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Effects of capacity building on rural women involvement in Climate Smart Agriculture initiatives in Rivers state, Nigeria

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Abstract

The study assessed the effects of capacity building on rural women involvement in Climate Smart Agriculture (CSA) initiative in Rivers State, Nigeria. Respondents were leaders of rural women cooperative societies in Rivers State who were randomly selected from 23 Local Government Areas in the State. Structured questionnaire administration and Key Informant Interview was used to collect data while frequency counts, mean and percentages were employed to analyze the data collected. Results showed that the rural women interviewed were mostly adults, as majority (71.8%) were within the age range of 40 - 59 years. Majority (62.52%) were engaged in business/trading and other non-agricultural income generating activities, such as civil service (21.89%), income from pensions (3.13%), while 12.5% of the respondents had no other income generating activity aside farming. Some (40.63%) of the rural women had Senior Secondary Certificate as the highest form of education. Only 43.75% were aware of CSA, with 62.51% of them indicating low level of CSA knowledge. The major CSA management practices they know include mixed farming (50.0%), crop management practices (40.63%), application of indigenous knowledge and practices (25.0%) and soil management practices (25.0%). Approximately 84% have not attended CSA training before now. All the rural women (100%) used for the study upheld that CSA training is helpful in improving their CSA knowledge, imparted their readiness to adopt CSA practices (94%) and equipped them to be more involved in CSA initiative (100%). The major effects of capacity building on rural women involvement in CSA initiative are better knowledge of CSA for increased use of CSA practices ($\bar{X}$ = 3.72), capacity to add value to their farm products ($\bar{X}$ = 3.69) and capacity to train others on CSA practices ($\bar{X}$ = 3.50). Regular training on CSA components by both government and private agencies could help in strengthening and sustaining rural women active participation in CSA initiative in the state and beyond.

Keywords: capacity strengthening, value addition, rural women, climate smart agriculture



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Introduction

Climate change has had devastating impacts on humans, the environment and most especially agriculture. It has caused significant changes in the size of agricultural production, location, or area of production (Oladipo, 2010). These on a large scale have serious implications on food security and livelihood, especially on rural women (Ogunbameru, 2018). Incidentally, many developing countries do not have the capacity to handle the challenges caused by climate change especially as it affects women and agriculture. However, capacity building will be necessary for improving the productivity of women farmers, agriculture and food production. Fortunately, concerned parties agree to this; Convention of, and Kyoto Protocol of 1997 and in recent times the Paris Agreement of 2015. This is in cognizance of the fact that women's adaptive capacities are often constrained because of their roles in the household and society, institutional barriers and established social norms. These constraints result in low adaptive capacity of women, making them vulnerable to the effects of climate change (Banergee et al, 2019).

Therefore, any intervention to aid adaptation and strengthen capacity of women to climate change would have to take note of the specific realities of women and the diverse limitations they experience. Strengthening women's capabilities can make them formidable agents of social change and enhance the overall climate change coping strategies of society. In the 1979 Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), the need for policy makers to address the specific realities of women was considered paramount, especially for the rural poor. It is necessary therefore to address gender-based inequalities to strengthen women's advantages and access to agricultural credit, marketing facilities and appropriate technologies as well as equality in land and agrarian issues and reforms. A better understanding of women's needs and how climate change impacts on their well-being will require generating gender-differentiated data and must include that which would ensure that women are involved in the discourse and their interest accommodated.

Policies and practices would be required to address the vulnerability of women and also improve their coping capacity (Dube, 2014). The expected policies, coping capacity considerations, and strategies should address the right of women to be involved in all aspects of decision-making such as the design of adaptation strategies; improved access to land, credit and information that supports production and marketing activities; ensure women's inclusion in disaster response systems; address the links between climate change, health, and nutrition as it affects women; broaden women's access to education and other knowledge-generating systems. Climate change issues could be discriminatory in Africa, it is necessary therefore that policymakers ensure that all adaptation initiatives are gender sensitive. This may require carrying all players along through all the stages of conflict adaptation, and creating innovative ways to address specific needs, especially those of rural women and those exposed to harsh impacts of climate change. This is necessary because it will enable them to better understand possible impacts of their decisions and strengthen the integration of gender equality and adaptation (Dube, 2014).

In Nigeria, particularly Rivers State, agriculture remains the main livelihood means for rural women, with approximately one-third of them employed in the sector. Yet women farmers still face marginalization in accessing needed resources like land, information, finance, infrastructure, technologies and markets (UN Women, 2016). Exclusion of rural women impacts their climate change adaptation in

diverse ways, including limitation of access to credit facilities, denial of ownership to land for increased agricultural activities and inadequate access to important agricultural equipment and inputs for better adaptation (Ifeanyi-obi and Ugorji, 2020). Rivers State falls within the Niger Delta zone of Nigeria, a zone highly impacted by the climate-induced environmental risks. This has aggravated the limitations of women and further deepened their poverty level. Climate change often widens and aggravates existing inequalities in the society.

Extreme weather events such as droughts and floods have a greater impact on the poor and the most vulnerable. Despite women being disproportionately affected by climate change, they play a crucial role in climate change adaptation (Verzosa et al. 2021), hence, are key to effective adaptation. This calls for adaptation initiatives that are gender sensitive.

For adaptation to be effective and successful, the needs and interests of women must be paid attention to (Ifeanyi-obi et al, 2022a). Thus, effective climate change adaptation must promote gender equality and correct practices that lead to inequality. A major constraint faced by women in their effort to cope with climate impacts is their poor knowledge and capacity on adaptation strategies. Although several adaptation measures through research and agricultural advisory services are available, women lack the understanding and even the capacity to use those adaptation measures. This also limits their participation in climate change discourse in Nigeria. Ifeanyi-obi et al (2022b) stated that the low representation of women in politics accounts for the absence of gender-sensitive legislation while on the other hand, their low economic empowerment and climate change literacy level limits their adaptive capacity thereby deepening their vulnerability level and further placing them below the poverty line. Building their knowledge and capacity on climate change holds much potential in increasing their use of these adaptive strategies as well as participating in climate change initiatives in the country.

In the face of increasing emphasis on the adoption of Climate Smart Agriculture (CSA) technologies, innovations and management practices, the benefits of these innovative strategies could only be harnessed when significant percentage of the farming population (particularly women) know and use these practices. Climate-Smart Agriculture (CSA) integrates the three dimensions of sustainable development, economic, social and environmental by jointly addressing food security and climate challenges. It is composed of three main pillars namely, sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change, and reducing and/or removing greenhouse gas emissions, where possible (FAO 2013). Ifeanyi-obi, et al (2022c) noted that, though CSA-TIMPs has proved to hold great potential for increasing food production and building farmers' resilience to climate change impact, there is considerably low awareness and knowledge of CSA-TIMPs in Nigeria resulting in low uptake of the CSA practices across the regions. This implies that the potentials of CSA to increase agricultural production and maintain a healthy ecosystem, particularly among rural women, could only be harnessed if their CSA knowledge and capacity are strengthened. It is against this background that this study assessed the effects of capacity building on rural women's involvement in the Climate Smart Agriculture initiative.

The broad objective of this study was to assess the effects of capacity building on rural women's involvement in climate Smart agriculture initiatives in Rivers State. Specifically, the study described the socio-economic characteristics of rural women, determined rural women's awareness and level of awareness of Climate Smart Agricultural (CSA)

practices and determined the effects of capacity building on rural women's involvement in CSA initiatives in Rivers State.

Methodology

The study was carried out in Rivers State. Rivers State lies on the coastal plain of the eastern Niger Delta. Generally, the State is characterized by high rainfall. Rainfall is adequate for all year-round crop production in the State. Wet season lasts for not less than 330 days, of which a great number are rainy days (days with 250 mm or more of rain). The mean annual temperature for the State is 26°C with the hottest months experienced between February and May. The relative humidity is high throughout the year and decreases slightly in the dry season (Overview of Rivers State, nd).

Respondents for this study were leaders of rural women cooperative societies in Rivers State, who participated in the Climate Smart Agriculture training workshop organized in Rivers State in March 2022. A two-stage sampling procedure was employed to select the sample for the study. In the first stage, the list of all the rural women's cooperative societies in the 23 Local Government Areas of Rivers State was accessed from the Rivers State Agricultural Development Programme (ADP). The Rivers State Agricultural Programme is the government arm with the primary mandate of carrying out agricultural advisory services in the state with special focus on rural areas. Based on the records of the Rivers ADP, the most active rural women cooperative society in each Local Government Area was selected for the study giving 23 rural women cooperative societies for the study.

The second stage involve a random selection of one out of the seven leaders in each of the 23 selected rural women cooperative society giving a total of 23 women leaders for the study. In addition, seven key rural women leaders who have made outstanding achievements in working with the Rivers ADP in the past were also selected to make it a total of thirty women leaders. To help triangulate information gotten from the rural women, the state coordinator of Women-In-Agriculture (WIA), state Programme manager, Director of extension services, and three community leaders were interviewed.

A mixed method approach was used in data collection to ensure diverse data were collected that will better explain the variables being studied. Data was collected with the aid of questionnaire administration as well as Key informant interview. The questions in the data collection instrument were structured to ensure they covered all interest areas of the study. Effects of capacity building on rural women's involvement in climate-smart agriculture initiatives were captured using 9 item statements on a four-point Likert-type scale which was assigned weights of 4 (strongly agree), 3 (agree), 2 (disagree) and 1 (strongly disagree) with a midpoint of 2.5. Mean values equal to or greater than 2.5 implies agreement with the statement while mean values of less than 2.5 imply disagreement. Data collected was analyzed using descriptive statistics namely; frequency counts, percentages and mean.

Results and Discussion

Socio-economic characteristics of the rural women

Findings in Table 1 showed that the rural women were mostly adults, as majority (71.8%) were within the age range of 40 to 59 years with mean age of 44 years. This suggests that the respondents were in their economic and productive years and would most likely be interested in factors that affect or improve agricultural productivity. The result agrees with the findings of Opeyemi et al, (2021) who reported that the majority of the farmers within the age range of 40-50 were still in their middle, productive, and possess physical and mental energy

required in understanding and putting to practice CSA in their agricultural activities.

The majority of the rural women indicated they engaged in other non-agricultural income-generating activities such as business/trading (62.52%), civil service (21.89%), pensioners (3.13%), while 12.5% of the respondents had no other income generating activity aside farming. This may result to low uptake of climate change adaptation strategies because some studies (Akwiwu 2018, Ekpa and Oladele, 2018; Adebayo and Ojogu, 2019; Terdoo, 2020) have shown that when people have other alternative means of livelihood to agriculture, they may show lackadaisical attitude towards climate change issues which affect agriculture.

Majority (40.63%) of the rural women indicated they had taken Senior Secondary Certificate Examination (SSCE) and had O level. This level of education of the respondents according to the study of Fawole and Aderinoye-Abdulwahab (2021) is capable of improving farmers' understanding of CSA as the level of education has been known to influence knowledge and productivity in agriculture positively. This is closely followed by respondents (28.14%) with tertiary education (HND/BSc./BED) and 21.88% of the respondents who have only a First School Leaving Certificate.

Knowledge of Climate-Smart Practices by the rural women

Some of the rural women (43.75%) indicated that they have heard of CSA before the training. However, 62.51% of them had low level of CSA knowledge. Responding to the question of which CSA management practices they know, the majority (50.0%) indicated they were conversant with mixed farming, while knowledge of crop management practices was indicated by 40.63% of the respondents. The least in knowledge was the application of indigenous knowledge and practices (25.0%) and soil management practices (25.0%). Mixed farming received an average response as the rural women seem to practice more of it compared to other items listed. The use of mixed farming may be due to the ancient nature of the practice which allows farmers to make maximum use of a piece of farmland for higher productivity as outlined by Adebayo et al, (2021). On attendance to any CSA training before now, the respondents (84%) indicated they have not attended any CSA training before now. This necessitates the need to organize more CSA trainings to improve the knowledge of rural women on CSA. Training provided to farmers would not only help them improve their individual capabilities, farm yield, income, and standard of living but more importantly, boost their morale and motivation in the practice of CSA (Akinyemi et al, 2021).

Rural women leaders' perception of climate smart agriculture training programme

All the rural women (100%) upheld that CSA training is helpful in improving their knowledge on CSA. As regards the frequency of training, the rural women mainly indicated that CSA training should be organized twice a year (37.50%) and quarterly (37.50%). The result further showed that the rural women (93.75%) agree that CSA training influences their readiness to adopt CSA practices as well as equip them to get more involved in CSA practices. CSA training is critical to improving farmers' yields and, in turn, addressing climate change impact, hunger, and poverty in rural Africa as agreed by 100% of the respondents (Ifeanyi-obi et al, 2022). The finding corroborates earlier research which asserted that training helps farmers to build technical skills, learn about best practices, give them somewhere to turn to when they have questions about CSA, and connect them to extension services (Khairul and Kamariah, 2021).

Table 1: Socio-economic characteristics of the rural women

Variables	Frequency	Percentage (%)
Age		
20-39	8	25.00
40-59	23	71.80
50-69	1	3.20
Education		
FSLC	7	21.88
SSCE/O LEVEL	13	40.63
NCE	1	3.13
OND	1	3.13
HND/BSc/Bed	9	28.14
MSc	1	3.13
Other occupation		
None	4	12.50
Business/Trading	20	62.52
Civil Servant	7	21.89
Pensioner	1	3.13

Source: Field survey, 2022**Table 2:** Knowledge of Climate Smart Practices by the Respondents

CSA Awareness and knowledge	Frequency	Percentage (%)
Heard of CSA before now	14	43.75
Level of knowledge on CSA		
VeryLow	19	59.38
Low	1	3.13
Average	9	28.13
High	3	9.38
Knowledge of Climate smart management practices		
Soil management practices	8	25.00
Crop management practices	13	40.63
Farming calendar practices	8	25.00
Water conservation strategies	9	28.13
Pest and disease management strategies	10	31.25
Weed management strategies	12	37.50
Mixed farming	16	50.00
Application of indigenous knowledge and practices	8	25.00
Have you attended any CSA trainingbefore now	5	16.00

Source: Field Survey, 2022**Table 3:** Rural women's perception of CSA training programme

Statements	Frequency	Percentage (%)
CSA training is helpful in improving knowledge on CSA	32	100
Frequency of CSA training		
Once in two years	1	3.13
Annually	7	21.88
Twice a year	12	37.50
Quarterly	12	37.50
CSA training influences my readiness to adopt CSA practices	30	97.75
CSA training equips me to get more involved in CSA discourse	32	100
If yes, to what extent?		
Very little extent	2	6.25
Little extent	1	3.13
High extent	9	28.13
Very high extent	20	62.50

Source: field survey, 2022

Table 4: Effects of capacity building on rural women's involvement in Climate-Smart Agriculture initiatives in Rivers state

Statements	SD	D	A	SA	Mean
Better Knowledge of CSA practices for increased and better involvement in CSA initiatives	0(0)	0(0)	9(28.1)	23(71.9)	3.72*
Links to improved varieties will help me access them more readily	2(6.26)	1(3.1)	17(53.1)	12(37.5)	3.19*
Equips me to train others on CSA	1(3.1)	0(0)	13(40.6)	18(56.2)	3.50*
Enhances my capacity to add value to my farm products	1(3.1)	0(0)	7(21.9)	24(75.0)	3.69*
Equips me to leverage on potential of cooperative as insurance to combat climate change effects	0(0)	2(6.26)	15(46.9)	15(46.9)	3.34*
Upgrade CSA knowledge of other co-operators	0(0)	1(3.1)	17(53.1)	14(43.8)	3.40*
Increased network for timely climate smart information and knowledge sharing	3(9.3)	1(3.1)	18(56.2)	10(31.2)	3.03*
Equips me to contribute meaningfully to climate change discourse in the country	0(0)	0(0)	17(53.1)	15(46.9)	3.47*
Access to experts in climate change research for regular update of my CSA knowledge	0(0)	0(0)	16(50.0)	16(50.0)	3.50*

Source: Field survey, 2022

*Agreement with the statement; ** Disagreement with the statement

Effects of capacity building on rural women's involvement in Climate-Smart Agriculture initiatives

Table 4 showed that the major effects of capacity building on rural women's involvement in climate-smart agriculture initiatives in Rivers State were better knowledge of CSA practices for increased and better involvement in CSA initiatives ($\bar{X}=3.72$), ability to add value to farm products ($\bar{X}= 3.69$), access to experts in climate change research for regular update of my CSA knowledge ($\bar{X} = 3.50$) and enhances their ability to train others ($\bar{X} = 3.50$). This implies that CSA training for rural women would not only enlighten them but would also have a snowball effect on other farmers. They further indicated that CSA training equipped them to meaningfully contribute to climate change discourse in the country ($\bar{X} = 3.47$) as well as upgrade the CSA knowledge of other cooperators ($\bar{X} = 3.40$)

Training for farmers has been proven to yield a variety of results. Murshed and Diemuth (2011); Issahaku and Abdulai (2020) asserted that building the capacity of farmers in CSA through training first is more valuable than the provision of financial support. Similarly, a study by Abegunde, Sibanda and Obi (2020) confirmed that training can contribute to the enhancement of farmers' technical skills in CSA practices.

Finally, training had a positive impact on the respondents and should be replicated among other farmers for increased impact and adoption of CSA practices.

Conclusion and Recommendations

Climate change is not gender-neutral. Women are more exposed and vulnerable to climate change due to their low access to information and resources, poor education, and low income compared to men. Their needs and interest must be addressed for adaptation efforts to be successful. There is a need for policies and practices that should address the vulnerability of women in climate change-related issues and improve their coping capacity. This will help build their capacity to overcome constraining factors heightened by their roles in the household, institutional and social norms. This study concludes that capacity building is key to strengthening rural women's adaptive capacity as well as improving their involvement in Climate-smart agriculture initiative. It posits that women's participation in climate change discourse is important in ensuring gender-responsive adaptation policies and practices are developed.

Based on the findings of the study, the following recommendations were made: It is important for researchers to produce gender-disaggregated data

in climate change research. This will give clearer and deeper insight to policymakers on the gender-specific impacts of climate change, hence, developing appropriate capacity strengthening programmes.

Donor organizations should consider women-specific circumstances when introducing climate smart technologies. This will help to ensure that the technologies are adopted by women.

CSA Capacity building for rural women should not be a one-off event. Climate change is dynamic with new challenges emerging on regular basis, hence, the need for regular CSA capacity building to ensure their knowledge is updated.

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Conflict of interest

The authors declare no conflict of interest with respect to the research and publication of this article

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