CLIMATE CHANGE AND RISK OF VIOLENT CONFLICT IN NEMBE LOCAL GOVERNMENT AREA, BAYELSA STATE

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Abstract
Considering the reality that climate change is a dead trap to millennium developments goals in Nigeria; this study decided to investigate the nexus between climate change and violent conflict in oil producing Niger Delta, with particular emphasis on Nembe Local Government Area, Bayelsa State. The resource scarcity model and frustration aggression theory served as the theoretical framework for the study. The cross-sectional and co-relational study design provided the study design for the study, while probability (simple random) and non-probability (purposive) sampling techniques were used for the sampling procedures. Using Taro Yamane formula, the study sampled a total of 399 respondents. However, 200 copies of questionnaire representing 50.1% were found valid for the study. Data for the study were collected through structured questionnaire on the basis of five point Likert scale. The analysis of the data collected for the study was subjected to descriptive and inferential statistical analysis using statistics like; percentages, frequency distributions, mean, standard deviation, Binary logistics and Pearson correlation test of relationship. Based on analysis, the study concluded that climate change correlated with violent conflict in the study area. Hence, the following recommendations were made; government should intensify effort in building adaptive mechanism to climate change, anthropogenic factors such as gas flaring, oil bunkering and indiscriminate bush burning should be abhorred, among others.

Keywords: *Climate change, Environmental Degradation, Resource Scarcity, Violent Conflict.*

Introduction

Climate change is a dead trap to the United Nations Millennium Development Goals (MDGs) declared in the year, 2000. Climatologists have expressed concern that Nigeria is on a siege; with the unabated exploitation of environmental resources. In 2010, the Nigerian government labeled climate change as the "greatest environmental and humanitarian challenge facing the country" for the 21st century (Werz & Conley, 2012). Ibaba (2012) earlier warned that climate change is a global phenomenon but its impacts are localized impacting on communities, without regard to who contributed to it. The link between the duo (climate change and conflict) is further heightened by the risk posed by rise in sea level; a situation that characterize apocalypse society. It is noted for instance that a 0.2-meter rise in sea level would lead to the displacement of about 200 villages in the Niger Delta region, while projected sea level rise of more than 1 meter could flood much of the Niger Delta and force up to 80% of Delta's population to higher ground (Uyigue & Ogbeibu, nd). Thus conflict becomes imminent in the face of scarcity of resource in meeting nutritional needs. The unabated clash between farmers and herdsmen are legacies of climate change; as deforestation has made the encroachment of herders to farmland inevitable. Furthermore, these environmental refugees seek gruesome fierce means of aggression in addressing these challenges. Thus, it is not surprising that environmental terrorism has been added to Niger Delta literature.

Statement of the Problem

Climate change appears to worsen water borne diseases with severe consequences on income level. Put together, poor health condition, low income, hunger, scarcity of natural resources are all conflict drivers, particularly in the Niger Delta where violence is the effective means of communication (Omere, 2018). Nafziger (2006) has noted for instance that poverty creates conditions that support violence by fueling discontent and grievance. In attempt to consolidate peace building through adaptation; Ibaba (2012) in his Monograph titled "Climate Change and the Risk of Violent Conflict in Post-Amnesty Niger Delta", pointed out the link between declining environmental resources and conflict driven by climate change. Etekpe (2007) after 16 years' effortful study in his text titled "The Politics and Conflict over Oil and Gas in the Niger Delta Region: The Bayelsa state Experience" reported that 86.6 percent of conflict is traceable to oil and gas.

Equally disturbing, is the fact that earlier studies relied heavily on secondary data in making analytical description of the presumed relationship between variables. Thus giving little or no attention to primary data derived from the presumed study locale. Previous studies also failed in considering the peculiarity of different communities, with reference to the nature or degree of conflict that exist. Instead, it chose to make it look like the entire communities that constitute Niger Delta are engulfed in conflict; which is debatable. Consequent upon these inconsistencies, the current study tends to adopt primary data with advanced statistical tools in investigating the correlational effect of climate change on violent conflict in Nembe Local Government Area, Bayelsa state.

Aim and Objectives

The aim of this study is to investigate the impact of climate change on violent conflict, the specific objectives are to:
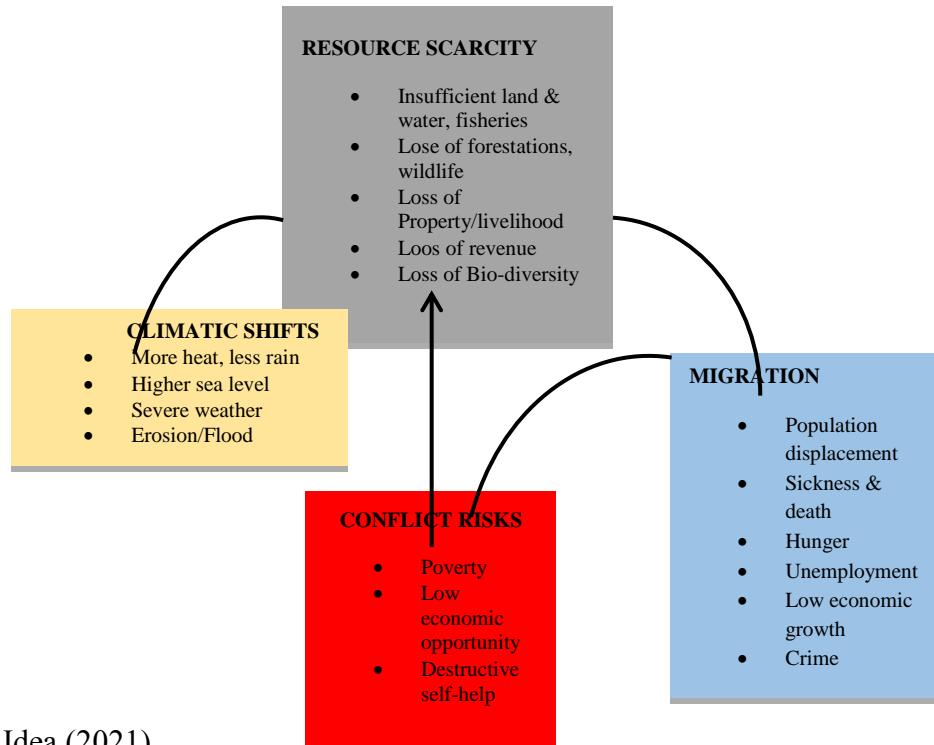
i.   find out the impact of climate change on environmental degradation;
ii. investigate the role of climate change on resource scarcity;

iii.   discover if climate change is a conflict driver in Nembe Local Government Area; and
iv.   identify the threats posed by climate change to Millennium Development Goals (MDGs).

Study Hypotheses

Ha1: Socio-demographic characteristics of respondents play a role in violent conflict.
Ha2: Climate change is associated with environmental degradation.
Ha3: Climate change correlates with violent conflict.

Conceptual Framework

Source: Author's Idea (2021)

The above diagram clearly portrays climate change as a conflict multiplier. It is indicative that rise in sea level, deforestation, more heat, less rain, severe weather, water pollution and overall decline in agricultural output drives poverty indices prevailing in the Niger Delta region. Excessive flood in rural area drives the migratory pattern of farmers. This further complicates the unemployment challenges in urban areas. With attendant less socio-economic growth, hunger and crime becomes imminent. Thus, creating fertile ground for discontent, frustration and conflict; by and large, resource scarcity cannot be isolated from climate change. It is noteworthy, that climate change does not create conflict but serves as conflict multiplier, as it creates an environment that thrive conflict situations.

Methodology

The study adopted the design that is based on the number of contacts, which is the cross-sectional design, most often it is referred to as one-shot study. In this light it provided the possibility of understanding climate change as a conflict multiplier on the basis of data that were collated from respondents. Also based on the objective of study, the co-relational design provided the basis in determining the co-relational effect between climate change and risk of violent conflict with reference to Nembe Local Government Area, by taking a cross-section of population at once. The study population constitute inhabitants (both sexes) of Nembe

Local Government Area. In determining the population, the study adopted the report presented by the National Bureau of Statistics (NBS) in 2012. According to this report, the total (both sexes) population of Nembe, Local Government Area in the year 2006 is given as 130,966. However, the Taro Yamane formula was used in determining a sample size of 399. Given the nature of study, the probability and non-probability sampling techniques were adopted for this study. Firstly, the simple random sampling technique was used to sample eight communities out of the thirty-seven villages that constitute Nembe Local Government Area. In this wise, the researcher(s), wrote the names of the thirty-seven villages on a small sheet of paper and placed it inside a basket. Furthermore, eight respondents drawn from the population survey were blindfolded and asked to pick randomly from the basket without replacement. This continued until the eight village was added to the sample survey; providing a target population of Okoroba, Ologoma, Olusasiri, Oromabiri, Otumakiri, Sabatoru, Sangakubu and Agada villages. It is noteworthy that this method fostered objectivity as the thirty-seven villages had an equal and independent chance of constituting the sample population. Secondly, at the point of contacting the individual respondents within the selected villages, the researcher(s) adopted the purposive or judgmental sampling technique. In doing this, the researcher deemed it necessary to sample respondents who reside and have spent about five years in the research locale. Also, culture bearers were given more attention due to their immeasurable wealth of knowledge and experience on the issues under investigation. The data used for this study were obtained from both primary and secondary sources. The primary data were gathered using questionnaire structured on the basis of the objectives, which were presented to respondents to express their views, opinions, and observations. Secondary data on the other hand refers to already published information. The secondary data used to conduct this study were sourced from textbooks, journals, articles, earlier publications, encyclopedia, and dictionaries. Essentially, the secondary data was used to develop a proper conceptual and theoretical framework for this study, while testing research hypotheses and providing answers to the research objectives was made possible by the primary data collated in course of fieldwork. To achieve the objectives of the study, the validity and reliability of the methods of data collection were given full attention. In an attempt to ensure that the instruments of data collections measure what they purport to measure; face validity type was adopted. The assistance of experts on measurement and evaluation were sought. In addition to this, a pre-test of the instruments was carried out before the actual field study in order to assess its validity, while Cronbach Alpha was set at 0.7 as recommended by Nunnaly (1978).

On the basis of analyzing relevant data collected from the field, the study adopted quantitative tool of data analysis. The analysis of the data for this study were based on the measurement scale used for the measurement of data collected, this is to say that data which are nominal in nature were analyzed using descriptive statistics such as; frequencies, percentages. Based on this, frequencies, percentages and tables were relevant in analyzing the socio-demographic characteristics of the respondents since these data are nominal in nature. On the other hand, the data that are ordinal in nature were analyzed using both descriptive and inferential statistics. For the descriptive statistics, mean and standard deviation were quintessential, while for the inferential statistics; Pearson correlation and Binary Logistic Regression were adopted through the aid of Statistical Package for Social Sciences (SPSS) which served as the inferential statistics used in testing the hypotheses in this study.

Results
It should be noted that (399) copies of questionnaire representing (100%) were distributed to respondents. However, (199) copies of questionnaire, measuring (49.9%) were found invalid

while (200) copies of questionnaire, reflecting (50.1%) were found valid. Hence, analysis was based on (50.1% = 200) copies of questionnaire that were retrieved and found valid for the study.

Table 1: Socio-Demographic Profile of Respondents

Variables	Frequency (N) =200	Percentage(%) = 100
Sex		
Male	90	45.0
Female	110	55.0
Age		
18-22	46	23.0
23-27	29	14.5
28-32	55	27.5
33-37	27	13.5
38-42	29	14.5
43 & Above	14	7.0
Educational Qualification		
No formal education	29	14.5
Primary	46	23.0
Secondary	38	19.0
Technical	32	16.0
Tertiary	34	17.0
Others	21	10.5
Dialect		
Ijaw	112	56.0
English	34	17.0
Pidgen	35	17.5
Others	19	9.5
Community		
Okoroba	24	12.0
Ologoma	37	18.5
Olusasiri	34	17.0
Oromabiri	24	12.0
Otumakiri	16	8.0
Sabatoru	9	4.5
Sangakubu	30	15.0
Agada	26	13.0
Occupation		
Unemployed	57	28.5
Farming/Fishing/Hunting	28	14.0
Trading	35	17.5
Civil servant	36	18.0
Others	44	22.0
Estimated income per-month		
>5,000	48	24.0
5,000-10,000	66	33.0
11,000-16,000	26	13.0
17,000-25,000	25	12.5
26,000 & Above	27	13.5

No regular pattern of income	8	4.0
Religious profile		
Christianity	102	51.0
Islam	27	13.5
African Traditional Religion	71	35.5

Source: Field Survey

Socio-Demographic Profile of Respondents

Based on the above, the first variable classified respondents on the basis of sex; analysis revealed that 90(45.0%) of respondents are male while 110(55.0%) of the entire population are female. Based on this, it is evident that majority of respondents in the study are female. Furthermore, the next variable classified respondents on the basis of age; analysis revealed that 46(23.0%) of respondents fall within the age bracket of 18-22 years, 29(14.5%) of respondents fall within the age limit of 23-27 years, 55(27.5%) of respondents fall within the age bracket of 28-32 years, 27(13.5%) of respondents are within the age limit of 33-37 years, 29(14.5%) of respondents fall within the age bracket of 38-42 years while only 14(7.0%) of the study population are within the age limit of 43 years and above. Therefore, it is acceptable to state that majority of respondents fall within the age bracket of 28-32 years accordingly.

The next variable classified respondents on the basis of educational qualification; data collated from field showed that 29(14.5%) of respondents had no formal education, 46(23.0%) of respondents attained primary qualification. Furthermore, 38(19.0%) of respondents attended secondary school, 32(16.0%) of respondents earned technical qualification, 34(17.0%) of respondents had tertiary qualification while 21(10.5%) of the study population had other qualification.

Again, the next variable grouped respondents on the basis of dialect; analysis revealed that 112(56.0%) of respondents spoke Ijaw, 34(17.0%) of respondents spoke English, 35(17.5%) of respondents spoke Pidgen while only 19(9.5%) of respondents spoke other dialect. Similarly, the next variable categorized respondents on the basis of community; analysis revealed that 24(12.0%) of respondents were located in Okoroba, 37(18.5%) of respondents inhabited in Ologoma, 34(17.0%) of respondents lived in Olusasiri, 24(12.0%) of respondents hailed from Oromabiri, 16(8.0%) of respondent resided in Otumakiri, 9(4.5%) of respondents lived in Sabatoru, 30(15.0%) of respondents hailed from Sangakubu while only 26(13.0%) of respondents were located in Agada. The next variable classified variable on the basis of occupation; analysis revealed that 57(28.5%) of respondents are unemployed, 28(14.0%) of respondents engaged in farming, fishing and hunting activities. Again, analysis showed that 35(17.5%) of respondents engaged in trade, 36(18.0%) of respondents are civil servant while only 44(22.0%) of respondents engaged in other occupation. The next variable classified respondents on the basis of estimated income per-month; analysis revealed that 48(24.0%) of respondents earned #5,000, 66(33.0%) of respondents earned #5,000-#10,000, 26(13.0%) of respondents earned #11,000-#16,000 in a month. Again, analysis showed that 25(12.5%) of respondents earned #17,000-#25,000 per month, 27(13.5%) of respondents earned #26,000 and above while 8(4.0%) of respondents had no regular pattern of income. Finally, the next variable categorized respondents on the basis of religion; analysis revealed that 102(51.0%) of respondents were Christians, 27(13.5%) of respondents are Muslims while only 71(35.5%) of respondents practiced African Traditional Religion. Hence, it evident that majority of respondents in the study are Christians, since they reflected the highest score of 102(51.0%).

Impact of Climate Change on Agriculture

The first objective of the study seeks to find out impact of climate change in the research locale. In this wise, the researcher tried to determine if there were threats of flood in the area of study; analysis revealed a mean score of 3.9 correlating a standard deviation of 1.9. This implies that there are threats of imminent flood in the area of study. Again, attempt was made to rate the level of rainfall in the research locale; analysis retuned a mean score of 3.5 with a standard deviation of 1.9. Accordingly, this infers that the level of rainfall in the area is high. In the same vein, the researcher deemed it necessary to find out if respondents experienced increase in average temperature in the area; analysis showed a mean score of 4.2 with a standard deviation of 2.0. This further connotes an affirmative response. Further probing to discover if low crop yield is caused by climate change; analysis revealed a mean score of 2.9 corroborating a standard deviation of 1.7. In this wise, it could be inferred that climate change affected the growth of plant in the area of study. And finally, the study tried to find out if water now run over farmlands in the area; data collated revealed a mean score of 3.6 with a standard deviation of 1.8 accordingly. Based on this, it is clear that water now run over farmlands in the research locale.

Table 2: Showing Impact of Climate Change on Agriculture

	Categories	Variables	F=200	$\overline{x}$	σ	RD
1	There are threats of flood in your area	Strongly agree Agree Undecided Disagree Strongly disagree	96(48.0) 47(23.5) 21(10.5) 25(12.5) 96(48.0)	3.9	1.9	Affirmative
2	Rate the level of rainfall in your area	Very high High Undecided Low Very low	40(20.0) 84(42.0) 28(14.0) 27(13.5) 21(10.5)	3.5	1.9	High
3	There is increase in average temperature in your area	Strongly agree Agree Undecided Disagree Strongly disagree	119(59.5) 34(17.0) 23(11.5) 17(8.5) 7(3.5)	4.2	2.0	Affirmative
4	Low crop yield is caused by climate change	Strongly agree Agree Undecided Disagree Strongly disagree	36(18.0) 36(18.0) 32(16.0) 63(31.5) 33(16.5)	2.9	1.7	Affirmative
5	Water now run over farmland in your area	Strongly agree Agree Undecided Disagree Strongly disagree	68(34.0) 42(21.0) 44(22.0) 26(13.0) 20(10.0)	3.6	1.8	Affirmative

Source: Field Survey

Climate Change and Land Degradation

The next objective in the study seeks to investigate land degradation; specifically, the researcher deemed it necessary to know if soil could be affected by climate change; analysis

revealed an overwhelming majority of153(76.5) affirmative response. Furthermore, the study tried to find out if there are fears that the soil might produce less food next farming season; analysis revealed a mean score of 4.1 with a standard deviation of 2.0. This implied that there were imminent fears among respondents of the soil producing less food next farming season. Furthermore, effort to rate palm oil from tress proved a mean score of 1.8 with a standard deviation of 1.3. This implied that palm oil was reportedly low in the research locale. On the contrary, the researcher decided to investigate cassava yield before the coming of multinational oil companies; analysis showed a mean score of 4.3 with a standard deviation of 2.1. This implied that cassava yield was reportedly high before the coming of multinationals in the research locale.

Table 3: Showing Climate Change and Land Degradation

	Categories	Variables	F=200	$\bar{x}$	σ	RD
1	Do you know that soil could be affected by climate change	Yes No Total	153(76.5) 47(23.5) N=200	1.77	1.3	Affirmative
2	There are fears that the soil may produce less food next farming season	Strongly agree Agree Undecided Disagree Strongly disagree Total	95(47.5) 71(35.5) 9(4.5) 16(8.0) 9(4.5) N=200	4.1	2.0	Affirmative
3	How can you rate the oil from palm trees in your area	Very high High Undecided Low Very low Total	10(5.0) 5(2.5) 14(7.0) 75(37.5) 96(48.0) N=200	1.8	1.3	Low
4	Rate cassava yield before the coming of multinational oil companies in your area	Strongly agree Agree Undecided Disagree Strongly disagree	119(59.5) 44(22.0) 21(10.5) 9(4.5) 7(3.5)	4.3	2.1	High

Source: Field Survey

Prevalence of Violent Conflict
The last objective investigated the prevalence of conflict in the research locale; analysis revealed an overwhelming majority of 129(64.5%) affirmative response. The researcher decided to investigate the nature of conflict in the area. Analysis showed a mean score of 2.3 with a standard deviation of 1.5. This implied that the nature of conflict was violent. Attempt to ascertain the causes of conflict, reported a mean score of 2.6 with a standard deviation of 1.6. This implied that climate change was the driver of conflict in the research locale.

Table: 4 Showing Prevalence of Violent Conflict

	Categories	Variables	F=200	$\bar{x}$	σ	RD
1	Do you experience conflict in your area	Yes No Total	129(64.5) 71(35.5) N=200	1.6	1.3	Affirmative
2	What is the nature of conflict in your area	Very violent Violent Sometimes violent	105(52.5) 58(29.0) 37(18.5)	2.3	1.5	Violent
3	What are the major causes of conflict	Food insecurity Oil pollution Climate change Land tussle	47(23.5) 39(19.5) 99(49.5) 15(7.5)	2.6	1.6	Food Insecurity

Source: Field Survey

Testing Hypotheses

H01: Socio-demographic characteristics do not play a role in violent conflict.

In the first hypothesis (table 5), the socio-demographic characteristics were analyzed using the Binary Logistics Regression to determine whether socio-demographic characteristics play a role in violent conflict. Analysis revealed sex with 0.999, Age with 0.998, Education with 0.997, Dialect with 0.999, Community with 0.994, Occupation with 1.000, Income with 0.998, Religion with0.995. Gleaning through the aforementioned data it is glaring that socio-demographic characteristic is not statistically significant thus plays no role in violent conflict. Hence the null hypothesis which states that socio-demographic characteristics do not correlate with violent conflict is accepted.

Table 5:Variables in the Equation		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1[a]	Sex	37.716	22963.241	.000	1	.999	23968520257853940.000	.000	
	Age	-24.096	8687.775	.000	1	.998	.000	.000	
	Education	-17.415	4603.469	.000	1	.997	.000	.000	
	Dialect	-12.828	12479.345	.000	1	.999	.000	.000	
	Community	-4.252	543.927	.000	1	.994	.014	.000	
	Occupation	1.975	5527.401	.000	1	1.000	7.207	.000	
	Income	-19.264	8052.235	.000	1	.998	.000	.000	
	Religion	63.929	10405.727	.000	1	.995	58092110397313480000000000000.000	.000	
	Constant	57.436	12507.766	.000	1	.996	8792581016398296000000000.000		

Source: Field Survey

H02: Climate change is not associated with environmental degradation

Table 6: Correlations

		Climate change	Environmental degradation
Climate change	Pearson Correlation	1	.771[**]
	Sig. (2-tailed)		.000
	N	200	200
Environmental degradation	Pearson Correlation	.771[**]	1
	Sig. (2-tailed)	.000	
	N	200	200
Source: Field Survey			

Again, table 6 above, in testing the relationship between Climate change (independent Variable) and Environmental degradation (dependent variable) the Pearson correlation coefficient revealed a value at 0.771 while the critical value is at p< 0.000). This shows that the relationship between both variables is statistically significant. However, since the point of significance is less than 0.05 we shall reject the null hypothesis which states that 'there is no co-relationship between environmental degradation and violent conflict' and accept the alternate hypothesis which states that 'there is a relationship between environmental degradation and violent conflict.

H03: Climate change does not correlate with violent conflict

Table 7 : Correlations

		Climate change	**Violent Conflict**
Climate change	Pearson Correlation	1	.841[**]
	Sig. (2-tailed)		.000
	N	200	200
Violent conflict	Pearson Correlation	.841[**]	1
	Sig. (2-tailed)	.000	
	N	200	200
Source: Field Survey			

Lastly, table 7 above, in testing the relationship between Climate change (independent Variable) and Violent conflict (dependent variable) the Pearson correlation coefficient revealed a value at 0.841 while the critical value is at p< 0.000). This shows that the relationship between both variables is statistically significant. However, since the point of significance is less than 0.05 we shall reject the null hypothesis which states that 'there is no co-relationship between climate change and violent conflict' and accept the alternate hypothesis which states that 'there is a relationship between climate change and violent conflict.

Findings
Remarkably, this study confirmed the findings by Etekpe (2007) and Ibaba (2012) which attributed violent conflict occasioned in Niger Delta to vagaries of climate change. Analysis revealed that Niger Delta was a flash point of violent conflict; in view of the rise in sea level, environmental pollution, and low crop yield, flooding and heavy down pour experienced in host communities. Oil exploratory activity was reportedly sabotaging the economy of rural areas. Occupations like farming, fishing was abysmally low. Respondents also reported that the violent conflict in the area was intensified by lack of economic livelihood. This followed the imminent rise in average temperature in the Niger Delta. Further probing, indicated that climate change was a major driver of food insecurity. As farmers reported a decline in cassava yield compared to decades ago. This structural imbalance has led to demographic stress; rural- urban migration in the research locale. Data collated from field survey indicated

that gas flaring accelerated climate change, due to the unabated operation of multinational oil companies; as they regretted that the environment was more productive before the inception of oil boom. However, on their part they still acknowledge that activities of pipe line vandals, illegal bunkering, and bush burning were risk factors to climate change.

Conclusion

Based on the analysis; the study concluded that socio-demographic characteristics of respondents played no role on violent conflict. Secondly, the study concluded that climate change correlated with environmental degradation in the research locale. Finally, the study concluded that climate change increased the risk of violent conflict in the study area.

Recommendations

Based on the above, the study recommends that, government should intensify effort to reduce the impact of climate change on agricultural gains. Adaptive mechanisms should be proffered for the rural population. Also, citizens should abhor nefarious acts that are inimical to the environment. Specifically, attitude related to illegal bunkering in the Niger Delta should be discouraged. Since climate change could be worsened by anthropogenic factors. In the same vein, non-governmental organizations should launch an aggressive campaign against illicit oil exploratory activities that makes gas flaring inevitable in the Niger Delta. This is to ameliorate further depletion of the ecosystem which makes fishing, hunting and farming occupations worthwhile in the research locale.

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