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Climate Change: Expansion of Sahara Desert into the Neighbourhood of Nigeria, Exodus of Insurgence and Serious Famine in Nigeria

J.O. OLOYEDE PhD[1], E.A ISAAC-ELESEMOYO[2], S. ADENIYI[3]
[1],*Department Of Geography University Of Ilesa, Ilesa, Osun State*
[2,]*Department Of Geography O.A.U, Ile-Ife*
[3],*Department Of Geography Osun State College Of Education Ila-Orang*

ABSTRACT: Climate change is proving to be inimical to man in all areas. It increases environmental temperature, brings inconsistence to precipitation and atmospheric turbulence. One of the consequences on the lithosphere is aridity, the aridity itself is one of the main factors of migration today. This climate has made several nationalities of Niger, Mali, Chad, Mauritania, Mauritius, Senegal etc migrated into Nigeria forcefully and are causing mayhem in the country. They constitute terrorists that brought genocide to the country. They hinder farmers to cultivate and from reaping their fruits there by bringing famine to the country. The objective of the research is to find out the root cause of famine in Nigeria and the best way to tackle it. The research work made use of primary data which is questionnaire from the sampled area of northern regions of Nigeria. Random sampling was used to distribute questionnaire to educated citizens of the northern Nigeria without minding the states of origin. Secondary data was also used to corroborate the facts searching for. The result revealed that mayhems of the terrorists caused famine in Nigeria. The research concluded with the suggestion that government should come out with full military operations to nip terrorisms on its bud.

KEYWORDS: Climate change, Desert/Aridity, Drought, Terrorisms, Mayhems etc.

I. INTRODUCTION

Climate change occurs from a change in equilibrium or steady state of climate. any slight disturbance in this steady state may result in significant change in one or more components making up the climate system to move to a new state of equilibrium that produces a new climate state, Ayoade (2003), NASA (2011), Oloyede (2018).This could result in a region change in average annual rainfall or change in average temperature for a given month or season. Bello (2010) stated indices of climate change to include changes in the following elements; temperature range, extreme seasonal temperatures, onset and cessation of the rains, rainfall seasonality and replicability of the main rainfall regime duration of the growing season and annual precipitation rate and shift in rainfall belts. Onwereme and Olorunfemi (2010) ascribed the effect of a change in climate solely to anthropological factor.

Climate change has its ichnogram across the globe however the imprints are not the same across the surface of the earth. Fields (2005) categorically stated that Africa continent is less responsible for anthropogenic climate change but more vulnerable to its effects than other continents, Adesina (2003). One of such radical significant effects is Sahara aridity expansion south ward. Oloyede (2019) pinpointed that the environmental

ecological impact of the climate change in northern West Africa region has gone haywire, by this statement he referred to the environmental aridity. The region has been severally altered with increased water stress called droughts. Array of scholars have itemized the peracute effects of droughts across the face of the earth for instance Masih et al (2014) pointed out that it leads to famine in many regions, malnutrition, health issues, loss of life, loss of animals, crop failures, and mass migration. The Emergency Events Database (Ed-DAT, 2014) gave out its report on drought impacts that during 1900 – 2013, there were 642 droughts events across the world which resulted into a great death toll of 12 million people and affecting over 2 billion. The total economic damages were estimated at USD 135 billion.

Table1: Number of droughts and their impacts globally during 1900 – 2013.

Continents	**Events**	**No. of People Killed**	**No. of People affected**
Africa	291	847143	362225799
America	134	77	69505391
Asia	154	9663389	177836029
Europe	42	1200002	15488769
Oceania	22	660	8034019
Total	642	11711271	2163090007

Source: EM – DAT (2014)

In the above table, and of the above Continents, Africa had more events of drought and higher number of the people affected than the rest of the Continents Sundry studies have addressed drought related issues in different regions of Africa notable of such are Clarke et al (2012); Comforth (2013), Dube and Jury (2000, 2002) these were focused on South Africa. We have Grannini et al (2008); Goverts and Lattan Z10 A (2008); Kasai et al (2010); Lebel et al (2009); Lodoun et al (2013) for Sahel (West Africa) that of Northwest Africa we have Touchan et al (2008) and (2011). The Lithadity of drought in Northern and some other areas of aridity of Africa cause serious migration into more fertile, moisture and arable areas of the continent in which is more focused, Oloyede (2019). These desert dwellers troupe into Nigeria from Northern Cameroun, Chad, Niger, Mali, Senegal, Mauritania, Mauritus, Sudan to mention a few nations. Unfortunately for the country, these intruders probably due to harsh arid environment where they left are highly villainous and nefarious across northern Nigeria and in other regions. They killed and maim with sophisticated weapons. They are probably aided by underworld gangsters. Different names are given to them in Nigeria; Land grabbers, terrorist, insurgence, Fulani herdsmen etc. they make their habitat in the forest and jungles from where they suddenly visit settlement to cause mayhems.

Table 2: Timeline on killings in the middle belt since January 1 to May, 2018.

- January 1 – 73 killed in Logo and Guma LGAs in Benue
- January 1 – 2 killed in Awe LGA, Nassarawa
- January 1 – 25 killed in Keana LGA, Nassarawa
- January 3 – 3 killed in Markurdi, menue State
- January 4 – 6 killed in Wukari in Taraba
- January 4 – 1 Killed in Gassol LGA, Taraba
- January 5 – 4 killed in Lau LGA, Taraba
- January 5 - 15 killed in Tse Akonbo, Tse and Tse Agule villages in Benue
- January 6 - 55 killed in Lau LGA in Taraba State
- January 8 – 3 killed in Sardauna LGA, Taraba
- January 8 - Two policemen killed in Logo, Benue State

- January 13 - 10 killed in Birnin Gwan LGA, Kaduna
- January I3 - 1 killed in Makurdi LGA, Benue
- January 14-1 killed in Bassa LGA, Plateau
- January 14-1 killed in Ibi LGA, Taraba
- January l6 - 5 killed in Madagali LGA, Adamawa
- January 16 - 5 killed in Guna, Logo and Okpokwu LGAs Benue
- January 18 - 11 killed in Madagaii LGA, Adamawa
- January 21 – l killed in Barkin Ladi LGA, Plateau
- January 21 - 6 killed in Juman LGA, Adamawa
- January 23 - 9 killed in Ardo Kola, Adanawa
- January 24 - 4 killed in Kaiama, Kwara
- January 25 - 15 killed in Bassa LGA, Plateau
- January 26 - 3 killed in Bassa LGA, Plateau
- January 26 - 2 killed in Ukum, Benue
- January 29 - 1 killed in Guma, Benue
- January 31 - 1 killed in Jema'a LGA, Kaduna
- January 3I - 9 killed in Birmin Gwari. Kaduna
- February l - 4 killed in Gassol, Tuaba
- February 2 -10 killed in Song, Adamawa
- February 5 - 2 killed in Guma, Benue
- February 6 - 8 killed in Obi, Nasarawa
- February 8 - 6 killed in Shellen, Adamawa
- February 10 - 2 killed in Benue
- February 10 - 3 killed in Bassa, Piateau
- February 11 - 4 killed in Jema'a, Kaduna
- February 12-2 killed in Guma, Benue
- February 26- 12 killed in Kajuru, Kaduna
- February 27 - 20 killed in Demsa, Adamawa

- March 1 - 15 killed in Saradauna, Taraba
- March 4 - 20 killed in Saradauna, Taraba
- March 5 - 25 killed in Okpokwu, Benue
- March 7 - 2 killed in Takum, Taraba
- March 8 - 11 killed in Bassa, Plateau
- March 9 - 9 killed in Bokos, Plateau
- March 12 - 26 killed in Bassa, Plateas
- March 13 - 7 killed in Guna, Benue
- March 13 - 1 killed in Lokoja, Kogi
- March 14 - 32 killed in Daima/Omja, Kogi
- March 14 - 6 killed in Bassa, Plateat
- March 15 - 5 killed in Takum, Taraba
- March 19 -10 killed in Omala, Kogi
- March 20 - 11 killed in Birmin Gwan, Kaduna
- March 22 -3 killed in Jos South, Plateau
- March 24 - 5 killed in Makurdi, Benue
- March 30 - 6 killed in Jema'a, Kaduna
- April 4 - 6 killed in Chikun, Kaduna
- April 4 - 4 killed in Takum, Taraba
- April 4 -10 killed in Gwer West, Benue
- April 5 – 5 killed in Dobga, Taraba
- April 5 – 30 killed in Gwer West, Benue
- April 5 – 50 killed in Offa, Kwara state
- April 7 – 4 killed in Bali, Taraba
- April 7 – 2 killed in Agatu, Benue
- April 8 - 5 killed in Birkin Ladi, Plateau State
- April 8 – 5 murdered in Obi Nasarawa
- April 8 - 4 killed in Keana, Nasarawa

- April 9- l killed in Guma, Benue
- April 10 - 10 murdered in Benue
- April 10 - 51 killed in Wukar, Taraba
- April 12 – 2 killed in Markudi, Benue
- April 12 – 2 murdered in Bimin Gwari, kaduna
- April 13 - killed in Bassa, Kogi
- April 14 – 4 killed in Logo, Benue
- April 14 - 78 murdered in Obi, Nassarawa
- April 17 – I killed in Logo. Benue
- April 18 – 4 killed in Bassa Plateau
- April 19 - l killed in Kutigi, Niger
- April 19 - 1 killed in Gwer West, Benue
- April 20-31 killed in Guma, Benue
- April 25- 19 killed in Gwer East, Benue
- April 25- 38 killed in Guma, Benue
- April 28- 14 killed in Birnin Gwari Kaduna
- April 29 -5 killed in Gwer West, Benue

Source: Saraki: 2018.

In the recent time, Guardian (2024) reported that 80 farmers were killed in one attack in Mafa ward, Yobe state. The attackers killed farmers and burnt houses in the village. Aljazeera (2020) stated that the United Nations gave the figure of brutal killing of the rice farmers in Zambamari village in one attack to be 110. Also, Aljazeera (2020) in the similar report, reported that 40 people were slaughtered in attack on labourers working in rice field in Borno State. Reuters (2023) in its own report on this issue stated that suspected Boko Haram killed 15 framers in northeast Nigeria. Njemanze (2024) gave example of 2015 to 2018, 37,500 farmers were killed, 32,000 were Muslims, 5,500 Christians, 60% were Hausa, 40% were Fulani. These killings are not religion or ethnic genocide but purely to eliminate farmers.

United Nation food and Agriculture Organization (2024) stated that Nigeria has the largest number of food insecured people in the entire world. The organization claimed its figure to be 31.8 million. In another report, UN (2024) warned that 82 million Nigerians might go hungry soon. World Food Programme (2024) in its own submission pinpointed that 26.5 million people across Nigeria are bound to face acute hunger between June – August 2024 lean season. United Kingdom Institute of Development Studies (2021) ranked Nigeria second poorest in food affordability globally. Many scholars alluded increase in hunger in Nigeria to be effect of COVID – 19, conflicts, poverty, high prices of food, poor method of agricultural practices etc. the most biggest of these is climate change via extension in drought/aridity and exodus of insurgence into geographical location called Nigeria.

Objective of the Study

The main objective of the study is to find out the root cause of famine in Nigeria and the best way to tackle it

Hypotheses

Ho1:- There is no Significant relationship between Climate change and exodus of insurgence into northern central Nigeria.

Ho2:- There is no correlation between insurgence and famine in north central Nigeria.

II. Methodology

This search adopted survey type where in it used primary data through the use of questionnaire from the sampled area of northern regions of Nigeria. random sampling was used to distribute questionnaire to educated citizens of the said regions and someone who had lived in the regions without minding states of origin. What is important is the regions or zones. Secondary data was used on tables 1 and 2 that is for the statistics to corroborate previous scholars' ideas. Paper based surveys questionnaire was used, closed-ended stems structured in Likert scale with clarity and simplicity language.

Analyses
Special Package for Social Scientist (SPSS) was used for the analyses of this work. Pearson, chi-square, Bivariate, and Regression analyses tools were used.

Table 3: Demographic information of Respondents

Gender	**Frequency**	**Percentage**
Male	78	39.0
Female	122	61.0
Total	200	100.0
Part of the Country		
North Central	54	27.0
North East	73	36.5
North West	73	36.5
Total	200	100.0
Age Category		
Youth	107	53.5
Adult	76	38.0
Aged	17	8.5
Total	200	100.0
Educational Status		
Secondary School Certificate	15	7.5
Tertiary	185	92.5
Total	200	100.0
Occupation		
Farming	12	6.0
Artisan	8	4.0
Business	32	16.0
Civil Service	53	26.5
Student	95	47.5
Total	200	100.0

Source: Authors field work (2024)

The table above shows the distribution of the respondents that participated in the research inform of supplying of information. In the area of gender balance, researchers used more female (61%) than male (39%). Northern parts of the country in the study area with north central having 27% of respondents, north east and west had 36.5% each. On age distribution of the participants, youth with 53.5% Adult (38%) and aged (8.5). this simply shows that youths are most affected than adult, the aged are the least affected of the insulgence. Educational staturwise, school certificate holders is 7.5% and thosein the higher learning are 92.5%. About occupation Farmers 6%, Aritsans 4%, Businessmen 16%, Government workers 26.5%

Table 4: Climate Change, Desert Expansion, Insurgence and Famine

S/N	ITEMS	SA	A	D	SD	Weighted mean	Decision
1.	Climate change is real.	124	68	8		3.58	Agreed
2.	This climate change has caused increase in the area covered by Sahara desert in North Africa.	96	93	3	8	3.39	Agreed
3.	Sahara desert has almost overwhelmed the North Africa.	72	105	23		3.25	Agreed
4.	Climate change and its narrative in the deserts has caused serious decline in economic activities in the desert prone countries of North Africa.	98	87	10	5	3.39	Agreed
5	There has been mass movement of people out of desert prone countries of North Africa.	92	72	28	8	3.24	Agreed
6.	Such people from neighbouring countries of Nigeria are those causing mayhem in many parts of Nigeria.	112	48	20	20	3.26	Agreed
7.	Killings by the insurgence continues unabated in several places in North Central Nigeria.	88	88	8	16	3.24	Agreed
8.	These killings prevent people from farming and staying in the rural areas of this country.	96	72	24	8	3.28	Agreed
9.	This insecurity of lives and properties singularly caused famine in Nigeria.	96	60	24	20	3.16	Agreed
10.	Many farming areas and villages have been taken over by insurgents.	100	76	16	8	3.34	Agreed
11.	Famine will continue unless insecurity stops.	96	60	28	16	3.18	Agreed
12	Government should beef-up security.	96	80	24		3.36	Agreed
13	Government should endeavour to ask for help internationally to tackle insecurity.	116	60	20	4	3.44	Agreed

Source: Field Survey 2024.

The above table revealed response of respondents on the issues of Climate change, desert expansion, insurgency and famine. Considering the benchmark of 2.5, Majority agreed with the statements that Climate change is real (3.58), that climate change has caused increase in the area covered by Sahara Desert in North Africa (3.39), that Sahara Desert has almost overwhelmed the North Africa (3.25), that Climate change and its narrative in the deserts has caused serious decline in economic activities in the desert prone countries of North Africa (3.39). Majority also agreed that There has been mass movement of people out of desert prone countries of North Africa (3.24), that such people from neighbouring countries of Nigeria are those causing mayhem in

many parts of Nigeria (3.26), that killings by the insurgence continues unabated in several places in North Central Nigeria (3.24), that such killings prevent people from farming and staying in the rural areas of this country (3.28), that insecurity of lives and properties singularly caused famine in Nigeria (3.16), that many farming areas and villages have been taken over by insurgent (3.34), that famine will continue unless insecurity stops (3.18). Majority also agreed that Government should beef-up security (3/36), and that Government should endeavour to ask for help internationally to tackle insecurity (3.44). The implies that climate change has caused serious issue that led to increase in coverage of Sahara Desert in the North Africa, which also resulted in exodus of insurgents from the neighbouring countries. This has also resulted in insecurity of lives and properties, and may farming areas and villages have been taken over by insurgents which made farmers abandoning their farms, thereby causing famine in the country.

Table 5: Chi-Square Test of relationship between Climate Change and Exodus of Insurgence in Nigeria.

	Value	**df**	**Asymp. Sig. (2-sided)**	**Contingency Coefficient**
Pearson Chi-Square	2.201E2[a]	24	.000	.724
Likelihood Ratio	124.751	24	.000	
Linear-by-Linear Association	54.125	1	.000	
N of Valid Cases	200			

a. 26 cells (66.7%) have expected count less than 5. The minimum expected count is .16.

The above table revealed the chi-square analysis of relationship between climate change and exodus of insurgence in Nigeria. This shows that there is significant positive relationship (X^2 =2.201, p = 0.000) between climate change and exodus of insurgence. The contingency coefficient of 0.724 indicates a strong relation between climate change and insurgency. This implies that climate change is a factor responsible for insurgency which has led to destruction of lives and properties in the Northern parts of Nigeria.

Table 6: Chi-Square Test of relationship between Insurgence and Famine in Nigeria

	Value	**df**	**Asymp. Sig. (2-sided)**	**Contingency Coefficient**
Pearson Chi-Square	7.738E2[a]	108	.000	.891
Likelihood Ratio	491.447	108	.000	
Linear-by-Linear Association	159.980	1	.000	
N of Valid Cases	200			

a. 124 cells (95.4%) have expected count less than 5. The minimum expected count is .06.

The above table revealed the chi-square analysis of relationship between Insurgence and Famine in Nigeria. This shows that there is significant relationship (X^2 =7.738, p = 0.000) between Insurgence and Famine. The contingency coefficient of 0.891 indicates a strong relation between Insurgence and Famine. This implies that Insurgency in North is a factor responsible for Famine we are experiencing in the nation at the moment. This corroborate the findings of Ake, (2019) who stated that insurgency has remained an issue of concerns as it has gradually pushed the nation to the zone of food insecurity, because farms and rural areas where agricultural activities are carried out to supply the food need of the nation are taken over by the insurgents, farmers had abandoned their farms just to secure their lives, and food production is drastically becoming impossible.

Table 7: Bivariate Analysis of Relationship between Insurgence and Famine in Nigeria

	Mean	Std.	N	Pearson	P-value

		Deviation		Correlation	
Insurgence	19.4600	4.06584	200	.897**	.000
Famine	12.9700	2.56358	200		

Correlation is significant at the 0.01 level (2-tailed).

The above table revealed the analysis of relationship between Insurgence and Famine in Nigeria. This shows that there is significant positive relationship (r=0.897, p = 0.000) between Insurgence and Famine.. This implies that Insurgency in North is a factor responsible for Famine we are experiencing in the nation at the moment. This corroborate the findings of Ake, (2019) who stated that insurgency has remained an issue of concerns as it has gradually pushed the nation to the zone food insecurity, because farms and rural areas where agricultural activities are carried out to supply the food need of the nation are taken over by the insurgents, farmers had abandoned their farms just to secure their lives, and food production is drastically becoming impossible.

Table 8: Regression Analysis of Factors Associated with Famine.

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	-1.478	.452		-3.268	.001
	Desert expansion	.468	.041	.375	11.319	.000
	Insurgence	.401	.021	.636	19.220	.000
	Climate change	.124	.131	.028	.944	.346
	R	.942[a]				
	R Square	.888				
	F	516.823				

a. Dependent Variable: famine

The above table revealed determinants of famine in Nigeria. The model demonstrates a very good overall fit, as indicated by the coefficient of determination (R-squared) of 0.888. This suggests that the exogenous variables account for 88.8% of the variation in the outcome variables. It shows that all factors together have a significant influence on the famine. The coefficient for Desert expansion is positive and significant at a 1% level of significance. This implies a direct relationship between desert expansion and famine. A unit increase in desert expansion results in a 0.375 unit increase in famine, assuming all other variables remain constant. The coefficient for Insurgency is positive and significant at a 1% level of significance. This implies a direct relationship between insurgency and famine. A unit increase in insurgency results in a 0.636 unit increase in famine, assuming all other variables remain constant. The coefficient for climate change though positive but not significant at a p=0.346. This implies that there is no significant relationship between climate change and famine, this is as a result that climate change on its own can be mitigated.

Conclusion

On the final note, the research analyses of the two hypotheses have plainly shown that there is significant relationship between climate change and exodus of insurgents into northern Nigeria who are causing maryhems in the country. This has dove -tailed into famine, since large percentage of the farmers have been eliminated. Few farmers left are afraid of going to farm for the fear of being killed.

Recommendations

Addressing insecurity in Nigeria requires a multi-faceted approach. Here are some recommendations:

Short-term measures:
Strengthen security agencies: Provide training, equipment, and resources to security personnel. Intelligence gathering: Enhance intelligence collection and sharing among agencies. Community policing: Establish community policing initiatives to build trust and gather local intelligence. Emergency response: Establish effective emergency response systems.Border control: Secure Nigeria's borders to prevent influx of arms and criminals.

Long-term measures:
Address poverty and unemployment: Implement economic empowerment programs toreduce poverty and unemployment. Education and skills development: Invest in education and skills development programs. Infrastructure development: Improve infrastructure, including roads, electricity, and healthcare. Justice and accountability: Strengthen the justice system to ensure accountability and punishment for crimes. National unity: Foster national unity and cohesion through inclusive policies and dialogue.

Strategic recommendations:
National Security Strategy: Develop a comprehensive national security strategy.Security sector reform: Reform security agencies to ensure effectiveness and accountability. Civil-military relations: Improve civil-military relations to ensure cooperation. Regional cooperation: Collaborate with neighboring countries to address regional security challenges. International partnerships: Foster international partnerships to access training, equipment, and expertise.

Economic recommendations:
Economic diversification: Diversify Nigeria's economy to reduce dependence on oil. Investment in agriculture: Invest in agriculture to reduce food insecurity and create jobs. Infrastructure development: Invest in critical infrastructure to support economic growth. Entrepreneurship support: Support entrepreneurship and small businesses. Social welfare programs: Implement social welfare programs to address poverty and inequality.

Social recommendations:
Community engagement: Engage with local communities to build trust and understand security concerns. Youth empowerment: Empower youth through education, skills development, and job opportunities. Social cohesion: Promote social cohesion through inclusive policies and initiatives. Conflict resolution: Establish effective conflict resolution mechanisms. Human rights: Protect human rights and ensure accountability for human rights abusers.

Government recommendations:
Leadership accountability: Ensure leadership accountability and transparency. Policy implementation: Implement policies effectively and consistently. Interagency coordination: Enhance interagency coordination and cooperation. Citizen participation: Encourage citizen participation in security decision-making. Resource allocation: Allocate resources effectively to address security challenges.

International cooperation:
Collaborate with international partners to access training, equipment, and expertise. Participate in regional security initiatives. Engage with international organizations (e.g., UN, AU, ECOWAS).Share intelligence and best practices. Access international funding and resources. Implementing these recommendations requires a concerted effort from government, civil society, and international partners

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