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AWARENESS OF CLIMATE CHANGE MITIGATION STRATEGIES AND ACHIEVABILITY OF SUSTAINABLE DEVELOPMENT GOAL AMONG FARMERS IN CROSS RIVER STATE EDUCATION ZONE

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Abstract

This study investigates the relationship of farmer awareness of climate change mitigation strategies on the achievability of Sustainable Development Goal one (No poverty) in Cross River State Educational zone. Two research questions were posed and two null hypotheses were formulated to guide the study. The results were tested at 0.5 level of significance. The population of the study is 114,000 registered farmers and a sample of size of 389 was chosen using the Taro Yamani formular. The instrument for data collection was a structured questionnaire with 10 items. Purposive and stratified random sampling techniques were employed to select farmers across local government areas. A four point Likert scale was used to gather responses, and Pearson product moment correlation was applied to analyze data. The results indicate that farmers' educational level and access to climate change information significantly influence their awareness of climate change mitigation strategies and the achievability of SDG 1. Moreover, notable differences in climate change awareness level were observed across the three education zones. It was recommended among others that the government should enhance educational initiatives and access to climate change information to increase awareness among farmers, and to increase intervention in the area of monitoring the effectiveness of these strategies in promoting SDG1.

Keywords: Awareness, Climate Change, Mitigation strategies and Achievability of sustainable development.

1.0 Introduction

Climate change presents profound challenges to global sustainability initiatives, impacting on diverse sectors such as agriculture, essential for achieving Sustainable Development Goal (SDG) one – which says, No poverty. SDG one seek to eliminate extreme poverty and hunger by 2030 through sustainable farming practices and improved productivity (United Nations, 2015). In Nigeria, particularly, in Cross River State Wducation Zone, agriculture is central to the

economy but confronts escalating vulnerabilities due to climate change effects such as irregular rainfall, temperature variations, and extreme weather occurrences (Nigeria climate change policy response strategy, 2012). These environmental shifts threaten agricultural stability, jeopardizing food security and economic resilience in the region.

Addressing these challenges requires concreted efforts to implement climate resilient agricultural strategies, enhance adaptive capacities, and integrate sustainable practices into local farming systems. By mitigating climate risk and fostering agricultural sustainability, stakeholders can safeguard livelihoods, alleviate poverty and advance progress towards global development goals in regions like Cross River State Education Zone.

Farmers in this zone are particularly vulnerable to the adverse effects of climate change, posing significant threats to both food security and livelihoods.

Implementing effective mitigation strategies is crucial for adapting to these challenges and achieving sustainable development goals. It is essential to understand farmers' levels of awareness, their perceptions of climate change, and the factors that influence their adoption of climate smart agricultural practices. This understanding will inform policy interventions aimed at enhancing sustainable development outcomes, as highlighted by the intergovernmental panel on climate change (IPCC, 2014). Understanding sustainable farming practices is crucial for achieving SDG 1, as sustainable agriculture not only increases yields but also conserves natural resources and mitigates environmental degradation (Anukwonke, 2021).

Educational attainment among farmers in Cross River State varies widely, with some farmers having access to formal education while others rely on traditional knowledge passed down through generations. Formal education equips farmers with scientific knowledge and modern techniques that can enhance agricultural productivity and sustainability.

Despite the importance of education; challenges such as limited access to quality education, adequate infrastructure and socioeconomic disparities hinder educational opportunities for many farmers in Cross River State.

Access to information is widely recognized as a critical factor in advancing sustainable Development Goal 1 (SDG1) among farmers, particularly in developing regions where agriculture forms the backbone of livelihoods. SDG 1, as outlined by the United nations (2015), aims to eradicate extreme poverty and hunger by ensuring universal access to social protection system and promoting stainable agricultural practices. Central to achieving these goals is the empowerment of farmers through access to timely and relevant information. Timely access to information enhance farmer knowledge of sustainable farming techniques, market trends, and available governmental support programs. This knowledge, in turn, equips farmers with the tools to improve productivity and increase their income levels (United Nations, 2015; World Bank, 2020). For instance, understanding sustainable practices not only improves crop yield but also promotes

environmental stewardship, which is crucial for long term agricultural viability in resource constrained regions.

Access to educational resources plays a crucial role in achieving Sustainable Development Goals 1 (SDG1) which aims to end poverty in all its forms, everywhere. This goal is particularly challenge for farmers in developing countries, where limited access to education hinders economic progress and food security (United States, 2020). Educational resources encompass a broad spectrum, including formal education, vocational training, and access to information and technology.

Reliable climate information is crucial for understanding the local climate conditions that significantly impact the achievability of Sustainable Development Goal 1 (SDG 1) among farmers. Extreme weather events, exacerbated by climate change; pose additional risk to agricultural production, making it harder for farmers to escape poverty without adaptive strategies and support systems (IPCC, 2021).

It is on this basis, this study seeks to investigate the awareness of climate change mitigation strategies among farmers in Cross River State Education zone and access their perceptions of the achievability of SDG one through sustainable agricultural practices.

2.0 Methodology

The design employed in conducting this study is survey research design. The design was considered appropriate because is the methodology and framework utilized for gathering data via survey to explore a specific research inquiry or hypothesis. This approach encompasses the strategizing, structuring and execution of surveys to procure information from a subset of individuals or groups within a given population. The adoption of the survey research design is grounded in its potential to provide statistical data on awareness levels and their correlation with famers perception of achievement of SDG1. The design facilitates the acquisition of quantitative data from a considerable number of participants, enabling researchers to extrapolate the findings to a wider population.

The study is conducted in Cross River State Educational Zone, Nigeria which is a coastal state located in the South-South geopolitical zone of the country. The study population consist of registered farmers in the target zone, the population is 114,000 and it was used for the study. The study adopted a purposive and stratified random sampling techniques.

Two research questions were raised to guide the study:

i. To what extent does farmers level of education relate with their awareness of climate change mitigation strategies and the achievability of SDG1.
ii. How does access to climate change information relate with farmers' awareness of climate change mitigation strategies and their support for SDG 1.

Two statements of hypotheses were formulated to guide this study:

i. Farmers' level of education has no significant relationship with their awareness of climate change mitigation strategies and the achievability of SDG 1.
ii. Access to climate information does not significantly relate with farmers'

awareness of climate change mitigation strategies and the achievability of SDG 1.

The questionnaire was the instrument used for data collection for the study. The researcher first introduced themselves to the respondents and informed them of the exercise and the essence of giving objective responses to the items.

The respondents were advised to be honest in their responses to the item as the information obtained will be treated with all amount of confidentiality. Hypotheses were tested by the statistical tool employed. Data was analyzed using Pearson product moment correlation analysis.

The results show that there is no significant relationship of farmer level of education, access to climate change information and the achievability of SDG-1.

2.1 Instrument

Data was collected using a structured questionnaire, titled questionnaire on awareness of climate change mitigation strategies and achievability of Sustainable Development Goal-1 among farmers in Cross River Education Zone, Nigeria. It contains 10 items and organized into three sections.

2.2 Results

The results of the study are presented, hypothesis by hypothesis. Each hypothesis was tested at 0.05 level of significance.

Hypothesis one:

To what extent does farmer level of education relate with their awareness of climate change mitigation strategies and the achievability of SDG 1.

Table 1: Pearson product moment correlation analysis of the relationship between farmer level of education and their awareness of climate change mitigation strategies and the achievability of SDG where N = 387

Variable	$\bar{X}$	SD	r-cal	p-value
Farmer level of education	16.91	1.89		
			451**	.000
Farmer awareness of climate change mitigation strategies and achievability off SDG 1	37.83	1.74		

*significant at .05 level, df = 387

The results in the table above reveal that a significant positive correlation between the effectiveness of integration of technology (m=16.91, SD= 1.89) and the perception of environmental safety (m=37.83, SD = 1.74) r = (389) = 451*, P=.000 where positive correlation r=0.451 suggests that as the farmer level of education increases, their awareness of climate change mitigation strategies and the achievability of SDG1 also tend to increase and the statistical significance (P <.05) confirms that this relationship is unlikely to be due to random chance, making it a reliable finding.

The analysis also suggests that higher education levels among farmers are associated with greater awareness of climate change mitigation strategies and a better perceived achievability of SDG1.

Hypothesis two

How does access to climate change information relate with farmers' awareness of climate change mitigation strategies and their support to SDG 1.

Table 2: Pearson product moment correlation analysis of the relationship between access to climate change information with farmers' awareness of climate change mitigation strategies and the achievability of SDG 1 (N = 389)

Variable	$\bar{X}$	SD	r-cal	p-value
Access to climate change information	16.93	1.38		
			207**	.000
Farmers awareness of climate change mitigation strategies and achievability off SDG 1	37.83	1.74		

*Significant at .05 level, df = 387

The results from table 2 revealed that a significant positive correlation between access to climate change information (m=16.93, SD=1.38) and farmer awareness of climate change mitigation strategies and the achievability of SDG 1 (m=37.83, SD=1.74) r(387) = 207; P < .005 is significant at the 0.5 level of significance, where (df) = 387.

3.0 Discussion of findings

The discussion of the findings of this study is presented, again, hypothesis by hypothesis

The finding from the first hypothesis suggest that farmers level of education has no significant relationship with their awareness of climate change mitigation strategies and the achievability of SDG 1. The positive correlation suggests that the as the farmers' level of education increases, their awareness of climate change mitigation strategies and the achievability of SDG 1 also tend to increase. The finding supports the conclusion of Fahad et al (2020) who assessed climate change awareness among Pakistani farm households using a structured questionnaire with 400 participants across four districts in Khyber Palchjunkhwa. Stratified random sampling technique was applied and probit model evaluated the influence of socio-economic and demographic factors on awareness. The findings revealed that 73% of farm households were aware of climate change.

Also the study corroborates those of mugambiwa and Tirivangasi (2017) who examined the impact of climate change on achieving Sustainable Development Goals (SDG 2) in South Africa. The study highlighted the adverse effects of climate change on agriculture, food security, and poverty reduction, particularly in sub Saharan Africa.

The findings from hypothesis two suggests that better access to climate change information is linked to famers' educational level, which may help achieve SDG 1. This aligns with Agwu and Anugwa's (2016) study on rural farmers in Enugu state, Nigeria. Their findings revealed that while all respondents were aware of climate change, they needed more knowledge on key issues. Significant factors that influence their climate change knowledge include: formal education, social organization membership and access to credit.

Similarly, the findings agree with Magers et al (2023) who viewed 66 studies on adaptation measures by African smallholder farmers. Common strategies include crop diversification planting drought tolerant varieties, and changing planting dates. However, more transformative changes, such as improved irrigation and crop insurance, may be needed to address future climate challenges and achieve SDG 1.

4.0 Conclusion

This study concludes that farmers' awareness of climate change mitigation strategies and the achievability of sustainable development Goal 1(SDG1) are strongly influenced by their level of education and access to climate change information, but do not significantly affect their awareness or the achievability of SDG 1. The findings also revealed that disparities in awareness levels across different education zone in Cross River Education Zone, highlighted the need for targeted educational interventions to ensure equitable access to climate change knowledge and resources across the region.

Recommendation

Based on the findings of this study; the following recommendations are made:

i. **Enhanced educational programs:** Educational initiative should be intensified to improve farmers understanding of climate change causes and mitigation strategies.

ii. **Increased access to climate change information:** Government agencies, NGOs and agricultural organizations should ensure that accurate and relevant climate change information is readily available to farmers.

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