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Perceived effectiveness of Anambra state government, Nigeria in combating climate change

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Abstract
The study determined the perceived effectiveness of the Anambra State Government, Nigeria in combating climate change. One research question was formulated to guide the study and one null hypothesis was tested at 0.05 level of significance. The study used a descriptive survey research design. The population of the study was made up of 317 stakeholders (105 staff of the Ministry of Environment, 177 Presidents General/Caretaker Chairmen, and 35 staff of Non-Governmental Organizations) in the area of environmental sustainability in Anambra State, Nigeria. No sampling was done because the population was manageable. The reliability of the instrument was carried out using 15 stakeholders in the Ministry of Environment, Association of Town Unions and NGOs in Enugu State. The data collected were analyzed using Cronbach alpha. The analyses showed that the instrument has a reliability of 0.89 which was accepted as reliable. A 9 item questionnaire was developed to elicit information from the respondents. The questionnaire was divided into two parts, A and B. Part A focused on the personal data of the respondents while Part B focused on items addressing the research question. The instrument was validated by three experts from the Departments of Educational Foundations, Science Education, and Adult and Continuing Education respectively in Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. The instrument was distributed and collected by the researchers through the assistance of two research assistants. The data collected were analyzed using mean and analysis of variance (ANOVA). Post hoc analysis was conducted using bonferroni test for multiple comparisons**.** The finding of the study showed that the respondents perceived the Anambra State Government as ineffective in combating climate change. The study equally revealed that the staff of the Ministry of Environment, Presidents General/Caretaker Chairmen, and staff of the Non-Governmental Organizations differed significantly in their mean ratings on the effectiveness of the Anambra State Government in combating climate change. Based on the findings, it was concluded and recommended, among others, that the Anambra State Emergency Management Agency and other environmental friendly agencies should extend their functions to the rural areas.

Keywords: Perceived, effectiveness, combating, climate change, Anambra sate

Introduction

Climate change is a change in climate overtime, whether due to natural variability or as a result of human activity. It refers to long term shifts in temperatures and weather patterns. Such shifts can be natural due to changes in the sun's activity. Specifically, human activities have been the main drive of climate change due to the burning of fossil fuels such as coal, oil and gas (United Nations, 2023) [20]. Climate change is a change in the state of the climate that can be identified by changes in the mean or the variability of its properties and that persists for an extended period (IPCC, 2018).

Climate change impacts the society by disrupting the natural, economic and social systems people depend on. This disruption will affect food supplies, industry supply chains and financial markets, damage infrastructure and cities, and harm human health and global development. Climate change will make people to lose jobs as impacts on agriculture and other sectors increase. Temperature changes will increase people's exposure to food-borne, water-borne and insect-borne diseases. Rising waters and storms will damage infrastructure, interrupt transportation and will equally cause long-lasting power outages. Communities with fewer resources will be hit hardest (IPCC & US Global Change Research Programme, 2017). Thus, it is of great importance to combat climate change so as to protect the natural, economic and social systems people depend on.

Combating climate change refers to the practical things that people or governments can do to reduce the impacts of threats to the environment which impacts people livelihoods particularly the marginalized. Such threats include desertification, flooding and droughts, among others. It aims to reduce the impacts of flooding and natural changes in climate which affects food production by providing sensitization programme on climate change in communities and schools (One Million Women, 2016) [15]. In this study, combating climate change implies all the practices and measures that individuals, concerned agencies, communities, non-governmental and governmental organizations can put in place to mitigate the impacts of drought, flooding, fire outbreak and other disasters, specifically to boost agricultural produce and promote a healthy environment.

It is very important to combat climate change because increases in pests and diseases and more frequent and intense droughts and floods, reduce the availability of food. Heat stress causes poor yields and crop failures. Reducing short-lived climate pollutants gives people best chance to rapidly limit global temperature rise and reduce the risks to food security (Climate & Clean Air Coalition, 2019). Short-lived climate pollutants are black carbon, methane, hydro fluorocarbons and tropospheric ozone. They are powerful climate forcers with global warming potentials many times more than carbondioxide.

According to Climate and Clean Air Coalition (2019), these pollutants significantly impact air quality, food, water and economic security directly (through their negative effects on public health, agriculture and ecosystems) and indirectly (through their impact on the climate). Many of the impacts of climate change such as floods and drought are experienced at the local level (Rauken *et al*., 2015) [18]. In 2012, flooding led to two million displacements and three hundred and sixty-three (363) deaths in Nigeria. In 2017, 12 states, including Anambra State in the Southeast were affected, leading to 200 deaths and over 600,000 displacements (Orji, 2018) [17]. As climate change leads to more rainfall, floods are becoming more devastating, especially in Anambra State.

People living in Nigeria are being ravaged by flood and gully erosion. Serious havoc in the forms of heavy rainfall, heavy wind, floods and destruction of homes, especially the destruction of rooftops as a result of heavy winds were forecasted (Daily Trust Newspaper, 2011) [3]. The menace of gully erosion in Agulu-Nanka area of Anambra State has led to the declaration of that area as an ecological disaster zone by the Federal Government of Nigeria (Ajaero & Mozie, 2010) [1]. The government of Anambra State in its sensitivity to the menace of erosion in the state awarded contracts for building of drainages, culverts, embankments and had carried out some engineering construction works aimed at checking erosion.

The government of Anambra State equally planted 2 million economic and erosion control trees aimed at reducing some ecological problems in the state (Eneh, 2014) [6]. Enlightenment campaigns were carried out by concerned agencies to sensitize the indigenous population of erosion ravaged locations on alternative land use-practices that can curtail or limit erosion (Eneh, 2014) [6]. Despite all the efforts made by the government of Anambra State, ecological problems in the state seem not to abate. This shows that more sensitization programmes on floods and erosion need to be carried out by the concerned agencies to reduce the present menace of gully erosion in the state.

In Anambra State, there are agencies set up for combating climate change such as: National Emergency Management Agency (NEMA), State Emergency Management Agency (SEMA), National Erosion and Watershed Management Project (NEWMAP), State Ministry of Environment and Federal Ministry of Environment. According to Reliefweb (2012) [19], the National Emergency Management Agency (NEMA) in collaboration with State Emergency Management Agency in 2012 inaugurated disaster risk reduction and management club in 10 post primary schools to take emergency preparedness and response to the grassroots and to inculcate disaster consciousness in the children and youths of the state. The programme was designed to instill in them the culture of risk identification, reduction, preparedness and mitigation in their formative years. Children and youths are potential leaders and the formation of disaster risk reduction and management club would imbibe in them the requisite knowledge to make local communities resilient.

However, disaster risk reduction measures continue to be inadequately integrated into the framework development policies and strategies at various levels in the state while poor implementation of those that exist has grave consequences for food security, economic growth, poverty reduction and attainment of sustainable development. Furthermore, with an operational disaster management institution as SEMA within Anambra State, one can easily assume that disaster occurrence within the state will be minimal as they will be prevented, and that the negative effects of disasters will be relatively bare. However, this is not so as in the opinion of Efobi and Anierobi (2013), not much has been achieved by SEMA or even its national counterpart -NEMA in Anambra State other than supply of relief materials. Disaster management in Anambra State has been alleged to be ineffective, slowly responsive and post-disaster occurrence inclined (Nwabineli, cited in Obioji & Eze, 2019) [11].

Similarly, the Anambra State Emergency Management Agency in its effort to mitigate the impacts of climate change distributed relief materials to the victims of a collapsed building in Onitsha, the commercial nerve centre of the state. The relief materials distributed include mattresses, blankets, insecticide and treated mosquito nets. These provided succor to the victims of the collapsed building. Moreover, the National Erosion and Watershed Management Project helped the Anambra State government to create awareness on good habits that would curb erosion in communities. Farming practices that distort soil and make it susceptible to disintegration when it comes in contact with moisture were discouraged. In addition, sensitization and information sharing campaigns had been mounted for community members (Traditional rulers, presidents general and other critical interest groups) on issues of flooding, erosion, indiscriminate dumping of refuse and blockage of drains (Okafor, cited in International Centre for Investigative Reporting, 2020). The Anambra State Ministry of Environment encouraged people to construct catchment pits in their compounds and to stop interlocking which aids run-off. The Ministry also championed the incorporation of climate change into the curricula of all levels of education to inform young children with the message that would help to preserve the coming generation.

Other preventive measures embarked by the state government include: Setting up a taskforce for proper scoping and execution of development projects, campaign against indiscriminate building and erection of structures on water ways and launch of one million tree planting initiative to provide natural cover for the soil (Okafor, cited in International Centre for Investigative Reporting, 2020). Trees take in carbon dioxide and give out oxygen which human beings need. Removing carbon dioxide from the atmosphere causes greenhouse gases which will lead to climate change (Ivenso, cited in International Centre for Investigative Reporting, 2020). Furthermore, the government of Anambra State had shared useful and timely information with farmers to build their capacities for optimal productivity. Most of the flood prone places practise dry season farming. Farmers in the areas plant short duration crops such as rice, sweet potatoes, vegetables, corn, okro, pepper and others which they can harvest two to three times (Uzoka, cited in International Centre for Investigative Reporting, 2020).

In addition, the environmental issues such as erosion, flooding, poor public environmental awareness and deforestation contribute to ozone layer depletion (Okoye, 2017) [14]. Ozone layer is a region in earth's atmosphere which contains relatively high concentrations of ozone. The State Ministry of Environment partnered with the Federal Ministry of Environment to see that old fridges and radios are carted away because they emit some gases that affect the ozone layer (Okafor, cited in International Centre for Investigative Reporting, 2020). From the observation of the

researcher and literature, it seems that the government has not made enough effort to create adequate awareness on ozone layer depletion and its effects on human life.

Over the years, soil conservation measures aimed at land-use management were introduced to peasant farmers in Anambra State to inform them on methods to use to improve the quality of soil. Sustainable development in agriculture in Nigeria has been threatened by environmental degradation arising from soil erosion menace (Onu, 2013) [16]. In Anambra State, almost all the communities are affected by one form of erosion or the other. According to Okorafor, Akinbile, and Adeyemo (2017) [13], this has affected the livelihood of farmers in variety of ways including loss of arable farms and loss of income. Thus, farmers can use simple methods of erosion control which are less expensive and less laborious to improve the quality of soil. Simple methods such as cover crops can improve soil structure thereby decreasing the credibility of the soil (Okorafor, Akinbile & Adeyemo, 2017) [13].

To combat climate change successfully, there is a need to assess ongoing programmes and projects in order to build capacity, develop skills, attitudes and values and take collective actions toward empowering and building communities for effective community development. Community development is an area of adult and continuing education which aims at education for effecting meaningful changes in the lives of community members, empowerment and transformation of communities, and impacting on their livelihood for sustainable development. It covers not just cognitive aspect of human development but affective and psychomotor which is acquired through sense of shared purpose and fellowship. Shared sense of fellowship enables community members to value one another and pursue the interests of the community more than personal interest and gains. Adult education covers all areas of maturity for continuous human development which include psychological, social, economic and spiritual dimensions, among others (Obidiegwu, 2022) [10].

The respondents for this study were made up of staff of the Ministry of Environment, Presidents General / Caretaker Chairmen and staff of some Non-Governmental Organizations (NGOs). These groups of people are stakeholders in environmental sustainability. These groups may differ in their opinions on the effectiveness of Anambra State Government, Nigeria in combating climate change. Such differences or similarities in opinions when analyzed will be used to ascertain the effectiveness of Anambra State Government in combating climate change for better planning, forecasting and decision making towards individual, community, and national development.

Purpose of the Study

The purpose of the study was to determine the perceived effectiveness of the Anambra State Government in combating climate change. Specifically, the study sought to determine the perception of the staff of the Ministry of Environment, Presidents General / Caretaker Chairmen and NGOs on the effectiveness of the Anambra State Government in:

1. Combating climate change.

Research Question

One research question guided the study; on the perceptions of the staff of the Ministry of Environment, Presidents General/Caretaker Chairmen, and NGOs:

1. How effective is Anambra State Government in combating climate change?

Research Hypothesis

A null hypothesis (H_0) was tested at 0.05 level of significance

1. There is no significant difference among the Staff of the Ministry of Environment, Presidents General / Caretaker Chairmen and Staff of the NGOs on the effectiveness of the Anambra State Government in combating climate change.

Materials and Methods

The study adopted a descriptive survey research design. The study was conducted in Anambra State of Nigeria. The major occupation of the area is commerce. Onitsha is the commercial hub of the state while agriculture is the main activity of the rural dwellers (Ogbaka, 2016) 12[]. The population of the study was made up of 317 stakeholders (105 Staff of the Ministry of Environment, 177 Presidents General / Caretaker Chairmen and 35 Staff of the four NGOs) in the area of environmental sustainability in Anambra State. No sampling was done because the population was manageable. The instrument used for data collection was a questionnaire. It was titled ‘‘Perceived Effectiveness of the Government in Combating Climate Change Scale (PEGCCCS)”. The instrument was divided into two parts, A and B. Part A (contains 3 items) focused on the personal data of the respondents while Part B (contains 9 items) focused on items addressing the research question. It focused on activities necessary for combating climate change. Each of the items has 4-point response categories as follows: Very Effective (VE); Effective (E); Slightly Effective (SE) and Ineffective (I). The instrument for the study was validated by 3 experts in the Department of Adult and Continuing Education, Department of Educational Foundations (Measurement & Evaluation Unit) and Department of Science Education in the Faculty of Education, Nnamdi Azikiwe University, Awka.

The reliability of the instrument was carried out using 15 stakeholders in the Ministry of Environment, Association of Town Unions and NGOs in Enugu State (5 stakeholders in each case). The state was used because they share the same characteristics with the area of study. The data collected were analyzed and the internal consistency of the instrument was determined using Cronbach alpha. The coefficient alpha analysis yielded reliability of internal consistency of 0.89. The researchers administered 317 copies of the questionnaire to the respondents with the help of two research assistants (a Staff of Ministry of Environment, a staff of Anambra State Association of Town Unions and a Staff of the NGOs) who are stakeholders in environmental sustainability in Anambra State. The copies of questionnaire which were completed and returned were 302 copies (95.3%) while 15 copies (4.7%) were lost. The researcher used the 302 copies which were returned for the analysis. Mean and analysis of variance (ANOVA) were used for analyses. Mean was used to analyze the data on the research question while the ANOVA was used to test the null hypothesis at 0.05 level of significance. Analysis was done using Special Package for Social Sciences (SPSS) version 25. Post hoc analysis was carried out using Bonferroni test for multiple comparisons. Frequencies and percentages were

used to analyze the information on personal data of the respondents

The decision rule was based on the boundary true limit of the four-point response categories as follows:

Response Categories	Rating Point limits	Boundary
Very Effective	4	3.50-4.00
Effective	3	2.50-3.49
Slightly Effective	2	1.50-2.49
Ineffective	1	1.00-1.49

Anambra State Government was considered effective in any item which scored 2.50 mean point and above while ineffective in any item that scored below 2.50. A null hypothesis was accepted at 0.05 level of significance if the *F* value was less than the value of significance (P value) or otherwise, the null hypothesis was rejected.

Result

Research Question One: How effective is Anambra State Government in combating climate change

Table 1: Mean Ratings of the Respondents on the Perceived Effectiveness of Anambra State Government in Combating Climate Change (N=302)

S/N	Items	SME (*N* = 90)	PGs/CTC(*N* = 177)	SNGOs (*N* = 35)	Total (*N* = 302)	
		Mean	Mean	Mean	Mean	Remark
1	Creating awareness on desertification and tree planting by organizing seminars for community members	2.70	2.41	2.81	2.64	Effective
2	Creating awareness on flooding and ways to avert same by organizing sensitization programmes	2.39	1.80	2.64	2.27	Ineffective
3	Creating awareness on droughts and water management to improve food production by organizing workshops for farmers	2.41	1.85	2.56	2.27	Ineffective
4	Setting up irrigation through appropriate technology by training farmers to take ownership of the existing irrigation system	2.26	1.71	1.75	1.90	Ineffective
5	Informing peasant farmers on methods to use for improving the quality of soil by organizing training programmes	2.39	1.80	2.31	2.16	Ineffective
6	Creating awareness on ozone layer depletion and its effects on human life by organizing seminars for community members	1.85	1.65	2.06	1.85	Ineffective
7	Implementing disaster risk reduction strategies in all communities in the state by inaugurating disaster risk reduction and management club to sensitize the children and youths of the state	2.08	1.76	1.86	1.90	Ineffective
8	Integrating ways to combat climate change in the curricular for all levels of students to create wider awareness	1.94	1.83	1.92	1.89	Ineffective
9	Building capacity among community members for effective climate management by sharing useful information concerning climate management with them	1.90	2.10	1.75	1.91	Ineffective
	Total mean score				2.08	Ineffective

SME=Staff of Ministry of Environment, PGs/CTC=Presidents General/Caretaker Chairmen, SNGOs=Staff of Non-Governmental Organizations

With reference to the decision rule, Table 1 shows that the Anambra State Government was not effective in 8 items. They were only effective in 1 item. The grand mean of 2.08 corroborates this remark. Therefore based on the decision rule, the Government was ineffective in combating climate change.

Test of Hypothesis

Ho1: There is no significant difference among the Staff of the Ministry of Environment, Presidents General/Caretaker Chairmen and Staff of the NGOs on the effectiveness of the Anambra State Government in combating climate change.

This hypothesis is tested in Table 2.

Table 2: ANOVA on Perceived Effectiveness of the Anambra State Government in Combating Climate Change

		Sum of Squares	df	Mean Square	F	Sig.	ta-squared (ηp2)	Remark
Combating Climate Change	Between Groups	7.751	2	3.876	18.145	<.001	0.109	Significant
	Within Groups	63.438	300	.214				
	Total	71.189	302					

Table 2 indicates that the Staff of the Ministry of Environment (*N* = 90; *M* = 2.2144; SD =0.46), Presidents General / Caretaker Chairmen (*N* = 177; *M* = 1.8787; SD =0.46) and the Staff of NGOs (*N* = 35; *M* = 2.1821; SD =0.46) differed significantly in their mean ratings on the effectiveness of the Anambra State government in combating climate change, $F(2,302) = 18.145$, $p = 0.001$, ηp2 =0.109. Post hoc analyses as presented in Table 3 indicates significant differences in the mean ratings on the effectiveness of the Anambra State Government in combating climate change between Staff of the Ministry of Environment and Presidents General / Caretaker Chairmen; and between Presidents General / Caretaker Chairmen and Staff of NGOs ($p < 0.05$). However, significant differences did not occur between Staff of the Ministry of Environment and Staff of NGOs ($p > 0.05$).

Table 3: Post Hoc on Perceived Effectiveness of the Anambra State Government in Combating Climate Change

Multiple Comparisons						
Dependent Variable: Combating Climate Change						
Bonferroni						
(I) PDR	**(J) PDR**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
					Lower Bound	**Upper Bound**
Staff of the Ministry of Environment	Presidents General / Caretaker Chairmen	.33571*	.06051	<.001	.1900	.4814
	Staff of NGOs	.03230	.09159	1.000	-.1882	.2528
Presidents General / Caretaker Chairmen	Staff of the Ministry of Environment	-.33571*	.06051	<.001	-.4814	-.1900
	Staff of NGOs	-.30341*	.08450	.001	-.5069	-.1000
Staff of NGOs	Staff of the Ministry of Environment	-.03230	.09159	1.000	-.2528	.1882
	Presidents General / Caretaker Chairmen	.30341*	.08450	.001	.1000	.5069
*. The mean difference is significant at the 0.05 level.						

Discussion of Findings

Analysis in Table 1 showed that the Anambra State Government was ineffective in combating climate change. The finding is in line with Efobi and Anierobi (2013) [5] who stated that not much has been achieved by SEMA or even its national counterpart-NEMA in Anambra State other than supply of relief materials. Disaster management in Anambra State has been alleged to be ineffective, slowly responsive and post-disaster occurrence inclined (Nwabineli, cited in Obioji & Eze, 2019) [11]. This shows that more sensitization programmes on floods and erosion need to be carried out by the concerned agencies to reduce the present menace of gully erosion in the state in order to combat climate change effectively.

The null hypothesis revealed that the staff of the Ministry of Environment, Presidents General / Caretaker Chairmen and staff of the NGOs differed significantly in their mean ratings on the effectiveness of the Anambra State Government in combating climate change. However, post hoc analyses indicated significant differences in the mean ratings between staff of the Ministry of Environment and Presidents general /Caretaker Chairmen; and between Presidents General/ Caretaker Chairmen and staff of the NGOs. However, significant difference did not occur between the staff of the Ministry of Environment and staff of the NGOs.

Conclusion

Based on the findings, it was concluded that the Anambra State Government was ineffective in combating climate change. The study also showed that the Staff of the Ministry of Environment, Presidents General/ Caretaker/Chairmen and Staff of the NGOs differed significantly in their mean ratings on the effectiveness of the Anambra State Government in combating climate change. Thus, the efforts of the Anambra State Government should be doubled to achieve the targets of the goal as contained in the UN document which will help to achieve the goal in Anambra State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The Anambra State Emergency Management Agency and other environmental friendly agencies should extend their functions to the rural areas.
2. Standard gutters/channels should be constructed at the erosion sites or strategic locations by the Anambra State Erosion Watershed Climate Change Agency to prevent gully erosion across the state.
3. The Anambra State Government should organize seminars and workshops periodically to educate communities and vulnerable people on environmental threats such as erosion, flooding and pollution of all kinds.
4. Disaster risk reduction measures should be integrated into the framework development policies and strategies at various levels in the state by the Anambra State government.
5. Anambra State Association of Town Unions should partner with the Anambra State Erosion and Watershed Climate Change Agency to strengthen the fight against environmental hazards in the

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