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Social Awareness Strategies a Panacea For Farmers' Climate Change Mitigation Measures in Ikom Education Zone, Cross River State, Nigeria

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Abstract

The study examines social awareness strategies a panacea for farmers' climate change mitigation measures in Ikom Education Zone, Cross River State, Nigeria: implication for Social Studies/Environmental Education. To achieve the purpose of this study, a null hypothesis was formulated to guide the study. A review of related literature was carried out based on the variable of this study. The survey research design was considered useful for the study. A multistage sampling was adopted in selecting the wards and six hundred and fifty-two (652) respondents used for the study. A thirty-item four point Likert scale questionnaire titled Social Awareness Strategies Farmers' Climate Change Mitigation Measures (SASFCCMM) was the instrument used for gathering data for the study. To test the hypothesis formulated for the study, multiple regression statistical tools was used for data analysis. The hypothesis formulated was tested at 0.05 level of significance. The results from data analysis and hypothesis testing indicated that

	there was a joint significant positive influence of seminar and mass media awareness on farmers' climate change mitigation measures. Based on these findings it was recommended among others that the use of mass media awareness in disseminating climate change information should be widely encouraged and utilized in helping farmers to continue to adopt sustainable climate change mitigation measures.

Introduction

Climate change is one of the most critical environmental issues facing the world today. This is evidence by the spate of conferences, campaigns, reports and researches on climate change in the last 20 years (Agenda 21 of Rio declaration, 1992, Intergovernmental Panel on Climate Change (IPCC) 2001, Copenhagen, 2009, Paris, 2016), to mention a few. The agricultural sector has a multiplier effect on any nation's socio-economic and industrial fabric because of the multifunctional nature of the sector. In Nigeria, agriculture is the main source of food and employer of labour employing more than half of the population. It is a significant sector of the economy and the source of raw materials used in the processing industries as well as a source of foreign exchange earnings for the country. Since agriculture in Nigeria is mostly rain-fed, it follows therefore that any change in climate is bound to impact its productivity in particular and other socio-economic activities in the country. The impact could, however, be measured in terms of effects on crop growth, availability of soil water, soil erosion, incident of pest and diseases, sea level rises and decrease in soil fertility. The issue of climate change has become more threatening not only to the sustainable development of socio-economic and agricultural activities of any farmer but to the totality of human existence.

United Nations Framework Convention on Climate Change (2006) defines climate change as a change of weather which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability. The changes in climate are attributed directly to human activities and composition of global atmosphere over a period of time (Kankam & Oden, 2013, Eneji, et al., 2022).

Climate change impacts pose great dangers in Cross River State, Nigeria with consequences such as, sea level rise, flooding, water salinity, increase in pests and diseases among others. These impacts could manifest in food security challenges, damage to infrastructure, social dislocation, and decrease in soil fertility and changes in seasons. Additional impacts include threat to health as rising temperature could bring about diseases such as chronic heat rashes, Cerebra-Spinal Meningitis (CSM), stroke, malaria and other related diseases.

Climate change will affect every citizen, every part of our environment and our natural resources, and thus practically every aspect of our lives, our economy, our urban and sub-urban development patterns. Global concern regarding the devastating impact of climate change has emphasized the need for creating awareness strategies such as seminars, agricultural extension services, mass media awareness and building community based capacity for adaptive measures to mitigate the effects of climate change. These problems of clime change persist by decades in Ikom Education Zone of Cross River State, because farmers are reluctant to fight or keep the local climate on check by their refusal to apply any of the mitigation and adaptive measures provided to them through some if not all of the awareness strategies such as seminars on climate change, environmental campaign groups and others mentioned above in their farms.

Climate Change Mitigation refers to efforts to reduce or prevent emission of greenhouse gases, through reduction in the use of fossil fuel engine to generate power, crop rotation, mulching by farmers to prevent heat from the sun to penetrate the soil, encouraging mix farming, decease from bush burning, planting trees in farm, engage cover cropping. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour.

According to United Nations Development Programme (2007), mitigation refers to actions that reduce the human contribution to the planetary greenhouse effect while adaptation refers to responses to the changing climate and policies to minimize the predicted impacts of climate change. Mitigation actions include lowering emissions of greenhouse gases like carbon dioxide, methane, and particles like black carbon (soot) that have a warming effect. Increasing the net uptake of carbon dioxide through land-use change and forestry can make a contribution as well. As a whole, farming activities result in higher global concentrations of greenhouse gases and to a warming of the planet and the effect is increased by various self-reinforcing cycles in the Earth system (such as the way melting sea ice results in more dark ocean water, which absorbs more heat, and leads to more sea ice loss). Also, the absorption of increased carbon dioxide by the oceans from farming activity is leading to increased ocean acidity with adverse effects on marine ecosystems.

UNDP (2007), also pointed out that there is need to make farmers sensitive towards nature through a strong programme (seminars, agricultural extension services, mass media awareness, government policies, community based organizations, newspapers, textbooks etc.) of climate change and how to mitigate its impact. Social Awareness Strategies and mitigation measures involves creating knowledge, understanding and values, attitude, skills and abilities through seminars, agricultural extension services, mass media awareness, government policies, community based organizations, textbooks, journals, newspapers, and more among individuals and social groups towards the issues of climate change for attaining a better quality environment.

Climate change specialists have repeatedly pointed out that a solution to climate change mitigation will require climate change awareness through seminars, agricultural extension services, mass media awareness, community based organizations activities, textbooks, etc and its proper understanding of the mitigation measures. The education of farmers through the above mentioned strategies will go a long way in achieving this purpose; farmers after being educated can provide a vital link in the delivery of environmental knowledge, its associated problems and solution. In order to fasten their awareness towards climate change it is necessary to know how far social Awareness Strategies have been able to influence farmers perception and behaviour towards climate change and investigate what level of awareness farmers poses from some awareness strategies such as, seminars, agricultural extension services, community based organization as well as mass media awareness and the mitigation skills farmers posses from these strategies to aid the reduction of the impact of climate change to global environment. This research therefore assesses social Awareness Strategies and farmer's mitigation measures in Ikom Education Zone of Cross River State: implication for Social Studies/Environmental Education.

Statement of the problem

Nigeria is experiencing adverse climate conditions with negative impacts on the welfare of millions of people. Farmers are complaining of Persistent droughts and flooding, off season rains and dry spells have sent growing seasons out of orbit, on a country dependent on a rain fed agriculture. Climate change is an unprecedented phenomenon and poses threats to food security in Nigeria as the rain forest regions of Nigeria including that of Cross River State are changing with regards to crops planting seasons.

Climate change has increased the region temperature, reduced the air quality we breath, pollute water, caused flooding, changes in seasons, infrastructural decay; increased pests and diseases, reduced soil fertility and reduced crops yields over the years and farmers are blaming the supreme being for the changes in climate and seasons while they keep on exploring and exploiting the earth's resources. Unless climate change is tackled, all the "best efforts" to help this great country, to come out of food shortages could be to no avail. One of the biggest threats is growing climate unpredictability, which makes subsistence farming difficult. This study posed the following questions: are farmers aware that the earth's temperature is rising because of some of their farming activities?, are awareness strategies or sources of information that farmers in Ikom Education Zone obtain information are assessable to farmers?, are the social Awareness Strategies in anyway influence the mitigation measures adopted by farmers?, does the mitigation measures applied by farmers in Ikom Education Zone reduce climate change impact on farm productivity and environmental safety?.

Research questions

The following research question was raised to guide the study:

1. What is the influence of mass media awareness on farmers' climate change mitigation measures?
2. How does seminar, agricultural extension services, mass media awareness and community-based organizations' activities influence farmers' climate change mitigation measures?

Statement of hypotheses

The following hypothesis was formulated to guide the study:

1. Mass media awareness has no significant influence on farmers' climate change mitigation measures
2. There is no joint significant influence of seminar, mass media awareness on farmers' climate change mitigation measures

Literature Review

Seminar attendance and farmers' climate change mitigation measures

Literature on adaptation and mitigation of natural hazards finds that behavioural responses to hazards depend in large part on risk perception, or beliefs about the existence and characteristics of a natural hazard. In other words, behaviour change is influenced by perceptions of the risks associated with a given natural hazard, which are mediated by beliefs about (1) the existence of the hazard and (2) its characteristics. Perceived risk among individuals or collective, while a critical determinant of willingness to prepare for or mitigate natural hazards, is often at odds with objective assessments of risk. Because perceptions of risk are socially constructed and transmitted, differences in worldviews, personal experiences, expectations about technology, trust in institutions, and other factors can influence awareness and understanding of hazards and decisions and actions (or inaction) in response (Howden, et al, 2007).

IPCC (2015), carried out a study on understanding farmer perspectives on climate change adaptation and mitigation. The roles of trust in sources of climate information, climate change beliefs, and perceived risk. The authors posit that Agriculture is vulnerable to climate change and a source of greenhouse gases (GHGs). Farmers face pressures to adjust agricultural systems to make them more resilient in the face of increasingly variable weather (adaptation) and reduce GHG production (mitigation). The research examined relationships between Iowa farmers' trust in environmental or agricultural interest groups as sources of climate information, climate change beliefs, perceived climate risks to agriculture, and support for adaptation and mitigation responses. Results indicate that beliefs varied with trust, and beliefs in turn had a significant direct effect on perceived risks from climate change. Support for adaptation varied with perceived risks, while attitudes toward GHG reduction (mitigation) were associated predominantly with variation in beliefs. Most farmers were supportive of adaptation responses, but few endorsed GHG reduction, suggesting that outreach should focus on interventions that have adaptive and mitigative properties (e.g., reduced tillage, improved

fertilizer management). One of the ways by which sustainable development and climate change awareness can be enshrined into the minds of farmers is through seminar education and awareness.

In the study of Anderson, et al. (20016), on Climate Change Education for Mitigation and Adaptation. The article presents evidence-based findings on the factors that influence skills, attitude and behaviour change the most, in order to determine what works for formal and non-formal climate change education content, including environmental education, climate change and scientific literacy, and education for sustainable lifestyles and consumption. The evidence shows that educational interventions are most successful when they focus on local, tangible, and actionable aspects of sustainable development, climate change and environmental education, especially those that can be addressed by individual behaviour. Finally, given that the majority of evidence that exists is anecdotal, often in case study format without monitoring and evaluation processes in place that could lead to quantitative as well as qualitative data, the article highlights remaining questions and areas of research that need to be investigated in order to guide effective climate change education policy and practice.

Nwobodo and Agwu (2015), carried out a study on Knowledge level of youth farmers on climate change in Benue State of Nigeria. The study examined the knowledge of youth farmers in Benue State of Nigeria on climate change. Multi-stage sampling technique was used to select 120 respondents from two agricultural zones in the study area. Data was collected using interview schedule. Descriptive and inferential statistics were used in data analysis. Results show that majority (92.4%) of the respondents had strong knowledge of climate change, major sources of climate change information include: radio (85.0%), friends and neighbours (60.8%), personal observation (55.8%), and family members (46.7%). The socio-economic factors affecting knowledge of climate change by youth farmers include: sex ($t = 2.353$; $p \leq 0.022$) and household size ($t= 3.888$; $p=0.000$).It was recommended that the knowledge level of youth farmers on climate change should be improved by providing them relevant information through the mass media awareness, movies; and by providing climate change educational platforms in schools and through outreaches.

Mass media awareness and farmer's climate change mitigation measures

The study of Onkargouda, Shilpa and Namrata, (2013) on Role of Media in Creating Awareness about Climate Change - A Case Study of Bijapur City agreed that climate change is a long-term change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. The Projected climate change impact scenarios indicate increase in and variable trend of both rainfall and temperature into the 21stcentury, reduction in the quantity of surface run off across the various river basins, droughts and intensity of floods in various parts of the country. Major environmental issues are through Forest and Agricultural land degradation, Resource depletion (water, mineral, forest, sand, rocks etc.),

Environmental degradation, Public Health, Loss of Bio diversity, Loss of resilience in ecosystems, Livelihood Security for the Poor The communication of climate change from scientists and policy-makers to the public via the mass media awareness has been a subject of major interest because of its implications for creating national variation in public understanding of a global environmental issue. With all this back ground this research is to assess the role of media in creating awareness about the climate change in Bijapur city. Even it is intended to find which media is best in making the people understand about Climate Change.

The study of admire, (2011) on Climate change, Mediation and Mediatisation in Southern Africa: Towards climate and environmental journalism, discussed climate change which has become an issue of concern for media in recent years. Given the primacy of mediation and mediatisation in modern societies, this paper argues that development journalism which treats audiences as citizens, while prioritising public listening, and deliberative citizenry on climate change discourses is the missing link in current advocacy strategies. This paper demonstrates that representations and news discourses of climate change in selected South African and Zimbabwean newspapers have largely been framed within the strictures of the global scientific hegemony which gives primacy to alarmism, technocratic jargon, and officialdom. Such reportage has thus far been instrumental in the creation, reproduction and circulation of top down approaches to climate change adaptation which obfuscates the role of indigenous knowledge systems and constricts voices of the poor in local debates. It also argues that advocacy and translation role of media in Africa is being constrained by the dearth of science journalism, news commoditisation, media commercialisation, and urban bias of newsrooms. In a context where climate change is threatening to wipe off livelihoods of billions of people, the media is crucial for the dissemination of truthful information on weather forecasts and disaster warning to the public within the climate information cycle. It argues that both traditional and citizen centric media are important cogs in the climate information cycle as information disseminators, mobilisers, translators, environmental scanners, platforms for debate and fora for intercultural learning.

The study of Muhamad, (2011) on the use of face book to increase climate change awareness among employees posited that the explosion of Facebook has suggested the richness of new media for effective communications to engage employees. The study examined the usage of Facebook to increase climate change awareness among employees. By using Media Richness Theory, this research aims to demonstrate that a lean medium such as Facebook can be effectively used for equivocal task, such as raising environmental awareness task, such as raising environmental awareness. Data was collected using a questionnaire from a sample consisting of 20 employees within the Klang Valley with Facebook account, selected through purposive sampling method. A simple Pearson's correlation test was performed to determine: (1) the direction of relationship on one-to-one basis between the independent variable and dependent variable of the study and (2) the strength of the relationship. Pearson's correlation test results revealed that there is a strong positive correlation between perceived media richness

of Facebook ($r = 0.415$, $p > 0.05$) and the perceived climate change awareness among respondents. This relationship is substantial. The results showed that there is a substantial relationship between perceived media richness of Facebook and the perceived climate change awareness.

Also, Matthew, Allen and Patricia (2015) conducted a study on Using Web 2.0 and Social Media Technologies to Foster Pro-environmental Action in United State of America. The authors agreed that Research from a variety of disciplines suggests that online technologies (i.e., Web 2.0 and social media) have considerable potential for spurring pro-environmental action; however, relatively little work examines how to effectively capitalize on these communication and organization tools. This review paper describes the Technologies for Pro-environmental Action Model (TPAM), a conceptual framework that explicates how different functions of Web 2.0 and social media (i.e., informational, relational, and experiential) can generate and/or facilitate personal, social, and contextual pathways to environmentally responsible behaviors. As derived from the TPAM, the likelihood of achieving practical goals of increasing pro-environmental behaviours is enhanced when technological functions are matched to the different pathways to pro-environmental action. For example, the relational function of technologies, as exemplified by Social Networking Sites (SNSs), should be particularly effective in communicating social norms supportive of environmentally responsible behaviors. The TPAM is intended as a guide to develop novel approaches, research questions, and methodologies in leveraging Web 2.0 and social media technologies to promote pro-environmental action. Results will contribute to basic theory development and work in applied settings (e.g., local environmental organizations) in order to effectively communicate and organize with different segments of the population to increase sustainable behaviours.

The study of Hywel, Williams, McMurray, Lambert (2015) on open forums and echo chambers in social media discussions of climate change. The result analysed a large dataset of Twitter messages about climate change. The authors constructed several forms of social network for users sending and receiving climate-related messages. They also analysed message content to assess user attitudes towards climate change and sentiment in user interactions. The study aimed to characterise social media discussions of climate change by mapping the structure of user social networks, measuring the distribution of user attitudes across those networks, and exploring user interactions and behaviours. The summary of the results reveals that social media can be found in accompanying supporting information for mitigating climate.

Research Methodology

The research deign that was adopted for this study is the survey research design. Ndiyo (2005) defined a survey research as a scientific experiment conducted on a large scale on a defined population to determine some desirable characteristic of a population. Survey research is a research that is directed towards determining the nature of the situation that exits at the time of

investigation. He describes that it is a type of research that studies large and small population by selecting and studying sample chosen from the population to discuss the relative incidence distribution, interrelation of sociological variables.

Survey research deigns is therefore useful for opinion and attitude studies. It depends basically on questionnaire and interviews as means of data collections. The survey research design was considered appropriate for this study because it allows the researcher to make inference about the population by studying the sample of the study. This design was adopted because the researcher" has no control of the independent variables; social Awareness Strategies as well as the dependent variable which is climate change mitigation measures among farmers.

This study was carried out in Ikom Education Zone of Cross River State, Nigeria. According to available records, the coordinate of the area stretches between longitude $7^{0}45^{'}$ and $9^{0}15^{'}$E of the Greenwich Meridian and Latitude $5^{0}30^{'}$ and $6^{0}30^{'}$N of the Equator. The zone is occupying an area of 7632km^{2}. The area is located midway between Cross River South and the Northern Education Zones. It is bounded in the north by Ogoja, Obudu, and Obanliku Local Government areas of Northern Education Zone of Cross River State, and in the south by Biase and Akamkpa Local Government areas, in the east by Republic of Cameroon, and Ebonyi State in the West.

For administrative convenience, the area is divided into six local government areas, namely: Abi, Yakkur, Ikom, Etung, Boki, and Obubra. It has a projected population of one million five hundred and twenty five thousand two hundred twenty (1,525,220) (National Population Commission 2017 projection). The people of Ikom Education Zone like any other district are believed to have migrated from the Bantu race of Central Africa. The influence of the early missionaries is significantly felt in this area. Thus, Christianity is the predominant religion. Generally, the people cherish their culture and tradition. Like all patriarchal society, the area enjoys a rich cultural heritage, elaborately manifested in their traditional dances, marriages, customs, chieftaincy, age grades, and festivals. These festivals include Leboku New Yam Festival in Yakkur, Ekpache Nkome new yam festival in Ikom, Abu New yam festival in Obubra.

The majority of the people are subsistence and commercial farmers while some are civil servants and traders. Citizens of the research area also take trade in fishing. The major food crops produced are yam, plantain, banana, maize, rice, pineapple and cassava while the cash crops produced are cocoa, palm produce, cashew, rubber and timber. Citizens of the research area also take trade in fishing. The tourism sites of the zone include the Agbokim waterfall in Ikom, Kayang primate's forest in Boki, Nkarasi monoliths in Ikom. See fig 1.

The population of the study comprises all the farmers in Ikom Education Zone of Cross River State. There are one hundred thousand, three hundred and sixty two (100,362) registered farmers in Ikom Education Zone, Cross River State. See table 1.

The researcher adopted multistage sampling techniques to select the sample for this study. A stratified sampling technique was used to group the population under study into local government area and Gender. Simple random sampling technique was used in selection of wards in local government areas in Ikom Education Zone, purposive was used to select the number of respondents in each LGA's in the zone while accidental sampling techniques was used to administer the questionnaire for data collection.

Table 1
Population of farmers in Ikom Education Zone of Cross River State

S/N	Local Government	Population		Total
		Male	Female	16730
1	Boki	6730	10000	16944
2	Etung	7334	9610	16916
3	Ekom	8468	8468	16936
4	Obubra	1320	3736	16200
5	Yakurr	8100	8100	16730

Source: Cross River State Ministry of Agriculture (CRSMA)

The sample for this study was 667 male and female farmers from six (6) local government areas with (66) wards in Ikom Education Zone of Cross River State. The number of farmers selected was to obtain adequate representative samples of farmers from each Local Government Areas. All the selected wards in the four LGA's selected were used to ensure equal representation in the study. See Table 2.

The instruments used for data collection was a set of survey questionnaire called "Social Awareness Strategies and Farmers Climate Change Mitigation Measures Questionnaire" (SASFCCMMQ). The questionnaire was divided into three sections A, B and C. Section A focused on the personal data of the farmers such as sex, age, local government area of farmer, educational qualification. Section B elicited information on the various social Awareness Strategies under studies while section C measure mitigation measures among farmers.

Table 2
A representation of percentage sampled from each wards and LGA's in Ikom Education Zone of Cross River State

S/N	LGA's	Population		Total	Total number of wards	Wards sampled	Respondent sampled per LGA	Percentage sampled %
		Male	Female					
1.	Abi	7318	9318	16636	10	2	167	1
2.	Boki	6730	10000	16730	11	2	167	1
3.	Ikom	8468	8468	16916	11	2	169	1
4.	Obubra	13200	3736	16936	11	2	169	1

Validity refers to the ability of a research instrument to measure what it is meant to measure. To ensure the extent to which the instrument measured what it purports to measure, the questionnaire on Social Awareness Strategies and Farmers Mitigation Measures (SASFCCMMQ) is developed by the researcher through extensive literature review.

The initial pool was made up of 50 items. The instrument was first given to a lecturer in the Department of Environmental Education and three (3) experts in research and statistics to scrutinize for item relevance to the variables under consideration. While some items were merged few others were re-written for inclusion in the instrument as a result of the scrutiny. A final draft of 20 items was used in the study.

Reliability refers to the consistency with which the items measure what they are supposed to measure. To ascertain the reliability of the instrument, a trial test was conducted in Akankpa LGA on 50 farmers drawn from the population who are not members of the sample to be used for the study. The single test reliability method was adopted. In this approach, the instrument was administered to the sample. The responses from the administration were correlated using Crombach alpha Coefficient statistic. The Cronbach alpha coefficient results showed a reliability coefficient ranging from 0.676 to 0.732 which indicated that the instrument was reliable enough to be used for this study. See Table 3.

Table 3
Cronbach alpha reliability of the instrument

Variables	No. of Items	$\bar{x}$	SD	Crombach Co-efficient
Seminar	5	13.742	2.836	0.676
Mass media awareness	5	15.621	3.718	0.732
Famers mitigation measures	10	24.328	5.324	0.713

The researcher with the help of research assistant carryout the administration of the questionnaire in all the wards that were selected to participate in the study. There was prior notice given to all the heads of the villages selected notifying them about the researcher's intention to visit their village.

The instrument was administered on the sample group under the closed supervision of the researcher and research assistants. The research assistants were trained of the techniques involved in the administration of the instruments. There are therefore asked to ensure individual farmers' concentration and also prevent exchange of information and discussion of any form among the subjects. Six hundred and sixty seven (667) copies of questionnaire were administered, but six hundred and fifty two (652) were properly filled and returned.

The researcher developed a key, which served as a guide for coding the data collected for, analysis. The items on the questionnaire were sorted based on the variables measured.
The total number of the responses ticked (√) in each of the section covering all the variables under the study was added. The total scores for each section were recorded against these variables. Linear regression statistical technique will be use in the analysis. These scores will be recorded on the blank column as indicated by the researcher.

The items was scored on a four point likert scale ranging from Strongly agree (SA), Agree (A), Disagree (D) and Strongly disagree (SD) for each worded items. The scores were in this order:

(for positive worded items). `	(for negative worded items)
SA----- 4	SA------- 1
A-------3	A--------- 2
D--------2	D-------- 3
SD-------1	SD------- 4

But the reverse is the case for negatively worded items. The questionnaires were presented in order to remove ambiguity and misinterpretation before administrating them to the actual samples.

Results and Discussion

This chapter covers the analysis of data obtained from respondents through the use of questionnaire designed for data collection in the study. The chapter covered general description of variables, presentation and interpretation of results as well as discussion of findings. The chapter is presented under the following sub-heading: -

4.1 General description of variables
4.2 Presentation of results
4.3 Discussion of findings

General description of variables

In this section, the mean and standard deviation for the main variables in the study are presented. The main independent variable is social Awareness Strategies which are categorized into; Seminar and Mass media awareness.

The dependent variable is climate change mitigation measures in Ikom Education Zone of Cross River State. A sample of six hundred and fifty two (652 farmers was used for the study. The computed mean and standard deviation of the main variables is presented in Table 4.

Table 4
General description of variables

Variables	N	$\bar{x}$	SD
Seminar	652	14.3543	1.03484
Mass media awareness	652	15.5322	2.36407
Climate change mitigation measures	652	24.2915	3.23181

Presentation of results

In this section, each of the study hypotheses is restated in the null form. The results of data analyzed and their interpretation are presented. The presentation is done hypothesis by hypothesis followed by interpretation of results obtained from the analysis of data. Each hypothesis is tested at 0.05 level of significance.

Ho: 1

Mass media does not significantly influence farmer's climate change mitigation measures. The independent variable in this hypothesis is mass media while the dependent variable is farmer's climate change mitigation measures. Simple linear regression statistical tool was used for data analysis. The result of this analysis is presented in Table 5.

The result of analysis presented in Table 5 showed that the predictor or independent variable (mass media) significantly influence the predicted variable (farmers' climate change mitigation measures). The predictor variable accounted for 27.5% of the variance in farmers' climate change mitigation measures in Ikom Education Zone of Cross River State. This showed a significant positive relationship between the predictor and predicted variables.

Furthermore, the regression ANOVA revealed there was a significant positive influence of mass media on farmers' climate change mitigation measures $F(1, 650) = 246.235$; $p<.05$. Based on this result, it can be deduced that an increase in the use of mass media to create climate change awareness, the better the mitigation measures that would be adopted, which will enable the farmers to cope more positively with the negative effects of climate change. Again, a reduction in the use the use of mass media to create climate change awareness, the

more negative and less effective the mitigation measures that would be adopted by farmers in the study area.

Table 5

Simple linear regression analysis of the influence of mass media awareness on farmers' climate change mitigation measures in Ikom Education Zone of Cross River State (N = 652)

Model	R	R^2	Adj.R^2	Std error of estimate
1	.524	.275	.274	3.60667

Source of variance	SS	Df	MS	F	Sig
Regression	3203.041	1	3203.041	246.235	.000
Residual	8455.235	650	13.008		
Total	11658.276	651			

Ho: 2

There is no joint significant influence of seminar, mass media awareness on farmer's climate change mitigation measures. The independent variables in this hypothesis are seminar and mass media awareness while the dependent variable is farmer's climate change mitigation measures. Simple linear regression and Multiple regression statistical tool was used for data analysis. The result of this analysis is presented in Table 6.

The result of analysis presented in Table 6 showed that the combination of all the predictor variables (seminar and mass media awareness) are joint predictors of farmers' climate change mitigation measures in Ikom Education Zone of Cross River State. The predictor variables accounted for 29.5% of the variance in farmers' climate change mitigation measures in the study area.

Furthermore, the regression ANOVA revealed that, there was strong joint contribution of the predictor variables to farmers' climate change mitigation measures $F(4, 647) = 67.563$; $p < 0.05$. Based on the result, it was revealed that when all the contributor variables; seminar, agricultural extension services, mass media awareness and community-based/non-governmental organizations' activities are used together, they significantly contribute to farmers' climate change mitigation measures.

The regression coefficient showed that two independent variables out of the two; mass media awareness ($\beta = .463$; $t = 12.686$; $p<.05$), is the most influential variable in the prediction of farmers' climate change mitigation measures because it is statistically significant. The result

further showed that seminar (β -.031; t = -.939; p>.05) is not influential in the prediction of farmers' climate change mitigation measures in Ikom Education Zone of Cross River State.

Discussion of findings

This section focuses on the discussion of the findings obtained in the study based on each hypotheses formulated to guide the study.

The finding from analysis and testing of hypothesis showed that the null hypothesis was rejected. This implied a significantly strong positive influence of seminar, mass media awareness on farmers' climate change mitigation measures in Ikom Education Zone of Cross River State. This could be because the joint level of seminar usage as a strategy for creating climate change awareness is high and the strong positive influence observed in the study is as a result of the few farmers that have attended seminar on climate change. It is believed that the greater the usage of seminar, the more positive mitigation measures farmers in the study area will adopt. The finding of this study agrees with the finding of Millar (2012) which reported that seminars are useful outlets for the promotion of climate change mitigation and campaign. Awareness creation activities carried out through seminars and the various anti-environmental degradation clubs and organizations that deal with environmental protection have been unsuccessful. It is noted that both urban and rural people were not well informed about the mode of destruction and protection of the environment.

Table 6

Multiple regression analysis of the influence of seminar, mass media awareness on farmers climate change mitigation measures in Ikom Education Zone of Cross River State (N = 652)

Model	R	R^2	Adj.R^2	Standard error of estimate	
1	.543	.295	.290	3.56511	
Source of variance	SS	Df	MS	F	Sig
Regression	3434.905	4	858.726	67.563	.000
Residual	8223.371	647	12.710		
Total	11658.276	651			
Variables	Unstandardized coefficients		Standardized coefficient	T	Sig
	B	Std error	Beta		
(Constant)	17.723	2.418		7.330	.000
Seminar	-.128	.136	-.031	-.939	.348
Mass media awareness	.828	.065	.463	12.686	.000

The finding of this study also supported the finding of Mba (2009) which revealed that many personal adaptive steps can be taken to counteract the ill effects of climate change. There are

many things we can do as preventive measures which include tree planting, increase in water intake during hot weather and reducing skin cancer risk by avoiding exposure among others. There is urgent need for a better understanding of the changing climate pattern and how they affect extreme weather events. Enhancing knowledge of climate forces is critical for improving projections of future climate change. Adequate knowledge and awareness of the effects of climate change will help make communities to join forces in reducing the vulnerability of societies to climate-related risks both now and in the future. This can be achieved through the use of seminar as an environmental awareness strategy for reducing the effect of climate change and promoting adaptation and mitigation measures.

The finding of this study contradicted the finding of Adesope (2007) which reported that of the many sources of information available to farmers, agricultural extension is the most important for analyzing the adoption decision. Also, in the specific case of climate change adaptation, access to climate information may increase the likelihood of uptake of adaptation techniques.

The finding of this study also contradicted the finding of FAO (2003) which revealed that it has been observed that agricultural extension is involved in public information and education programs that could assist farmers in adapting and mitigating the effects of climate change. Such involvements include awareness creation and knowledge brokerage on the issues of climate change; building resilience capacities among vulnerable individuals, communities and regions; encouragement of wide participation of all stakeholders in addressing climate change issues and developing appropriate framework for coping/adapting to climate change effects/impacts.

Implication to Social Studies and Environmental Education

This study can be useful to teachers in Social Studies and Environmental Education and other departments who may want to know the level at which social Awareness Strategies aid farmer's climate change mitigation measure in Ikom Education Zone of Cross River State. It can enable Social Studies/Environmental education teachers work on how to improve on the various climate change mitigation measures available. It would also enable teachers apply the various modules that aids cutting down of green house effects.

This study can be useful to students at all levels especially those in Social Studies and Environmental Education who may want to know the level at which seminar and mass media awareness awareness strategies aids climate change mitigation measures. The study can enable Social Studies students work individually and collaboratively on how to improve on the various climate change mitigation measures available.

Also it can be of great importance to Science/Social Science researchers in Cross River State, Nigeria and the world in general who are interested in carrying out research on climate change impacts, it effects, adaptations and mitigation. It would enable researchers who intend to carryout research on climate change on the research area, understand the level of awareness the farmers in the area. This research can pave way for other researchers who intend to take up a research on climate change in this zone and Nigeria as a whole.

It can be of help Social Studies/Environmental Educators in Universities and Collages who are in charge of transmitting information as it concerns environmental issues. It can enable Social Studies educators to make available useful information, regarding climate change, which can enable all stakeholders tackle climate change with the application of all the necessary adaptation and mitigation measures.

Summary of the study

The main purpose of this study was to investigate social Awareness Strategies and farmer's mitigation measures in Ikom Education Zone, Cross River State, Nigeria: implication for Social Studies Education. To achieve the purpose of this study, a research question was posed and transformed into a null hypothesis to guide the study.

A review of related literature was carried out to examine what has already been documented on the variables of this study by various relevant scholars and researchers. The survey research design was considered useful for the study. The simple random sampling technique was adopted in selecting the four local government areas used for the study. The proportionate simple random sampling technique was adopted in selecting the wards and six hundred and fifty two (652) respondents used for the study.

A structured thirty-item four point Likert scale questionnaire was the instrument used for gathering data for the study. To test the hypotheses formulated for the study, simple linear regression and multiple regression statistical tools were used for data analysis. The hypotheses formulated were tested at 0.05 level of significance. The result from data analysis and hypothesis testing indicated that;

i. There is a significant positive influence of mass media awareness on farmers' climate change mitigation measures.
ii. There is a strong joint significant positive influence of seminar, mass media awareness on farmers' climate change mitigation measures

Conclusion

The study aimed at assessing social Awareness Strategies and farmer's mitigation measures in Ikom Education Zone of Cross River State: implication for Social Studies. The findings of the study revealed that there is a joint strong positive significant influence of seminar attendance, agricultural extension services, mass media awareness and community-based/non-government organizations' activities on farmers' climate change mitigation measures in the study area.

Changes in global climatic conditions have become increasingly obvious especially in the area of this study. The need for people especially the rural inhabitants to develop adaptation and/or mitigation measures has become paramount in order to cushion the harsh effects associated with such changes. Climate is seen as a consequence of poor human-environment interaction that has resulted in severe alterations in natural processes. This call for urgent step that would enable people cope with changes in climate. Environmental awareness has been identified as a viable tool that can be utilized to sensitize and build capacity for climate change adaptation and possible mitigation measures.

It has therefore become an issue of utmost consideration among various stakeholders to brace up and empower the vulnerable with requisite support that would enable them cope with the effects experienced as a result of climate change. This is because an uninformed or poorly informed individual lives in uncertainty and cannot save the environment from further degradation and damage. Hence, the need to raise a citizenry that is aware of and capable of participating actively in solving environmental problem and preventing the occurrence of new ones at all times.

Recommendations

Based on the findings obtained in this study, the following recommendations were made:

i. The use of mass media awareness in disseminating climate change information in the study area should be widely encouraged and utilized in helping farmers understand and continue to adopt useful and sustainable climate change mitigation measures.
ii. Community-based organizations as well as non-governmental organization should be used more effectively in sensitizing and building the capacity of farmers to be able to cope with and adopt positive and climate change mitigation measures.

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