Challenges to the Use of Mass Media for Climate Change Mitigation Among Arable Crop farmers in Oyigbo Local Government Area, Rivers State

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ABSTRACT

Challeges to the use of mass media for climate change mitigation among arable crop farmers in Oyigbo Local Government Area, Rivers State was investigated with special focus on describing the socio-economic characteristics of arable crop farmers in the study area; identified the climate change mitigation strategies communicated by the mass media to the arable crop farmers; and identified the constraints to communication and adoption of the mitigation strategies for arable crop production in the study area. A total of one hundred (100) questionnaire were distributed out of which ninety six (96) were retreived and used for the study. Data were presented using frequency, percentage, mean scores, likert scale and, Simple regression analysis. Result showed that greater proportion (56.3%) were females, most (30.2%) were within 51 – 60 years, were married (54.2%), had secondary education (36.5%), had a mean household size of 6 persons with (65.6%) and 30.2% had farming experience between 11 to 15 years and an average monthlyincome of ₦63,177. Climate change mitigation strategies communicated by the mass media to the arable crop farmers were use of short gestation crops (93.8%) followed by afforestation (88.5%). The media were effective in the communication of afforestation ($\bar{x}$ =3.00), use of short gestation crops ($\bar{x}$ =2.89), improving soil conditions by natural deposits ($\bar{x}$ =2.82), etc. The constraints to the communication and adoption of mitigation strategies were: illiteracy of the food crop farmer ($\bar{x}$ =3.54), lack of /inadequate extension programmes directed to meet the climate change mitigation strategies in food crop production ($\bar{x}$ =3.50), government irresponsiveness to climate risk management ($\bar{x}$ =3.47). The result of the simple regression analysis showed that education was highly significant in influencing the use of a particular mass media among arable crop farmers $P \leq 0.05$ and $P \leq 0.10$. The study concluded that in spite of the constraints experienced in communication and adoption of the mitigation strategies among arable crop farmers, they made efforts to access information on climate change issues from radio and television. The study recommends spread of information through the media that farmers like to use for information sourcing, such as radio and television programmes.

Keywords: *Challenges, Use of Mass Media, Climate Change Mitigation Arable Crop farmers*

Introduction

There is need for sustainable agriculture to meet the increasing demand for food for the growing population in Nigeria. Food production necessitates the use of resources, which might be natural or man - made and the natural resources refer to all the materials and forces that nature provides such as land, water, sunshine, air, temperature and soil conditions (Otitoju, 2013). In order to ensure food security, we need to understand the climatic changes around us and how it affects agricultural productivity and rural livelihood.

Climate is defined as the state of the atmosphere formed through time by meterologial events (Oyeleke, Bolaji and Olowa, 2009). Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) (2014) as a change in the state of the climate that can be identified (e.g., through statistical tests) by changes in the mean of climate variables and/or the variability of its properties, and that lasts for a long time; typically decades or longer. Although the length of time it takes for changes to materialize is important, the degree of deviation from the norm and its consequences for the environment are the most important factors. The earth's climate is a delicately balanced system; even a minor increase in air temperature can cause global climate changes, hence the amplified greenhouse effect is sometimes referred to as climate change or global warming (NwaJesus, 2014). According to Albert and Isife (2014), climate change is a change in the statistical distribution of weather patterns when that change last for an extended period of time. Climate change and global warming iis the current global problem many countries are facing. Emission of greenhouse gases is responsible for global warming and subsequent climate variability. The emission of greenhouse gases from gas flaring, open burning, vehicle emissions, deforestation, and use of solid fossil fuel for cooking are some of the causes of climate change in Nigeria. Nigeria is still practicing rain fed agriculture which renders her vulnerable to the adverse effects of climate change. Extreme climatic events such as flooding, extreme heat, and drought has led to soil degradation which results in low crop yields. Decline in agricultural productivity discourages the farmers and may lead to change in livelihood especially in the rural settings. This can also lead to migration from rural to urban regions thereby affecting development of rural regions in the country (Agbola & Fayiga, 2016).

Anthropogenic factors such as urbanization, deforestation, population explosion, industrialization, and the release of Green House Gases (GHGs) have been identified as major contributors to the ozone layer depletion and associated global warming and climate change in recent decades (Buba, 2004; Nigerian Environmental Study/ Action Team (NEST), 2003; Odjugo, 2007). Unsustainable industrialization, which emits greenhouse gases (GHGs), is, for example, seen as the primary reason (Odjugo, 2009). After the industrial revolution, the levels of greenhouse gases (GHGs), primarily carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4), have been quickly increasing. The increased levels of GHGs caused a greenhouse effect, which changed precipitation patterns and global temperatures around the world, resulting in changes in various climate parameters such as cloud cover, precipitation, temperature ranges, sea levels, and vapour pressure (Ministry of Environment of the Federal Republic of Nigeria (MoEFRN), 2003). Changes in precipitation and temperature have had an impact on a number of areas. Agriculture, forestry, water resources, biodiversity, desertification, human health, and ecosystem goods and services are all affected on a global scale (Khanal, 2009; Rosegrant et al., 2008).

Increases in temperature may impact both the physical and chemical qualities of the soil at the same time. Increased temperature may hasten the release of carbon dioxide (CO_2), resulting in less-than-ideal growing conditions for plants. Crops often respond badly when temperatures surpass the ideal level for biological activities, with a sharp decline in net growth and yield. Heat stress has the potential to wreak havoc on farmed crops' physiological development, maturation and yield (Khanal, 2009). Mitigation and adaptation are the two options for dealing with climate change. Mitigation refers to actions or policies that reduce greenhouse gas emissions, whereas adaptation refers to responses to changing climates and policies that reduce the predicted impacts of climate change (Women and Children Development Initiative (WACDI), 2011). Effective eco-friendly education through the mass media is one of the finest techniques to capacity development on environmental and climate change resiliency (Onokerhoraye, 2011). As a result, if climate change mitigation is a top priority, information sourcing is a must in this capacity-building process (Inyang, Ekong and Isiugo-Abanihe, 2004). Agricultural extension agents are primarily responsible for assessing and distributing important information in order to achieve community and agricultural development policy goals in the short, medium, and long term (Inyang, Andiya and Awolumate, 2012). It is also strategically organized to spread information on crops, fisheries, forestry and livestock, among other topics.

Communication of important information regarding climate smart agriculture is not off the list of knowledge that needs to be spread across the research region as soon as possible. The ambiguity surrounding Nigeria's changing climate is palpable, and scientific perspectives in the literature predict that as climatic circumstances change, large uncertainties would emerge (Inyang, Unung and Ekanem, 2013). Despite the fact that both good and negative situations are being discussed, significant attention is being paid to the increased risk to the farmer in terms of productivity. Farmers in Rivers State may not understand the causes of climate change (Inyang, Unung, and Ekanem, 2013), but it is certain that the effects of climate change will alter cropping and soil management systems, resulting in a slow of diversification strategies to mitigate and adapt to changing conditions (Fischer et al. 2002). Through the internet, television, radio and newspapers, the media provide a possible platform for a huge number of individuals to receive information. The media is one of the most important vehicles for delivering critical climate information (Awolumat, 2018), especially in already vulnerable regions and communities. It took the world far too long to acknowledge that the earth is warming and that human beings are primarily to blame (IPCC, 2007).Not everyone on the planet is ready to recognize that everyone can help lessen the damage (Ekpoh and Ekpoh, 2011). Specifically, the study sought to:

i. describe the socio-economic characteristics of arable crop farmers in the study area;
ii. identify the climate change mitigation strategies communicated by the mass media to the arable crop farmers;
iii. assess the perceived effectiveness of the mass media in communicating the mitigation strategies; and
iv. identify the constraints to communication and adoption of the mitigation strategies for arable crop production in the study area.

Research Hypotheses

$H0_1$: The use of mass media is not influenced by socio-economic characteristics of the arable crop farmers.

METHODOLOGY

Area of the Study

The research was conducted in Oyigbo Local Government Area of Rivers State. Oyigbo Local Government Area (LGA) is divided majorly into two regions namely, Ndoki region and Asa region. Ndoki region comprise of the following communities; Afam Uku, Afam Nta, Ayama, Azuogu, Egberu, Mgboji, Marihu, Obeakpu, Obete, Obunku, Okoloma, Okpontu, Umuagbai and Umuosi while Asa region comprise of the following communities; Obigbo, Kom Kom, Izuoma, Obeama and Nmirinwayi.

According to census of 2006, the population of Oyigbo LGA is 125,331 people. Oyigbo Local government area has both Urban and semi-urban areas. National Population Commission of Nigeria (2006). Apart from the indigenous people of Oygibo origin of the areas, there are settlers from all over the world in the area.

Figure 3.1. *Map of Rivers State showing with arrow the study area.*

The study employed a descriptive survey design and the study's population includes all arable crop farmers in Oyigbo Local Government Areas of Rivers State. There

are about three hundred and forty-seven (347) registered arable crop farmers in Oyigbo Local Government Area of Rivers State (Rivers State Ministry of Agriculture cited in Okorie and Elenwa, 2021). The study used multistage sampling procedure. In the first stage, Oyigbo Local Government Area was selected, in the second stage, ten (10) communities will be randomly selected and in the third stage, seventy (70) arable crop farmers were randomly selected from Ndoki region and thirty (30) selected from Asa region making a total of one hundred (100) arable crop farmers used for this study. The ten (10) communities that were chosen include Egberu (8), Okoloma (11), Okpontu (13), Umuagbai (6), Afam Uku (14), Obeakpu (10) and Afam Nta (8) for Ndoki region while Kom Kom (14), Izuoma (9) and Obeama (7) were chosen for Asa region. The choice of more communities from Ndoki region is based on the fact that the region has more communities against Asa region. The data were gathered from primary sources.

Results and Discussion

Socio-Economic Characteristics of the Respondents

Result in table 1 revealed that most (56.3%) of the arable crop farmers were females while only 43.8% were adult males. This means that in Oyigbo LGA, arable crop farming is dominated by the female folks wherein they play a substantial role in agriculture and rural financial development and consequently will adapt more without difficulty to climate change than men. This is consistent with the findings of Albert and Okidim (2014) who found that crop production in Ahoada East local government area of Rivers kingdom is dominated by females. The mean age of 45 years is a sign that they are particularly young adults. Younger farmers are extra experimental and efficient than older farmers and might be greater disposed to adopt strategies that build their resilience than their older counterparts. This result is not far from the findings of other researchers in distinctive parts of Nigeria. Okorie and Elenwa (2020) stated that the average age of gender in accessing climate information for climate adaptation among arable crop farmers in Oyigbo Local Government Area was 45 years. Maritally, the study found out that most (54.2%) of arable crop farmers were married, while 16.7% of them were seperated and 13.5% were single. This implies that arable crop farming within the study area is dominated by married folks who are accountable and have families to carter for. An implication of this is an increase in number of mouths to be fed as well as quantity of family-farm labour availability. This finding concurs with the study of Okorie et al (2021) who discovered that majority of gender climate information utilization for climate adaptation by arable crop farmers in oyigbo local government area were married. Educationally, a more percentage (36.5%) had secondary education, 31.3% had tertiary education, 28.1% had no formal education and 4.2% had primary education. This means that majority of arable crop farmers in the study area possed one form of formal eductaion or the order. the level of education acquisition has an implication in the utilization or adoption of information on agriculture mainly climate change mitigation similar degree of literacy was recorded by Mbube et al (2021) among farmers in influence of traditional communication media in the dissemination of crop-based technologies among farmers in south-east senatorial district, Rivers State. With this level of schooling, farmers in the region might be without problems disposed to adopting techniques in order to help them manage climate change.

Result on family size showed that greater (40.6%) of arable crop farmers had family sizes ranging between 1 to 4 persons. The mean hosehold was 6 people; this implies that arable crop farmers inside the study area had a fairly large household size. The average size of six households is consistent with the nationally prescribed size of six households (Nifeipiri and Elenwaa, 2020). On the years of farming experience, most (30.2%) of the arable crop farmers had farming experience between 11 to 15 years. The average number of years in farming was 12 years, that is an indication that these farmers have a good years of experience in farming to qualify them to able to reply to the problems relating to climate change in their farming experience even as it pertains to adaptation and mitigation strategies employed. This mean years of experience is higher than mean years of experience (9 years) found among by Elenwa and Emodi (2019). Finally the result on income revealed that most (18.8%) arable crop farmers earned a monthly income between ₦61,000 – ₦79,000. The mean monthly income was ₦63,177. This suggests that the monthly income of the respondents can be said to be high specifically as their median monthly income was higher than the Nigerian government minimum wage of ₦30,000 monthly ((Nifeipiri et al, 2020).

Table 1: Socio-Economic Characteristics of Arable crop farmers in the LGA

Variables	Freq. (n =96)	%	Mean ($\bar{x}$)
Sex			
Male	42	43.8	
Female	54	56.3	
Age			
21 - 30 years	20	20.8	
31 - 40 years	14	14.6	
41 - 50 years	22	22.9	45 years
51 - 60 years	29	30.2	
61 - 70 years	11	11.5	
Marital status			
Single	13	13.5	
Married	52	54.2	
Seperated	16	16.7	
Divorced	6	6.3	
Widow	9	9.4	
Educational Level			
No formal education	27	28.1	
Primary education	4	4.2	
Secondary education	35	36.5	
Tertiary education	30	31.3	
Household size			
1 - 4	39	40.6	
5 - 8	33	34.4	6 persons
9 - 12	14	14.6	
13 and above	10	10.4	
Experiene			
1 - 5 years	4	4.2	
6 - 10 years	18	18.8	
11 - 15 years	29	30.2	12 years
16 - 20 years	23	24.0	

21 years and above	22	22.9	
Monthly income (₦)			
20,000 – 30,000	6	6.3	
31,000 – 40,000	8	8.3	
41,000 – 50,000	16	16.7	₦63,177
51,000 – 60,000	15	15.6	
61,000 – 70,000	18	18.8	
71,000 – 80,000	5	5.2	
81,000 – 90,000	16	16.7	
91,000 – 100,000	12	12.5	

Source: Field survey, 2022

Climate change mitigation strategies communicated by the mass media

Result on the Table 2 showed that most (93.8%) of the respondent indicated use of short gestation crops as the most communicated mitigation strategy communicated by the media. This was followed by afforestation (88.5%), improving soil conditions by natural deposits (84.4%), mixed farming (83.3%), planting of cover crops and planting of cover crops to help conserve soil moisture (81.3%), use of disease/pest resistant varieties (80.2%), planting different varieties of crops and crop rotation (75%), mulching adjusting (74%), planting dates (71.9%), use of flood tolerant crops (59.4%), planting of shade and shelter providing trees (54.2%), use of drought tolerant crops (51%) while the least communicated mitigation strategies include the following; shortening the length of growing period (36.5%), changing land area cultivated (21.9%), diversifying from farm to non-farm activities (17.7%) and planting on ridges (15.6%). This is an indication that the media communicates various mitigation strategies to arable crop farmers in the study area.

Table 2:Climate ichange imitigation istrategies icommunicated iby ithe imass imedia

Mitigation strategies communicated to crop farmers	**Frequency (n=96)**	**Percentage**
Use of improved varieties		
Use of short gestation crops	90	93.8
Use of flood tolerant crops	57	59.4
Use of drought tolerant crops	49	51.0
Use of disease/pest resistant varieties	77	80.2
Planting different varieties of crops	72	75.0
Diversifying from farm to non-farm activities	17	17.7
Mixed farming	80	83.3
Planting of cover crops	78	81.3
Mulching	71	74.0
Crop rotation	72	75.0
Planting on ridges	15	15.6
Adjusting planting dates	69	71.9
Shortening the length of growing period	35	36.5
Afforestation	85	88.5
Planting of shade and shelter providing trees	52	54.2
Changing land area cultivated	21	21.9
Improving soil conditions by natural deposits	81	84.4

Planting of cover crops to help conserve soil moisture	78	81.3

Source: Field survey, 2022 **Multiple responses**

Effectiveness of the mass media in communication mitigating strategies

Result in table 3 revealed that arable crop farmers indicated that the media were effective in communicating the following mitigation strategies; afforestation ($\bar{x}$=3.00), use of short gestation crops ($\bar{x}$=2.89), improving soil conditions by natural deposits ($\bar{x}$=2.82), crop rotation ($\bar{x}$=2.76), planting different varieties of crops ($\bar{x}$=2.75), planting of shade and shelter providing trees ($\bar{x}$=2.73), use of disease/pest resistant varieties ($\bar{x}$=2.58), planting of cover crops to help conserve soil moisture ($\bar{x}$=2.56), mulching ($\bar{x}$=2.54), etc. This implies that the media have been in the fore front of effectively delivering their responsibilities on climate change mitigation strategies among arable crop farmers.

Table 3: Response on effectiveness of the mass media in communication mitigating strategies

Mitigation strategies communicated (n = 96)	**VE**	**E**	**NE**	**Total score (TS)**	**Mean Score ($\bar{x}$)**	**Remarks**
Use of improved varieties						
Use of short gestation crops	87	78	2	277	2.89	VE
Use of flood tolerant crop	30	56	10	212	2.21	VE
Use of drought tolerant crops	45	29	22	215	2.24	VE
Use of disease/pest resistant varieties	60	32	4	248	2.58	VE
Planting different varieties of crops	75	18	3	264	2.75	VE
Portfolio diversification						
Diversifying from farm to non-farm activities	37	30	29	200	2.08	VE
Mixed farming	67	23	6	253	2.64	VE
Soil and water conservation						
Planting of cover crops	80	16	-	272	2.83	VE
Mulching	58	32	6	244	2.54	VE
Crop rotation	75	19	2	265	2.76	VE
Planting on ridges	18	20	58	152	1.58	NE
Changing planting dates						
Adjusting planting dates	63	24	9	246	2.56	VE

Shortening the length of growing period	18	24	54	156	1.63	NE
Planting Trees						
Afforestation	96	-	-	288	3.00	VE
Planting of shade and shelter providing trees	70	26	-	262	2.73	VE
Farmland management						
Changing land area cultivated	27	55	14	205	2.14	VE
Improving soil conditions by natural deposits	79	17	-	271	2.82	VE
Planting of cover crops to help conserve soil moisture	58	34	4	246	2.56	VE

Source: Field survey, 2022 ≥ 2.0 -Very Effective (VE); <2.0 -Not Effective (NE)

Constraints to communication and adoption of the mitigation strategies

Entries in Table 4 revealed that arable crop farmers agreed to all of the listed constraints as those militating against the communication and adoption of mitigation strategies. However, the most significant among them were lack of /inadequate extension programmes directed to meet the climate change mitigation strategies in food crop production ($\bar{x}$=3.50), illiteracy of the food crop farmer ($\bar{x}$=3.54), limited Government responsiveness to climate risk management ($\bar{x}$=3.47), poor access to climate change mitigation strategies information by food crop farmers ($\bar{x}$=3.49), lack of/ or inadequate government policies to empower food crop farmers ($\bar{x}$=3.47), high cost of irrigation facilities ($\bar{x}$=3.36), erratic power supply ($\bar{x}$=3.33), tedious nature of climate change mitigation strategies ($\bar{x}$=3.09), traditional beliefs/ practices e.g. on the commencement of farming season, crop festival period, etc ($\bar{x}$=3.05), norms, customs, culture, and traditional belief against mitigations ($\bar{x}$=2.92), involvement of the food crop farmers in some off farm jobs, e.g. trading, artisans etc. ($\bar{x}$=2.83). The results of lack of /inadequate extension programmes directed to meet the climate change mitigation strategies in food crop production agree with the study of Elenwa and Mbube (2018) that mentioned lack of agricultural extension programme as a primary constraint in mass media utilization for transfer of technologies in the development of rural communities of Ogoni nationality, Rivers State.

Table 4:Constraints to communication and adoption of the mitigation strategies

Constraints	VGE	GE	LE	VLE	Total score (TS)	Mean Score ($\bar{x}$)	Remarks
Lack of /inadequate extension programmes directed to meet the climate change mitigation strategies in food crop production	61	22	13	-	336	3.50	VGE
Illiteracy of the food crop farmer	61	28	5	2	340	3.54	VGE
Poor access to climate change mitigation strategies information by food crop farmers	50	43	3	-	335	3.49	VGE
Limited Government responsiveness to climate risk management	58	27	9	2	333	3.47	VGE
Erratic power supply	45	41	7	3	320	3.33	VGE
Tedious nature of climate change mitigation strategies.	43	25	22	6	297	3.09	VGE
Traditional beliefs/ practices e.g. on the commencement of farming season, crop festival period, etc	36	38	13	9	293	3.05	VGE
High cost of irrigation facilities	60	18	11	7	323	3.36	VGE
Norms, customs, culture, and traditional belief against mitigations	37	26	21	12	280	2.92	VGE
Lack of/ or inadequate government policies to empower food crop farmers	62	19	13	2	333	3.47	VGE
Involvement of the food crop farmers in some off farm jobs, e.g. trading, artisans etc.	37	21	23	15	272	2.83	VGE

Source:Field survey, 2022 ≥ 2.5- VGE=Very Great Extent; <2.5-VLE=Very little Extent

Socio-economic characteristics that influenced the use of mass media among arable crop farmers were determined as shown on table 5. The results of multiple regression model as presented in above table shows an R^2 value of 0.497 implying that 49.7% of the variation in the use of a selected mass media was explained by the independent variables. The p-value of (0.000) suggests that the regression model was statistically significant and lower than 0.05. The result revealed that level of education of arable crop farmers and cooperative membership were noticeably significant in influencing the usage of a specific mass media among arable crop farmers. This means that education level and cooperative membership significantly influences the use of mass media. An increase in educational level and cooperative membership will bring about an increase in the use of mass media amongst arable crop farmers. This finding is agrees with the finding of Elenwa and Ishikaku (2018) who found that education level of the respondents significantly influences different sorts of agricultural journalism i.e. internet website, cell phone services, magazine / newspaper / periodicals, social media, cable network, radio/F.M/television. Considering that only two (2) socio-economic characteristics out of the nine (9) socio-economic characteristics influenced the use of mass media, the null hypothesis which states that the use of mass media is not influenced by socio-economic characteristics of the arable crop farmers was upheld.

Table 5:Result of multiple regression on the influence of socio-economic characteristics on the use of mass media

Variables	Coefficients	t-value	Sig.
(Constant)	-0.330	-0.475	0.636
Sex	0.046	0.223	0.824
Marital Status	-0.021	-0.208	0.836
Age bracket	0.058	0.438	0.663
Educational Level	0.684	6.652	0.000**
Farming experience	0.196	1.372	0.174
Household Size	-0.163	-1.424	0.158
Income range	-0.031	-0.540	0.591
R-squared	0. 497		
Adjusted R-squared	0. 444		
F-Statistics	9.334		
F-Probability	0.000		

Source: Authors computation from SPSS/ ** - 0.05 level of significance, * - 0.10 level of significance

Conclusion and Recommendations

There were conscious efforts made by arable crop farmers to mitigate climate change. For example, most adopted improved crop varieties (especially growing different varieties of crops and those with short gestation period), portfolio diversification (especially practicing mixed farming and diversifying to non-farm activities), soil and water conservation (crop rotation, mulching and cover cropping), adjusting planting dates, and afforestation. Cost of device and peer group pressure significantly determines the use of a particular mass media.

Constraints that limited farmers' ability to adopt mitigation strategies included: lack of /inadequate extension programmes directed to meet the climate change mitigation strategies, illiteracy of arable crop farmer, limited Government irresponsiveness to climate risk management, poor access to climate change mitigation strategies information by arable crop farmers. Despite the constraints that arable crop farmers experienced in communication and adoption of the mitigation strategies, they made efforts to access information on climate change issues from radio and television. On the basis of the findings of this research, it was recommemded that extension agents need to receive new training on climate change because their primary role in agricultural extension work is advocacy. The provision of pertinent and trustworthy information to farmers will result from this, as it will provide extension agents with sufficient knowledge on climate change.

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