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Educational Attainment, Climate Change Information Access, and Awareness of Mitigation Strategies for Achieving SDG 1 Among Farmers in Cross River State, Nigeria

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Abstract:
This study examines the relationship between farmers' level of education, access to climate change information, and their awareness of climate change mitigation strategies in achieving Sustainable Development Goal 1 (SDG 1) in Cross River State, Nigeria. A survey research design was employed, with a structured questionnaire used to collect data from a sample of 389 registered farmers. Participants were selected using purposive and stratified random sampling techniques across three educational zones. Data analysis was conducted using the Pearson Product Moment Correlation. Findings revealed a significant positive correlation between farmers' level of education and their awareness of climate change mitigation strategies, suggesting that higher educational attainment enhances understanding of climate adaptation measures. Similarly, access to climate change information was positively associated with awareness of mitigation strategies, reinforcing the importance of information dissemination in agricultural communities. These findings highlight the need for targeted educational programs and improved access to climate information to enhance farmers' capacity for climate resilience and sustainable development. The study recommends strengthening agricultural extension services and integrating climate education into rural development initiatives to promote informed decision-making and poverty alleviation.
Key words: climate change mitigation, sustainable development goal 1 (SDG 1), farmers' education, access to climate information, and agricultural sustainability.

Introduction and background

Climate change poses significant challenges to global sustainability, particularly in agriculture, which is crucial for achieving Sustainable Development Goal (SDG) 1—No Poverty. In Cross River State, Nigeria, agriculture drives the economy but faces growing threats from irregular rainfall, temperature fluctuations, and extreme weather (Nigeria Climate Change Policy Response Strategy, 2012). These changes jeopardize food security and economic stability, necessitating climate-resilient strategies and sustainable farming practices to mitigate risks and support livelihoods.

Farmers in Cross River State remain vulnerable due to limited awareness and adoption of climate-smart agriculture. Research on their perceptions and adaptation strategies is essential for informing policies that enhance resilience (IPCC, 2014). Education plays a vital role, as farmers with formal training are better equipped to implement sustainable practices that boost productivity and environmental conservation (Anabaraonye, Okafor, Ewa, & Anukwonke, 2021). However, disparities in educational access hinder widespread adoption, requiring targeted interventions such as agricultural training and extension services.

Access to timely information is equally critical for poverty reduction and food security. Knowledge of sustainable techniques, market trends, and government support enables farmers to improve yields and income (United Nations, 2015; World Bank, 2020). However, rural areas often face barriers like inadequate infrastructure and poor internet connectivity, limiting information dissemination. Addressing these challenges through mobile-based platforms, community radio, and capacity-building programs can empower farmers and support sustainable development. Collaborative efforts from governments, international organizations, and local stakeholders are crucial to bridging these gaps and achieving SDG 1 in Cross River State and beyond.

The importance of awareness and education on climate change mitigation must be considered. Educating farmers on the potential impacts of climate change and the strategies they can employ to mitigate these impacts is essential for building resilient agricultural systems. Adaptive measures, such as diversifying crops, adopting sustainable farming practices, and utilizing early warning systems, can significantly enhance the capacity of farmers to cope with climate-related challenges. However, there remains to be a gap in understanding how well-informed farmers in this region are about these strategies and the extent to which this knowledge is applied in their daily agricultural practices.

This study aims to fill this gap by assessing the awareness levels of climate change mitigation strategies among farmers in Cross River State and evaluating the potential impact on achieving SDG 1. Through surveys and interviews with local farmers, the study will gather data on the current level of awareness, the types of strategies being implemented, and the perceived effectiveness of these measures. By understanding the relationship between awareness and practical implementation, this research hopes to contribute to the development of targeted interventions that can enhance the resilience of agricultural communities and support the broader goal of poverty eradication in the region.

Statement of the problem

Climate change poses significant threats to agricultural productivity, which is critical to the livelihoods of farmers, particularly in developing regions like Cross River State, Nigeria. Farmers' awareness and implementation of climate change mitigation strategies are crucial for achieving Sustainable Development Goal (SDG) 1, which aims to end poverty in all its forms everywhere (United Nations, 2015). Despite the importance of these strategies, there needs to be more research on the extent of farmers' awareness and the effectiveness of these measures in achieving SDG 1 in Cross River State. Previous studies have highlighted the vulnerability of agricultural communities to climate change impacts and the necessity of adaptive measures to ensure food security and poverty reduction (Intergovernmental Panel on Climate Change [IPCC], 2014).

Agriculture in Cross River State, as in many other parts of Nigeria, is heavily dependent on natural climatic conditions. Unpredictable weather patterns, increased frequency of extreme weather events, and shifting rainfall seasons are some of the adverse effects of climate change that threaten agricultural productivity. These changes can lead to reduced crop yields, loss of livestock, and increased incidence of pests and diseases, all of which exacerbate the economic hardships faced by farmers. As a result, the livelihoods of these farmers are increasingly at risk, and implementing effective climate change mitigation strategies is a necessity.

Farmers' Education, Climate Change Awareness, and the Achievability of SDG 1

Education plays a crucial role in enhancing farmers' awareness and adoption of climate change mitigation strategies. Research suggests that educated farmers are more likely to implement sustainable practices such as crop diversification, conservation tillage, and improved seed varieties, contributing to agricultural resilience and reduced greenhouse gas emissions (Asfaw et al., 2016).

Sustainable Development Goal 1 (SDG 1) aims to eradicate poverty by enhancing the productivity and income of small-scale farmers (United Nations, 2015). Education empowers farmers to adopt climate-smart agricultural techniques, fostering sustainability and improving livelihoods. However, poverty reduction is influenced by multiple factors, including access to resources, extension services, and supportive policies (Food and Agriculture Organization [FAO], 2017).

A study by Fahad et al. (2020) on Pakistani farm households found that 73% of respondents were aware of climate change, with education, farm size, and access to extension services being key determinants. Similarly, Sorvali et al. (2021) surveyed Finnish farmers and observed that

while most acknowledged climate change, beliefs about its causes varied, highlighting the need for targeted climate education.

In Nigeria, research by Okoro, Agwu, and Anugwa (2016) revealed that while farmers were aware of climate change, they lacked comprehensive knowledge of adaptation strategies. Major barriers included inadequate extension services and limited access to credit. To bridge this gap, policymakers should invest in participatory climate education and ensure information dissemination through accessible channels.

Access to Climate Change Information and Farmers' Awareness

Climate change awareness is shaped by education, access to information, and local environmental conditions. Studies indicate that while farmers recognize climate change, misconceptions persist, limiting the adoption of mitigation strategies (Mase et al., 2015). Effective approaches include conservation tillage, agroforestry, and improved water management (Smith et al., 2014).

Magesa et al. (2023) categorized adaptation strategies among African farmers, with crop diversification and drought-tolerant crops being the most common. However, achieving long-term resilience requires transformative changes, such as irrigation infrastructure, crop insurance, and alternative livelihoods.

In Zamfara State, Nigeria, Chukwuji et al. (2019) found that climate information significantly influenced farmers' decision-making regarding planting schedules and crop selection. Challenges such as deforestation, reduced rainfall, and pest infestations underscored the urgency of integrating climate adaptation into agricultural policies. Increased awareness campaigns and enhanced budgetary allocations for agriculture were recommended to strengthen farmers' resilience.

Climate change poses significant threats to smallholder farmers, necessitating a combination of education, access to information, and policy support. Strengthening extension services and improving rural infrastructure can enhance awareness and the adoption of climate-smart practices. These measures are critical for achieving SDG 1 and ensuring long-term agricultural sustainability.

Purpose of the study

The main purpose of this study is to investigate the influence of awareness of climate change mitigation strategies on the achievability of Sustainable Development Goal One among farmers in Cross River State, Nigeria. Specifically, the study seeks to:

1. Examine the relationship between Education Level of Farmers with their awareness of climate change mitigation strategies and the achievability of SDG 1
2. Investigate the relationship between access to climate change Information with farmers' awareness of climate change mitigation strategies and the achievability of SDG 1.

Statement of Hypotheses

The following hypotheses are formulated to guide this study:

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

Methodology

Research design

This study will employ a survey research design, denoting the methodology and framework utilized for gathering data via surveys 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 farmers perceptions of achievements of SDG 1. This design facilitates the acquisition of quantitative data from a considerable number of participants, enabling researchers to extrapolate findings to wider populations.

Area of study

The study is conducted in Cross River State, Nigeria, which is a coastal state located in the South South geopolitical zone of the country. It shares its eastern border with Cameroon. The current Cross River State was established following the division of the old Cross River State into Akwa Ibom and Cross River States. The state is divided into three Senatorial Zones: Northern, Central, and Southern, and comprises 18 Local Government Areas (LGAs). It covers approximately 23,074 square kilometers. To the north, it is bordered by Benue State; to the south, by the Atlantic Ocean; to the west, by Akwa Ibom and Abia States; to the northwest, by Ebonyi State; and to the east, by the Republic of Cameroon. Cross River State is situated between latitudes 5.32° and 4.27° north of the equator and longitudes 2.20° and 7.50° east of

the Greenwich Meridian. As of 2023, it had a projected population of 3,877,800 (National Bureau of Statistics, 2023).

The state is home to three major ethnic groups: The Efik, Ejagham, and Bekwarra. Cross River State is situated in the tropical rainfall belt, characterized by seasonal and occasionally heavy rainfall. The climate is predominantly humid tropical with annual rainfall ranging from 1,300 to 3,000 mm and mean temperatures around 30°C, except on the Obudu Plateau, which experiences a sub-temperate climate with temperatures between 15°C and 23°C. The vegetation includes mangrove swamps, rainforest, derived savannah, and montane parkland. The state's diverse geology reflects its mineral resource potential. Key agricultural products include yams, cassava, rice, and maize. The coastal areas support deep-sea fishing and shrimping. Major exports from the state include palm oil and kernels, timber, cocoa, and rubber, with Calabar serving as a significant seaport. Local industries produce cement, palm oil, asbestos roofing sheets and pipes, and baking flour. Inland transport is primarily via rivers. The majority of Cross Riverians engage in subsistence farming, with a smaller proportion involved in business activities.

The dependence on agriculture in Cross River State often leads to internal conflicts among communities within the same Local Government Areas (LGAs). For instance, there are tensions between Ochon and Oyadama in Obubra LGA, Ebom and Ebijakara in Abi LGA, and also between Ikom and Obubra, Yakurr and Biase. Additionally, there are border disputes with neighboring states such as Ebonyi, Benue, Abia, and Akwa Ibom, as well as international conflicts, including the Bakassi Peninsula dispute and Danare boundary issues with the Republic of Cameroon.

The state covers a total area of 21,019 km², with a population density of 209.6 per km² as of 2023, and an annual population growth rate of 2.7% from 2006 to 2023 (National Population Commission of Nigeria, n.d.; National Bureau of Statistics, n.d.). Cross River State is home to 281 public secondary schools distributed across its 18 LGAs. It also hosts several public tertiary institutions, including the University of Calabar, University of Cross River State, Cross River State College of Education in Akamkpa, Federal College of Education in Obudu, Institute of Management Technology in Yakurr, and Federal Polytechnic Ugep.

The state is renowned for its ecotourism attractions, such as Tinapa, Calabar International Convention Centre, Marina Resort, and Calabar Garment Factory in Calabar Metropolis; Agbokim Waterfalls in Etung; Kwafalls in Aningeje, Akamkpa LGA; Becheve Nature Reserve

in Obudu; Ikom Monoliths in Ikom; Drill Monkey Ranch in Calabar and Boki; Cross River National Park in Akamkpa; Afi Mountain Sanctuary in Boki; Ikang Beach in Calabar; and Obudu Cattle Ranch in Obudu. Environmental agencies operating in the state include the Cross River State Environmental Protection Agency (CREPA), Wildlife Conservation Society of Nigeria (WCS), and Nigerian Conservation Foundation (NCF). The WCS focuses its conservation efforts on the Okwangwo and Oban divisions of Cross River National Park (CRNP). Cross River State is divided into three educational zones: Calabar, Ikom, and Ogoja. Figure 1 illustrates the study area within Cross River State.

Population of the study

The study targets the total number of registered farmers with the Cross-River State Agricultural Development Programme, which was 114,000 as of 2022 (Cross River Agricultural Development Programme, 2023).

Sampling techniques

Purposive and stratified random sampling techniques was employed to select the sample for this study. Initially, farmers were registered by Local Government Areas (LGAs) and wards. From these, 33.3% of the 18 LGAs were purposively sampled, with two LGAs selected per senatorial district. Subsequently, the Taro Yamani formula was applied to determine the sample size. Within each sampled LGA, 5% of farmers were selected from ten wards, as well as 5% from each LGA overall. For sample distribution, the addresses of farmers in each LGA were recorded, and serial numbers from each register were written on slips of paper, which were then placed in a bucket. A research assistant randomly drew slips with replacement until the required number of samples per LGA was achieved. Using these addresses, the researchers and their assistants distributed the questionnaires to the selected farmers. A total sample of 389 respondents was used for the study.

Instrumentation

Data was collected using a structured questionnaire. This questionnaire, titled "Questionnaire on Awareness of Climate Change Mitigation Strategies and Achievability of Sustainable Development Goal One among Farmers in Cross River State, Nigeria," is organized into three sections: Section A gathers respondents' personal information, while Section B includes ten items that assess awareness of climate change mitigation strategies and section “C” asked eleven questions on and achievability of sustainable development goal one among farmers that relate to the variables under discussion.

Validity of the instrument

A preliminary version of the instrument was reviewed by the supervisor and two experts in Measurement and Evaluation from the Faculty of Education at the University of Calabar to assess face and content validity. Based on their feedback, some items were removed and others were adjusted to fit the study's needs. Out of the 55 items initially created, 42 were retained in their revised form, while 13 were discarded due to issues of irrelevance and ambiguity.

Reliability of the Instrument

To evaluate the reliability of the instruments, the Cronbach alpha method was employed. The tool was administered to 40 students' farmers from the College of Agriculture and Forestry Ovonum, who were not part of the study's sample schools. After collecting the completed instruments, the responses were coded and analyzed using the Cronbach alpha reliability scale. The resulting reliability coefficients ranged from .77 to .88, demonstrating that the instrument consistently measured what it was designed to measure.

The questionnaire was distributed across the sampled communities. Respondents were briefed on the purpose of the questionnaire and the importance of providing honest and objective answers. They were assured that their responses will be kept confidential and used solely for research purposes. The questionnaire was administered with the assistance of three research assistants. The research assistants were trained and each one administered in one education zone each. The duration for the administration and collection of the instrument was one week. A four-point Likert type of questionnaire ranging from strongly agreed to strongly disagree was adopted for the responses of the questionnaire. All scoring was carried out with the use of the following keys: SD - Representing strongly disagreed = 1 point, D - Representing disagreed = 2 points, A - Representing agreed. = 3 points, SA - Representing strongly agreed. = 4 points. However, the coding was reversed for negatively worded items.

Presentation of results

Ho_1

Farmers' level of education has no significant relationship with their awareness of climate change mitigation strategies and the achievability of SDG 1. The two variables in this hypothesis were Farmers' level of education and awareness of climate change mitigation strategies and the achievability of SDG 1. Both variables were measured continuously. To test this hypothesis, Pearson product moment correlation analysis was used.

A Pearson Product Moment Correlation was conducted to examine the relationship between Farmers' level of education and their awareness of climate change mitigation strategies and the achievability of SDG 1 (N=389). The analysis revealed 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. The positive correlation (r = 0.451) suggests that 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 statistical significance (p < .05) confirms that this relationship is unlikely to be due to random chance, making it a reliable finding. Overall, the analysis suggests that higher education levels among farmers are associated with greater awareness of climate change mitigation strategies and a better perceived achievability of SDG 1. The result of analysis as presented in Table 1.

Table 1: Pearson Product Moment Correlation analysis of the relationship between Farmers' level of education and their awareness of climate change mitigation strategies and the achievability of SDG 1 (N=389)

Variables	$\bar{x}$	**SD**	**r-cal**	**p-value**
Farmer Level of Education	16.91	1.89	.451**	.000
Farmers Awareness of climate change mitigation strategies and Achievability of SDG1	37.83	1.74		

* Significant at .05 level, df=387.

Ho_2

Access to climate change information does not significantly relate with farmers' awareness of climate change mitigation strategies and the achievability of SDG 1. The two variables in this hypothesis were access to climate change information and farmers' awareness of climate change mitigation strategies and the achievability of SDG 1 in Cross River State, Nigeria. Both variables were measured continuously. To test this hypothesis, Pearson product moment correlation analysis was used. The result is presented in table 2.

The relationship between access to climate change information and farmers' awareness of climate change mitigation strategies, as well as the achievability of SDG 1, was examined using Pearson's correlation. The analysis involved 389 participants. Results indicated a significant positive correlation between access to climate change information (M = 16.93, SD = 1.38) and farmers' awareness of climate change mitigation strategies and the achievability of SDG 1 (M = 37.83, SD = 1.74), r (387) = .207, p < .005. The correlation is significant at the .05 level, with degrees of freedom (df) = 387.

Given that the p-value is greater than the .05 significance level, the null hypothesis that Access to climate change information does not significantly relate with farmers' awareness of climate change mitigation strategies and the achievability of SDG 1 was rejected. This suggests that greater access to climate change information is associated with higher awareness of mitigation strategies among farmers, which may contribute to the achievability of 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)

Variables	$\bar{x}$	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 of SDG1	37.83	1.74		

* Significant at .05 level, df=387.

Discussion of findings

Farmers' level of education and farmers awareness of climate change mitigation strategies and Achievability of SDG1

The findings 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 analysis revealed a significant positive correlation. The positive correlation suggests that 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 by 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 Pakhtunkhwa. A stratified random sampling technique was applied, and a probit model evaluated the influence of socioeconomic and demographic factors on awareness. The findings revealed that 73% of farm households were aware of climate change. Factors such as age, education, agricultural experience, land ownership, and access to information significantly influenced this awareness. Additionally, the study found that farm households actively employed adaptation strategies like crop diversification and irrigation.

Similarly, the study corroborates those of Mugambiwa and Tirivangasi (2017) who examined the impact of climate change on achieving Sustainable Development Goal 2 (SDG 2) in South Africa. Using an exploratory design, snowball sampling, and discourse analysis, the study highlighted the adverse effects of climate change on agriculture, food security, and poverty reduction, particularly in sub-Saharan Africa. The research concluded that climate change poses significant challenges to achieving SDG 2 and exacerbates the vulnerabilities of impoverished communities.

Access to climate change information does not significantly relate with farmers' awareness of climate change mitigation strategies and the achievability of SDG 1.

The analysis of hypothesis two suggests that better access to climate change information is linked to increased awareness of mitigation strategies among farmers, which may help achieve SDG 1. This aligns with Agwu and Anugwa's (2016) study on rural farmers in Enugu State, Nigeria. Using a multistage sampling process, they gathered data from 152 respondents through structured interviews. The findings revealed that while all respondents were aware of climate change, they needed more knowledge on key issues. Significant factors influencing their climate change knowledge included formal education, social organization membership, and access to credit. Farmers expressed a need for information on improved crop varieties, occupational diversification, and farm operation timing. Poor extension services and infrastructure were major barriers. The study recommended empowering extension agents to educate farmers on climate change in accessible languages and through participatory methods. Similarly, the finding agrees with Magesa et al. (2023) who reviewed 66 studies on adaptation measures by African smallholder farmers. Common strategies included 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 SDGs 1 and 2.

Conclusion and recommendation

This study concludes that farmers' awareness of climate change mitigation strategies and the achievability of Sustainable Development Goal 1 (SDG 1) are strongly influenced by their level of education, access to climate change information.

Based on the findings of this study, the following recommendations are proposed:

1. Enhance Educational Programs: Educational initiatives should be intensified to improve farmers' understanding of climate change causes and mitigation strategies. This could include integrating climate change education into agricultural training programs and offering workshops or extension services focused on sustainable farming practices.
2. Increase Access to Climate Change Information: Government agencies, NGOs, and agricultural organizations should work to ensure that accurate and relevant climate change

information is readily available to farmers. This could be achieved through the use of mobile technology, radio broadcasts, and community outreach programs, especially in underserved areas.

References

Anabaraonye, B., Okafor, J. C., Ewa, B. O., & Anukwonke, C. C. (2021). The impacts of climate change on soil fertility in Nigeria. Climate Change and the Microbiome: Sustenance of the Ecosphere, 607-621.

Asfaw, S., McCarthy, N., Lipper, L., Arslan, A., & Cattaneo, A. (2016). Climate variability, adaptation strategies and food security in rural Tanzania. FAO Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) Programme.

Chukwuji, C. N., Tsafe, A. G., Sayudi, S., Yusuf, Z., & Zakariya, J. A. (2019). Awareness, access and utilization of information on climate change by farmers in Zamfara State, Nigeria. Library Philosophy and Practice (e-journal), 2106.

Fahad, S., Inayat, T., Wang, J., Dong, L., Hu, G., Khan, S., & Khan, A. (2020). Farmers' awareness level and their perceptions of climate change: A case of Khyber Pakhtunkhwa province, Pakistan. Land use policy, 96, 104669.

Federal Ministry of Environment, Nigeria. (2012). Nigeria climate change policy response strategy. Government of Nigeria.

Food and Agriculture Organization (FAO). (2017). The future of food and agriculture: Trends and challenges. FAO. https://www.fao.org/publications

Intergovernmental Panel on Climate Change (IPCC). (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Magesa, M. M., Mohan, G., Matsuda, H., Melts, I., Kefi, A. S., & Fukushi, K. (2023). Adaptation measures by smallholder farmers to mitigate climate change impacts: A systematic review. Environmental Research, 216, 114655. https://doi.org/10.1016/j.envres.2022.114655

Magesa, M. M., Mohan, G., Matsuda, H., Melts, J., Kefi, F., & Fukushi, K. (2023). Smallholder farmers' adaptation to climate change: A systematic review of adaptation choices in Africa. Agricultural Systems, 198, 103–115. https://doi.org/10.1016/j.agsy.2023.103115

Mase, A. S., Gramig, B. M., & Prokopy, L. S. (2015). Climate change beliefs, risk perceptions, and adaptation behavior among Midwestern U.S. farmers. Climatic Change, 129(1), 317–328. https://doi.org/10.1007/s10584-014-1320-6

Mase, A. S., Gramig, B. M., & Prokopy, L. S. (2015). Climate change beliefs, risk perceptions, and adaptation behavior among Midwestern U.S. crop farmers. Climate Risk Management, 15, 8-17.

Mugambiwa, S. S., & Tirivangasi, H. M. (2017). Climate change: A threat towards achieving 'Sustainable Development Goal number two'(end hunger, achieve food security and improved nutrition and promote sustainable agriculture) in South Africa. Jàmbá: Journal of Disaster Risk Studies, 9(1), 1-6.

Okoro, J. C., Agwu, A. E., & Anugwa, I. Q. (2016). Climate change information needs of rural farmers in Enugu State. Journal of Agricultural Extension, 20(2), 125–139. https://doi.org/10.4314/jae.v20i2.16 Academia+2Amanote Research+2African Journals Online+2

Okoro, J. C., Agwu, A. E., & Anugwa, I. Q. (2016). Climate Change Information Needs of Rural Farmers in Enugu State. Journal of Agricultural Extension, 20(2), 215-232.

Smith, P., Bustamante, M., Ahammad, H., Clark, H., Dong, H., Elsiddig, E. A., ... & Tubiello, F. N. (2014). Agriculture, forestry, and other land use (AFOLU). In Climate Change 2014: Mitigation of Climate Change (pp. 811-922). Cambridge University Press.

Sorvali, J., Kaseva, J., & Peltonen-Sainio, P. (2021). Farmer views on climate change—a longitudinal study of threats, opportunities and action. Climatic Change, 164, 1-19.

Sorvali, J., Kaseva, J., & Peltonen-Sainio, P. (2021). Farmers' perspectives on climate change and adaptation in Finland. Agricultural and Food Science, 30(2), 129–144.

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations. https://sdgs.un.org/2030agenda

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations. https://sdgs.un.org/2030agenda

World Bank. (2020). World development report 2020: Trading for development in the age of global value chains. World Bank Group. https://www.worldbank.org/en/publication/wdr2020