

Environmental Adult Education As An Instrument for Mitigating Climate Change on Farmer' Agricultural Products in Anambra State, Nigeria

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Abstract

Climate change has become a major challenge globally. In Nigeria, the impact of climate change is devastating due to its vulnerability and low coping capability. This study examined environmental Adult Education as an instrument for mitigating the impact of climate change on farmers' agricultural products in Anambra State, Nigeria. The study is a descriptive survey research design guided by two research questions. The population of the study consisted of 560 registered farmers who are members of a cooperative society. A sample of 230 respondents was drawn from the population using a simple random sampling technique. Questionnaire was the instrument for data collection. The validation was done by two experts from the Department of Adult education and Environmental Science, respectively. Cronbach alpha was used to determine the internal consistency of the instrument, which yielded a reliability coefficient of 0.78. Data collected were analyzed using the weighted mean. The findings revealed that climate change has negative impact on farmers' agricultural products in Anambra state. The findings further revealed different ways environmental adult education could help to mitigate the impact of climate change on farmer's agricultural products. The conclusion was drawn and recommendations made from the study. Some of the recommendations are that: seminars and workshops should be organized for farmers by adult educators periodically to enable them to acquire knowledge of ecological preservation, the government should mechanize agriculture to boost farmers' productivity, among others.

Key Words: Environmental Adult Education, Climate Change, Farmers, Agricultural Products.

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I. INTRODUCTION

Man and his environment cannot be separated from each other. Man depends on his environment for sustenance and existence. From time to time, changes in climate and environmental conditions occur as a result of natural and human factors. The natural factors are almost beyond human control but human factors are to a large extent under human control.

The world today has continued to be under the threat of climate change problems such as global warming, greenhouse gas effect, flooding, rising sea levels and temperature rising resulting in depletion of marine organisms, earthquakes, erosion, among others (Nwankwoala, 2015). Climate change refers to a long change in the average weather pattern over a significant period. Climate change according to United Nation Framework Convention on Climate Change UNFCCC, (2004) is the alteration in the composition of the global atmosphere through varied levels of human activities leading to the observed pattern of natural climate variability over a comparable time period. FAO (2008) defined climate change as a long – term changes of average weather conditions.

Nigeria for instance has been experiencing the effect of climate change with increased drought in the north and increased rainfall in the south. Beyioku (2016) opined that the experience of climate change disaster occurred 25 years ago in the north-eastern region, comprising Borno and Yobe states and the south eastern part of Lake Chad were farmlands and surrounding villages became barren and were swallowed by advancing desertification. This incident led to the massive migration of people in search of fertile land, like the Fulani herdsmen. In the south- eastern part of the country, gulley erosion has devastated many settlement areas and farmlands, leading to poverty among local communities. The author also noted that climate change in the region is also reflected in the massive flood experienced in 2012, 2015 and 2018 respectively, where houses, farms, farm products, properties and even human beings were submerged.

Scholars like Nwalieji and Uzuegbunam (2012) are of the view that climate change is caused by deforestation, bush burning, excessive use of agro- chemicals, firewood, extraction, soil erosion, among others, which could affect agricultural production. Since agriculture in Nigeria is entirely dependent on climate, and

changes in climate are bound to affect it greatly. It is pertinent to state that in Nigeria and particularly in rural communities, the traditional method of clearing farmland is through bush burning. Also, the use of firewood as a cooking energy source is still gaining prominence because of the high cost and non-availability of other sources such as natural gas. These activities however increase the concentration of greenhouse gasses in the atmosphere, increase heat and cause global warming. In Anambra state for instance, it seems that climate change has an enormous impact on farmers' agricultural products. Nwalieji and Uzuegbunam (2012) noted that the impact of climate change on farmer's agricultural products is seen in reduction in crops yield, destruction of farm lands by flood, high incidence of pests and diseases. Ochieng, Kirim and Mathenge (2016) corroborated that climate change brings about rise in temperature and precipitation becoming more unreliable with adverse impact on crop production leading to low income. Ehezue and Ezeala (2017) added that climate change impacts on agricultural production include: loss in biodiversity, conflict, communal crises and displacement of farming communities.

It is worthy to note that flooding is one of the most serious environmental problems in Anambra state. Over 30 percent of the inhabitants live along the riverine area and survive mainly on fishing and agriculture specifically Anambra West. Unfortunately, most of these flood-prone areas are places where the inhabitants carry out most of their agricultural activities.

Since education plays a vital role in creating and engendering awareness and also changing the way people view issues, environmental adult education needs to be taught to farmers to acquaint them with climate change and its devastating effects on farming so that abundant food production could be guaranteed.

Environmental adult education (EAE) is the type of education given to adults to enable them acquire relevant knowledge about their environment. It could take place in a non-formal setting. Nzeneri (2002) defined EAE as that type of education which identifies the impact of adult on the environment and how they can improve the quality of the environment. The objectives of EAE according to Mbalisi (2013) are:

1. To develop knowledge and understanding of the environment, the forces that contribute to its deterioration and how environmental quality could be improved.
2. To identify specific chemical, biological, physical, psychological and socio-cultural characteristics of the environment that consist of potential hazards to life and health
3. To develop skills for solving environmental problems, improving environmental quality and developing appropriate attitudes and sense harmoniously with his environment.

Farmers who are mainly adults are the segment of the population that make use of the environmental resources for a living. They, therefore, need environmental adult education to gain knowledge, skills and attitudes to maintain the ecological balance in order to improve their yield for a better quality of life.

In support of the above, Bullen and Otse (2012) asserted that EAE helps in creating awareness and appreciation on ecological system and how they work. Through awareness creation, the farmers could be sensitized on ways to conserve the environment so as to improve their agricultural products.

Statement of the Problem

A man usually depends on his environment for existence and sustenance, such that man's life is shaped by his environment. This underscores the need for the protection of the environment from all forms of degradation especially those brought about by climate change. Climate change has become one of the environmental changes globally. The researcher has observed that the world has continued to be under the threat of climate change problems like global warming, flooding, greenhouse gas effect, rising sea level, sea temperature resulting in depletion of marine organisms, earthquake, erosion, pollution, among others.

In Anambra state for instance erosion, pollution and particularly flood are being experienced in many parts of the state. For example, the flood that occurred in 2012, 2015 and 2018 respectively, led to the destruction of lives and properties, many people were displaced and hectares of land were submerged, the resultant effect was poor agricultural output.

Despite efforts made by successive governments to address this menace, the problem continues to repeat itself each year. Hence, the need to conduct the study on environmental adult education as an instrument for mitigating climate change on farmer's agricultural products in Anambra state.

Research Questions

The following research questions guided the study.

1. What is the impact of climate change on farmers' agricultural products in Anambra state?
2. To what extent does EAE mitigate the impact of climate change on farmers' agricultural products?

II. METHODOLOGY

The study adopted a descriptive survey research design. The population of the study consisted of 560 registered farmers of a cooperative society. A sample size of 230 farmers was drawn using a simple random sampling technique. The questionnaire was the instrument for data collection which was validated by two

experts. Cronbach alpha was used to determine the internal consistency of the instrument which yielded a reliability coefficient of 0.78 which was considered appropriate for the study. The questionnaire consisted of 15 items with response category of Strongly Agree (SA) = 4 points, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1 on research question one while Very High Extent (VHE) = 4, High Extent (HE) = 3, Low Extent (LE) = 2 and Very Low Extent (VLE) = 1 for research question two. The decision rule was 2.50 on research question one, which means that any mean score which had 2.50 and above indicated agreement while any mean score below 2.50 meant disagreement for each item.

Consequently, in research question two, the following boundary limits were used: 1- 1.49, Very Low Extent (VLE), 1.5 –2.49 Low Extent (LE), 2.5 – 3.49 High Extent (HE) and 3.5 – 4.00 Very High Extent (VHE).

Analysis of Results

Research Question 1: What is the impact of climate change on farmers' agricultural products?

Table 1: Mean Responses of Respondents on the Impact of Climate Change on Farmers' Agricultural Products

S/No	Impact of Climate Change	N=230				Total	X	Remarks
		SA 4	A 3	D 2	SD 1			
Climate change brings about:								
1.	Poor crop variety	170 680	45 135	15 30	0 0	845	3.67	Agree
2.	Disruption of food availability	168 672	40 120	13 26	9 9	827	3.60	Agree
3.	Loss of farmland	162 648	35 105	22 44	11 11	808	3.51	Agree
4.	Displacement of farming communities due to flooding	169 676	61 183	0 0	0 0	859	3.73	Agree
5.	Loss in income	200 800	28 84	2 4	0 0	888	3.86	Agree
6.	Irregular crop planting and Harvesting	176 704	34 102	16 32	4 4	842	3.66	Agree
7.	Loss in the GDP of the country	212 848	18 54	0 0	0 0	902	3.92	Agree
8.	Extinction of some important crops	198 792	20 60	12 24	0 0	876	3.80	Agree
9.	Communal crises	174 696	48 144	8 16	0 0	856	3.72	Agree
Grand Mean							3.72	Agree

The result in table 1 revealed that all the items were above the criterion mean of 2.5. This means that all the items were agreed upon by the respondents as the impact of climate change on their agricultural products. Similarly, the grand mean of 3.72 was equally an indication of agreement. This therefore, indicates that climate change has a huge impact on farmers' agricultural products in Anambra state.

Research Question 2: To what extent does EAE mitigate the impact of climate change on farmers' agricultural products?

Table 2: Mean Responses of Respondents on the Extent Environmental Adult Education Mitigate the Impact of Climate Change on Farmers' Agricultural Products
N=230

S/No	Items	VHE(4)	HE(3)	LE(2)	VLE(1)	Total	X	Remarks
To what extent does:								
10.	Environmental Adult Education(EAE) educates farmers on planting flood resistance trees	158 632	49 147	14 28	9 9	816	3.55	VHE
11.	EAE organizes farmers to improve their knowledge on the impact of climate change	169 676	58 174	3 6	0 0	856	3.72	VHE
12.	Outreach programme for illiterate farmers on the dangers of bush burning, deforestation and overgrazing helps farmers improve their crop yield	137 548	69 207	13 26	11 11	792	3.44	HE
13.	EAE enables farmers to take part in decision making on climate change	120 480	96 288	10 20	4 4	792	3.44	HE
14.	EAE helps farmers to know the effective and good farming practices such as crop rotation	156 624	62 186	12 24	0 0	834	3.63	VHE
15.	EAE helps to create awareness on how farmers could use the multi-media system to control flooding	145 580	82 246	3 6	0 0	832	3.62	VHE
Grand Mean							3.57	VHE

The result in table 2 indicated that items 10, 11, 14 and 15 were within the decision rule of Very High Extent (VHE,) while items 12 and 13 fell within the decision rule of High Extent (HE). Also, the grand mean was within the decision rule of a Very High Extent. This is an indication that the farmers rated that EAE mitigate the impact of climate change to a Very High Extent.

III. DISCUSSION OF RESULTS

Findings from research question 1 showed that climate change has a negative impact on farmers' agricultural products in Anambra state. This finding is in line with Nwalieji and Uzuegbunam (2012) who stated that the impact of climate change on agricultural products was experienced in the reduction of crop yield, destruction of farmland, and high incidence of pests and diseases. This was the reason Enete and Amusa (2010) stressed that climate change was the most serious environmental threat to the fight against hunger, malnutrition and poverty in Africa due to its impact on agricultural production. Eheazu and Ezeala (2017) added that the impact of climate change on agricultural products was observed in loss in biodiversity, conflict or communal crises and displacement of farming communities. Flooding which is one of the most serious environmental challenges in Anambra state has adverse impact on farmers' crop production which invariably affects their income. It became necessary that farmers should be trained on environmental issues to avert the situation in order to boost their yield.

Findings from research question 2 revealed that EAE could mitigate the impact of climate change on farmers' agricultural products to a very high extent. The finding supports the views of Bullen and Otese (2012) that EAE helps in creating awareness and appreciation on ecological system and how they work. This means that EAE creates awareness to farmers on how to conserve their environment by avoiding deforestation, overgrazing and the need to plant flood resistance trees. Also, through EAE, farmers are sensitized on the effect of bush burning and excessive use of agro- chemicals. Anijah – obi (2001) corroborated that EAE helps farmers to develop the sense of responsibility about their environment probably because farmers are mainly adults and are mostly involved in depletion of their environment.

IV. Conclusion

The study discovered that climate change has a huge impact on farmers' agricultural products in Anambra state. It has also shown clearly the different ways EAE could help mitigate the impact of climate change on farmers' agricultural products. The paper has revealed that EAE could equip farmers with relevant knowledge on how to preserve and sustain their environment. Some useful recommendations were proffered that could help make the environment conducive for farmers in order to improve on their yield.

V. RECOMMENDATIONS

In the light of the above discourse, the following recommendations are made:

1. Seminars and workshops should be organized for farmers by adult educators periodically to enable them to acquire knowledge of ecological preservation.
2. The state government should collaborate with adult educators in using the multimedia system to create awareness on how to control flooding.
3. The state government should release funds for the purchase of agricultural inputs and the inputs be distributed free to farmers.
4. There is a need for the state government to mechanize agriculture to boost farmers' productivity.
5. Extension agents should educate farmers on effective and good farming practices, such as crop rotation.

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