected communities. From the list, three (3) each of cassava-based male and female farmers respectively were selected randomly from each community. This

gave a total of thirty male cassava-based farmers and thirty female cassava-based farmers in the study area, thus making a total sample size of 60 respondents. Data were collected through the use of questionnaire and interview schedule.

Data were analyzed using descriptive statistical tools such as frequency counts, percentages and mean.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Table 1 above shows that 40% of the males were within (51-60) years of age while 13.30% fell within the age of (30 – 40) years of age with an average age of 49 years. Similarly, 50% of the females were within (51 – 60) years while 6.60% fell within (30 – 40) years of age with a mean of 52 years. This is consistent with the findings of Ayoada (2012) who observed that the cassava-based farmers are young and energetic and they have the strength to practice the adaptation strategies.

The results indicate that 40% of the males acquired primary education and about 13% acquired tertiary education, while about 33.4% of the females had attained primary education and 10% had attained tertiary education, thus signifying that majority of the cassava-based farmers attended primary school. This result is in conformity with the findings of Akinwalere et al., (2016) which revealed that greater percentage of cassava farmers attended secondary school. This signifies that the farmers were educated; although the male farmers were more educated than the female ones. Their high interest in schooling could be because education exposes farmers to innovations and also helps them to adopt them faster.

The findings from Table 1 further reveals that 46.68% of the males' household sizes were within 6-10 persons, while 16.66% were within the household size of 11-15 persons and the mean household size for males was 10 persons. On the other hand, 50% of the females' household sizes were within the range of 6-10 persons while 20% fell within 11-15 persons with the mean household size of 8 persons for female farmers which corresponds with the result of Ayoade (2012). This indicates that male respondents have larger household size than the female respondents in the study area. This could be due to the fact that males are mostly polygamous. The average household size in both group of farmers imply the availability of farm hands which enhance productivity and the practice of more adaptation strategies.

This table shows a mean farm size of 4.45 hectares and 2.83 hectares for male and female farmers respectively. This might be as a result of land tenure system practice in the study area in which lands are mostly allocated to males more than females (Emenyeonu, Henri-Ukoha, Onyemauwa & Okafor, 2018). This also shows that both female and male cassava-based farmers

in the study area are mostly on smallholder farmers, hence, may influence the adoption technology, scale of production, output level as well as the tendency to adopt substantial information to improve on climate change.

It is observed from the table that 56.60% of the male farmers and 46.60% of the female farmers were married. The results also reveal that 13.40% of the males and 6.60% for female respondents were divorcees while 20% of the males and 13.40 % of the females were single. However, 10% of the males and 33.40% of the females were widows and widowers. The result is in line with the observations of Ezikiel et al. (2012) where they stated that majority of the cassava farmers were married. This indicates that there were more married male cassava-based farmers than their female counterparts in the study area. The male farmers who were married are more likely to engage in economic activities that demand they live sedentary or more settled live style which will enable them concentrate on ways to adapt to varying effect of climate change more than the female cassava-based farmers who had lower percentage of married people.

A percentage of 33.40 of male farmers and 26.60 of female farmers were members of cooperative whereas 66.3% of males and 73.4% of females were not. Even as majorities were not members of cooperative societies, male farmers had 33.40 percentages of people who were members of cooperative which is higher than that of the female farmers with a percentage of 26.60%. This might be as a result of male farmers been more educated than the female farmers as shown in their level of education.

The mean farming experience was 20 years for male farmers and 22 years for female farmers which show that female farmers are more experienced than the male farmers. This can be attributed to the fact that more males go to school while females who do not go to school engage in farm work earlier in life implicating for girl child education (Chikezie, et al., 2016).

The male farmers (30%) comparatively had more contact with extension agents than the female farmers (20%). Although, male farmers had more access to extension agents than the female farmers, but both have limited access to extension agents with 80% of female farmers and 70% of male farmers not having access to extension agents. This is not encouraging because contact with or visit made by extension agents provide opportunity for transfer of skills, knowledge and information which facilitate climate adaptation strategies.

The results further reveals the mean income of the male farmers as ₦162, 000.13 and that of the female farmers as ₦133,000.66. This indicates that, the male cassava-based farmers have more average income than the female cassava-based farmers in the study area. This might be that larger household size and more access to farmlands to male farmers than to female farmers served as an edge to the male farmers to gain more average income over the female farmers and

therefore, suggest the possibility of women being more vulnerable than men in adapting to climate change (Enete, 2009).

Adaptation Strategies

Table 2 showed that moving to a different site for the males and change of planting date for females were the most significant adaptation option used in the study area to reduce the adverse effect of climate change. The male farmers also adopted mixed cropping (80%) and change in the time of land preparation (70%) while the female farmers prefer changing the timing of land preparation (80%) and changing the harvest date (73.33%). Others include: use of early maturing crop varieties for females (20%) and use of irrigation/ground watering for males (16.66%), but their low percentages suggest that they are not considered as major adaptation strategies in the study area.

Problems encountered by the farmers

From Table 3, it can be seen that the major constraint faced by the cassava-based farmers in the study area was irregular contact with extension agents which has a mean value of 3.722 for male respondents and 4.411 for female respondents. This implies that they hardly have extension agents visiting them and this therefore pose a problem to them because, they will not be exposed to various information on how to adapt to climate change, hence boost their capacity to increase output. The findings also show that the farmers were faced with lack of access to improved crop varieties; with a mean of 3.533 for male respondents and 4.323 for female respondents. This implies that, the cassava stems the respondents were planting have no resistance to unfavourable effects from climate changes, therefore may result to reduced yield, income, and standard of living. Non-availability of credit facilities which a mean of 3.176 for male respondents and 4.220 for female respondents also cause a great challenge to the farmers as they are not able to purchase the right materials needed for their production. The farmers in the study area also faced the following constraints as: absence of government policy on climate change with mean of 3.321 for male and 4,141 for female, low access to land with mean of 2.523 for male and 4.476 for female, limited knowledge on adaptation measures; with mean of 3.224 for male respondents and 3.102 for female respondents, limited access to water supply with mean of 3.112 for male respondents and 3.091 for female respondents as the major constraints in the study area.

CONCLUSION

Based on the results of the study, male cassava-based farmers had more average income, formal education and larger household size than their female counterparts, whereas the female cassava-based farmers had more years of farming experience than the male farmers. From the findings, gender affected the roles played by cassava-based farmers in adapting to climate change. The

main adaptation measure used by both male and female cassava-based farmers in the area is the change in planting date. However, male cassava-based farmers used more of the climate change adaptation strategies than the females as evident in use of credit facilities to increase production, planting different crop varieties and movement to a different site while change of planting date and change of harvest date were used more by the female farmers in the study area. However, the most serious constraint faced by cassava-based farmers in adaptation to climate change is irregular contact with extension agents.

RECOMMENDATIONS

Efforts should be made by government and relevant stakeholders to educate cassava-based farmers on climate change adaptation strategies along gender lines. Also, land use policy should be revisited to enable farmers have more access to farmland.

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Table 1: Distribution of cassava-based farmers according to their socio-economic characteristics in the study area

Variables	Frequency of Males	Percentage	Frequency of Females	Percentage
Age (years)				
30-40	4	13.30	2	6.60
41-50	9	30.00	10	33.40
51-60	12	40.00	15	50.00
61 -70	5	16.70	3	10.00
Mean	**49**		**52**	
Education Level				
Non-formal Education	5	16.60	9	30.00
Primary	12	40.00	10	33.40
Secondary	9	30.00	8	26.60
Tertiary	4	13.40	3	10.00
Household Size				
1-5	11	36.66	9	30.00
6-10	14	46.68	15	50.00
11-15	5	16.66	6	20.00
Mean	**10**		**8**	
Farm Size (hectares)				
< 2	5	16.60	14	46.66
2-4	9	30.00	8	26.68
5-7	13	43.40	6	20.00
8-10	3	10.00	2	6.66
Mean	**4.45**		**2.83**	
Marital Status				
Single	6	20.00	4	13.40
Married	17	56.60	14	46.60
Divorced	4	13.40	2	6.60
Widowed	3	10.00	10	33.40
Members of Cooperatives				
No	20	66.30	22	73.40
Yes	10	33.40	8	26.60
Farming Experience				
1-10	5	16.60	2	6.60
11-20	9	3.00	10	33.40
21-30	12	40.00	14	46.60
31-40	4	13.40	4	13.40
Mean	**20**		**22**	
Access to Extension Services				
NO	21	70.00	24	80.00

YES	9	30.00	6	20.00
Average Income Level				
50-100	2	6.60	10	33.40
101-150	10	33.40	8	26.60
151-200	12	40.00	9	30.00
>201	6	20.00	3	10.00
Mean	**162**		**133**	

Source: ***Field Survey, 2017***

Table 2: The Distribution of the Cassava-based farmers according to Adaptation Strategies practiced by gender in the study area.

		Male			**Female**		
Adaptation strategies	**N**	**Mean**	**Freq**	**%**	**Mean**	**Freq**	**%**
Change of planting date	60	0.8333	25	83.33	0.8666	26	86.66
Moving to a different site	60	0.9000	27	90.00	0.6333	19	63.33
Mixed cropping	60	0.8000	24	80.00	0.7000	21	70.00
Changing the timing of land preparation	60	0.7000	21	70.00	0.8000	24	80.00
Changing harvesting date	60	0.6333	19	63.33	0.7333	22	73.33
Planting crops with early rainfall	60	0.6333	19	63.33	0.6000	18	60.00
Different crop varieties	60	0.6333	19	63.33	0.4333	13	43.33
Shading and sheltering/tree planting	60	0.5666	17	56.66	0.5000	15	50.00
Use of credits facilities to increase production	60	0.5000	15	50.00	0.2666	8	26.66
Use of early maturing crops varieties	60	0.2666	6	26.66	0.2000	6	20.00
Increase use of irrigation/ground water /watering	60	0.1666	5	16.66	0.2333	7	30.00
Valid N (listwise)	60						

Source: Field survey, 2017
Note: Male respondents = 30; female respondents = 30

Table 3: Distribution of the Cassava-based farmers according to problems encountered by gender in the study area.

Problems	N	Rank	Mean for male	Mean for female	Rank
Irregular extension contact with extension agents	60	1st	3.722	4.511	1st
Lack of access to improve crop varieties	60	2nd	3.533	4.323	2nd
Absence of government policy on climate change	60	3rd	3.321	4.141	5th
Low access to land	60	9th	2.523	4.476	3rd
Limited knowledge on adaptation measures	60	4th	3.224	3.102	9th
Limited access to water supply	60	6th	3.112	3.091	10th
Poor government attention to climate change	60	8th	2.780	2.990	11th
Low awareness level	60	7th	2.661	2.771	12th
No access to credit	60	5th	3.176	4.220	4th
Shortage of labour	60	10th	2.502	3.553	8th
Lack of access to land	60	12th	2.021	3.904	6th
Insufficient	60	11th	2.156	3.887	7th
Valid N (listwise)	60				

Note: male respondents= 30; female respondents =30
Source: Field survey, 2017