MedCrave
Step into the World of Research

MOJ Ecology & Environmental Sciences

Research Article

Open Access

CrossMark

Climate change: a factor to farmers/herders crisis in Benue State, North Central, Nigeria

Abstract

The study "Climate Change: A Factor to Farmers and Herders Crisis in Benue State, North Central" focused on the crisis of farmers and herders in relation to the climate reality of the region. The study used 34 years rainfall date (1981-2014) for analyses. The study observed that rainfall in the entire State displayed a mono peak characteristic. The high rainfall months are May, June, July, August and September, with September having the highest rainfall. The rainy season is duration when farmers plant and tend their crops, it coincide with the natural period of foliage growth and the period of herders movement to the region as a result of extreme rainfall in the Southern part of Nigeria and insufficient rainfall in the Northern part. This implies that the crisis between farmers and herders are most likely to occur between the months of May to October, while crops are still in the farm. The annual rainfall trend and dispersion shows that rainfall distribution over the years is increasing, improved rainfall implies that natural vegetation and water will be available for animals, thereby encouraging the in flock of herders and there animals, a situation which will increase the rate of confrontations. The rather increasing rate of crisis in the face of improved rainfall points to either excessive herders' presence or that other factor, other than climate change is responsible for the crisis. The analysis of the decadal rainfall also shows that the rainfall situation is improving of recent. Negative dispersion is an indication of low crisis, while a positive dispersion from point of climate change is an indication of heighten crisis between farmers and herders. The study also observed that improved medical knowledge has also led to the crisis. Period to improvement in the field of medical science climate influence movement of herders due to the presence of tsetse flies, but as a result of vaccination herders are staying more permanent in the region than before. Finally, ranked correlation shows the relationship between climate shift and crises between farmers and herders.

Keywords: climate shift, crisis, farmers, herders, movement, rainfall distribution and season

Volume 7 Issue 5 - 2022

Chinago Budnukaeku Alexander
Department of Transport Planning and Logistics, School of Environmental Sciences, Captain Elechi Amadi Polytechnic, Nigeria

Correspondence: Chinago Budnukaeku Alexander, Department of Transport Planning and Logistics, School of Environmental Sciences, Captain Elechi Amadi Polytechnic, Rumuola. Port Harcourt, Nigeria, Email chinago.alexande@portharcourtpoly.edu.ng

Received: October 18, 2022 | **Published:** November 02, 2022

Introduction

Climate is the aggregate weather conditions of a place over a long period of time. It is a long-term pattern of weather of an area. Basically, climate is defined as an average weather condition of a place over a long period of time, like 30 – 35 years. This assumption of climate is not cast on stone, since there is no specific or fixed year to start the counting or to end it. Therefore climate by nature is not static, there has been a slow change in climate from year to year without the public notice, but as the year goes by the climatic time differences maybe come clearer or manifest.[1–3]

Climate is a natural resource that affects every human endeavour. The elements of climate such as, Precipitation, Temperature, Wind, Sunshine duration, Cloud cover, Relative humidity and Pressure influences human lives and activities in one way or another, especially in an emerging economies and in the tropical regions in particular.[4,5]

Climate shift is a clear variation of climatic condition of an area from the previous conditions. It is dispersion from the normal average condition expected. It can be compared with a movement away from the normal. This shift is called by many as climate change. But by nature climate is expected to change, since it is an end of a product (Weather).[6–8]

The end product "climate" is based on the daily, weekly and monthly weather conditions of a place; therefore what is actually varying is the pattern of the weather.

Weather is the atmospheric condition of a place over a short period of time, not exceeding three months. However, the variation has a general pattern, whose average over a long period of time give raise to climate. But a change in the general pattern of variation of weather will definitely affect the end product (climate). To address the issue of climate change therefore, adequate understanding of weather and issues related to weather must be in the front burner of discussion.

Man does not only depend on climate as a resource, but most of human dependent resources also depend on climate for survival. For instance vegetation and animals (flora and fauna) are all climate dependent. While fauna moves from place to place in reaction to climate impact, the flora does not. This will have triple consequences for flora and those depending on it.

The first consequence is that the impact of adverse climate is more on flora than fauna. Take for instance in event of drought, herders will attempt to move their herds to another area, to a natural water source or closer to a well. None of these will be very easy to a farmer who depends on the vegetation for survival.

The second consequence is that the activities of mobile fauna will affect the static flora. When cattle moved to an area, there tend to be competition among the herders for foliage for their herds. Note what has caused the high population of the flock is adverse climate, which is also affecting the flora within the region.

The third consequence is struggle or crisis between herders and farmers as a result of protecting their means of livelihood.

A climatic shift may cause a dwindled or lack of natural vegetation (foliage) for animal. It can in drastic occasion also affect availability of water for man, animal and plants. This implies that man, animal and

plant will struggle for scarce water. The situation in most cases led to dryness of crops and death of animal and even hunger and migration.

According to,[9] Agriculture in the tropics depends very much on the vagaries of nature, so if the rainfall and temperature of a place change negatively, it signifies disaster to the people and their environment.

The central parts of Nigeria, as a result of their nice geographical location which can enable them to have double cultivation of some crops are dubbed the "food basket of the nation" because of its moderate rainfall. However, that situation has changed lately due to constant attack or crisis with the Fulani herdsmen, who climate shift has forced out of their original homes in the north. In search of greener pasture and water, due to the type of pasturage practice in Nigeria known as pastoral nomadism (Movement of herdsmen and their flock from place to place in search of pasture and water). The herdsmen move down south ward in search of greener pasture and water, in an attempt to keep their flock alive in face of climate shift and its consequences, they invaded farms, which is the only place where pastures are found. The farmers in the other hand will try all they can to protect their source of livelihood, the farm. The right to protect what belong to each of these groups will lead to bloodshed and crises. This struggle is actually triggered by climate shift.

This work is not interested in the rate of killings and destructions. Many scholars and journalist has done that already,[10–14] This work attempt to establish the relationship between climate shift and farmers/herders crisis in Benue State without been judgemental or indicting any group. This is because the only way to solve a problem is if the cause of the problem is identified.

Effect of Climate Shift on Flora and Fauna

[15,16]Stated that the ecosystem in a common place for both flora and fauna, under specific climatic condition that enabled them to survive and carried out their activities as living organism. However, a climate shift will alter the existing condition for both plants and animals, and by extension the ecosystem.

Climate shift can lead to the destruction of habitat. An increase in temperature will affect cold blooded animals and plants that cannot with stand high temperature. Melting of ice caps will engender polar bears etc. Similarly, excessive rainfall can lead to flood, thereby destroying the natural habitat of many species, including plants. Extended drought is not also better than flood, as it will reduce water available for both plants and animals. The soil will loss water, humans are not spared in extreme climate shift condition. Survival especially for plants is very difficult. It can also lead to forced migration.

Increase in rainfall in Benue State will lead to fall in temperature and dampness, which is favourable condition for tsetse fly (Glossina species) which causes trypanosomiasis (Sleeping sickness). This disease is dangerous to cattle. Therefore, high rainfall may force the herders to move northward with their cattle. But as the condition get drier, the herders move further southward.[17] That explains the recent confrontations between the herders and the indigenous people of southeast and southwest and of recent with the south-south people of Delta State.

Higher temperature will cause the melting of polar cap ice, this will give raise to increase in sea level, and this will affect both plants and animals. While man and animals will try to move to favourable places, the plants which are source of food to man and animal will be badly destroyed.

The soil will be affected as a result of climate shift. Excessive water will lead to water log and deficiency of soil air will suffocate plants and underground organisms. Lack of water in the soil, will mean translocation will not take place. This implies that minerals cannot be transferred easily and growth will be stunt. The community of plant will die off in the face of adverse climatic shift. Chemical property of the plants and animals may as well be affected by adverse climate shift.

Climate shift and human struggle

The livelihood of farmers depends on their crops; similarly, the hope of herders is their cattle or animals. This is especially so, as the government lacks welfare packages for her citizenry, not to talk about the down trodden peasant farmers and herders. The survival of their economic activities means life for them and their families.

The rainfall situation in northern Nigeria has changed or shifted significantly as studies have shown.[17–19] The climate shift has forced the herders from north, even beyond Nigeria to move southward in search of greener pasture and water for their animals.

To a reasonable extent the climate shift has also affected the growth of grasses which is the normal food of the animals. The length and robustness of the grasses has dropped, because of scanty rainfall. Besides, the population of the people has increased, therefore exerting pressure on land. The entrance of herders with their flock into the region is added pressure on land that is fixe. The pressure is manifested on lack of natural grasses for the animals. During the dry season the few grasses are dry and can hardly sustain the cattle. This will lead to struggle among the herders, but as the situation get worse and worst they form a common front and forcefully enter into farms, thereby using crops of farmers to feed their cattle to the detriment of the farmers.

The farmers cannot watch and see their life investment been destroyed by foreigner. They will attempt to stop the herders from entering into their farmland. This effort is mostly resisted by the herders, who see themselves as the rightful owner of the entire bush. In most case farmers were killed and their houses burn.

The farmers knowing that their livelihoods are at verge of destruction all also fight back with everything within their power. This situation is the common within the central region of Nigeria, and in Benue State in particular.

The resultant effect of the climate shift is the crisis between the farmers and the herders, the burning of villages, killing of farmers by herders and killing of herders' by farmers, destruction of farms and rustling of cattle. Sometimes both the farmers and the herders are victims of suspected armed men whose identity remained a mirage.[20]

The unrest and crisis between farmers and herders has been long, but seems to be seasonal. All that has changed as the climate shift manifest clearer. Seasonal moving back seems not to be option now, rather what seem to be option is even moving southward for greener pasture. What this mean is penetration of insecurity to the southern Nigeria in attempt to save their flock.

According to United State Agency for International Development[21] the struggle for survival between the farmers and the herders claimed about 7000 persons from 2015 to 2019. This exclude billions of Naira cost to the economy.

The rainfall condition and the location of the central region of Nigeria, makes it vulnerable to attack from herdsmen. Benue State falls within the migratory route of the herders. Secondly the rainfall condition is moderate and bearable to herders. The mean annual rainfall of Benue State is about 1141mm. The year with the lowest

rainfall is 2003, with annual mean rainfall of 65.65mm. While it is common in many years that December, January, February many not record rainfall at all. The monthly mean rainfall for the 34 years of study is about 95mm.The rainfall condition of Benue State shows a positive trend, which is an indication of more crises. Understanding rainfall characteristics and pattern over the study area will go a long way to check and control the unrest in the area, especially during the critical months of crises.

Area of study

The selected study areas include Benue State and Kano State.

Benue State is selected because of its key position in food production in Nigeria and its geographical location. Similarly, Kano State is selected as a centre of commerce of the northern States and indeed Nigeria.

Benue State is located between longitude 7° 47' E and 10° 00'E and latitude 6° 25' and 8° 08' N. It occupies 34,059 km^2 of land. It has boundaries with about five states; it is bounded in the north by Nasarawa State, in the northeast by Taraba State. The southern boundaries include Enugu southwest, Ebonyi and Cross Rivers State in the south. The western border is Kogi State. It has an international boundary with Cameroun in Southeast. Benue State was created in 1976. The capital is Makurdi. The State derived its name from river Benue. The name is coined from Bantoid word "Beer Nor" mean Hippopotamus water. It has a population of 4,253,641 during 2006 census.

Benue indigenous people include the Tiv, Idoma, Igede and Etulo.[22]

Benue State generally is regarded as guinea savannah vegetation region with a mono peak rainfall by July. The State can cultivate two set of cereal due to migration pattern of rainfall within the region. Benue State falls into Tropical Wet climate. The general rainfall is 2000-2500mm annually; the rainy season is roughly about 6 to 7 months. The southern part of the state has double maxima of rainfall. But with the changing climate the state is experiencing a mono peak rainfall in July. The mean temperature is 27°C according to[23] the relative humidity is about 70%; with a temperature range of about 6°C (Figure 1).[24–26]

Figure 1 Map showing Benue State.

Source: *Google Earth*

Methodology

The basic element of climate use for this work is rainfall data. The rainfall data of Benue State was extracted from Nigerian Meteorological Agency, Oshodi Lagos. The study period is from 1981–2014 (34years). Data were analysed using descriptive and inferential statistics such as graphs, Mean, Standard deviation, dispersion level Spearman rank correlation.

Rainfall activity will be grouped in decadal intervals of 10years of continuous trends as shown (1981-1990, 1985-1994, 1989-1998, 1993-2002, 1997-2006, 2001-2010, and 2005 -2014) to see the rainfall adequacy of the study area. Distribution of rainfall will be compared to crisis between herders and farmers, and the casualty involved.

Questions were asked to locals who have witnessed or have first-hand information on the farmer herders' crisis in the study area. The responds of the 15 persons interviewed are collapse as the field report on yearly crisis rate. The age, academic qualifications, martial statue and occupation of those interviewed are not deemed very necessary. Interpreters are used in some cases.

Formula for Spearman rank correlation

$$r^1 = 1 - 6\sum d^2 / n\left(n^2 - 1\right) \quad (1)$$

Where n is the sample size.

$$Coefficient\ of\ variation\ \left(CV\right) = \sigma / \delta * 100 \quad (2)$$

Result and discussions

34 years rainfall of the study area was analyse with the intension of investigating the relationship between farmers and herders level of crises. Questions were asked and papers were read to ascertain the impact of change in climate to farmers/herders relationship.

The rainfall peak is positively skewed to the right. September, August and July are the wettest months in Benue State.

Table 1 shows the rainfall statistics over the study area during the period of study. From Table 1, it was observed that September recorded the highest rainfall (7614.60mm); it also has the highest average deviation and the lowest coefficient of variation of rainfall. This implies that September rainfall is reliable. By implication the grasses are naturally available for herders and their flock during the months of September and August as shown in Table 1.

The least rainfall occurred in the months of December and February with 36.9mm and 107mm of rainfall in the 34 years of study. The months of December and February has an Average rainfall deviation of 1.85 and 5.31 and coefficient of variation of 285.89 and 385.87 respectively. The result points to low rainfall within the months of December to early March in the study area. The implication is that struggle for foliage among herders in one hand and the struggle with farmers in the other, can hardly occur during the months of December to March, when the rainfall is least expected in the study area. The survival of the flock is more at risk during the very low rainfall months, hence the migration of herders and their flock toward the more wet southern part of the country. From Table 1, it was observed that CV is inversely proportional to average deviation. Therefore they are indicators of rainfall reliability in different ways.

Figure 2 is a clearer illustration of Table 1, which is the rainfall characteristic in the study area.

Rainfalls for 4 months are lower 10mm in the study area. Rainfalls from November to March are below 20mm, which implies that rainy season has not started then in the study area or that rainfall has end.

From Figure 2, from late October to early May the struggle between the farmers and herders can erupt due to insufficient water or scanty rainfall.

Citation: Alexander CB. Climate change: a factor to farmers/herders crisis in Benue State, North Central, Nigeria. *MOJ Eco Environ Sci.* 2022;7(5):154–160. DOI: 10.15406/mojes.2022.07.00261

Table 1 Summary of rainfall statistics over Benue State from 1981-2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total	197.4	107	515.3	2384	4561.2	5452.7	6222.3	7397.8	7614.6	4070.9	224	36.9
Mean	5.81	3.15	15.16	70.12	134.15	160.37	183.01	217.58	223.96	119.73	6.59	1.09
AVEDEV	9.13	5.31	16.47	40.29	47.17	52.89	64.8	63.06	68.31	62.76	9.96	1.85
STDEV	15.06	12.14	22.86	52.98	63.11	70.39	79.49	82.8	80.66	83.75	14.5	3.1
CV	259.39	385.87	150.84	75.56	47.04	43.89	43.44	38.05	36.01	69.95	220.08	285.89

Source: *Nigeria Meteorological Agency*

Note: AVEDEV is the average deviation of the monthly rainfall from the mean rainfall of the stations. STDEV is the standard deviation of rainfall; it does the same the AVEDEV, but is values are higher, while the CV is coefficient of variation of the rainfall. It is a function of the mean rainfall and the standard deviation of rainfall. It is rainfall reliability check. It was observed that the higher the CV., the less reliable the rainfall, and the lower the CV., the more reliable the rainfall.

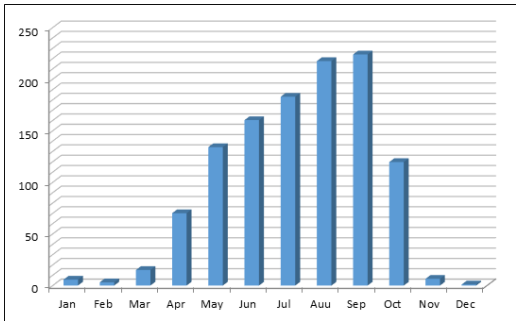

Figure 2 Mean monthly rainfall characteristics over Benue State.

Source: *Field report*

The struggle and crisis between farmers and herders will likely occur or most expected from late April to early October when rainfall hit over 100mm and crops still in farm. Farmers at this point are busy planting, weeding and tending their crops.

Benue State generally has a skewed peak rainfall with the highest rainfall occurring in the month of September. The months of December and February had no rainfall. Rainy season starts or begin in April when the rainfall is above 51mm. The entire rainy season lasts for about seven months. The dry season lasts for five (5) months as shown in Figure 2. The dry months are chronically dry, as some months do not record single rainfall.

Figure 2 shows that crisis can hardly occur during the months of November to March, since the rainfall cannot sustain animal rearing as the grasses are dry in those months.

Figure 3 shows that the trend over the study period is positive (increasing over the year). That is an indication that rainfall distribution is increasing. As the rainfall is increasing, so the temperature is also increasing. The increase in temperature is an indication of high evaporation, which affects availability of water in the study area.

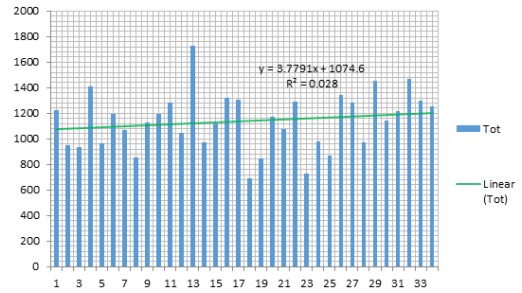

Figure 3 Trends of rainfall from 1981-2014.

Source: *Field Report*

Increase in rainfall means that more herders will flock the study area since the rainfall condition is promising. The more herders migrate to the study area, the more pressure they will exert on natural grasses and man-made vegetation crops. The situation will lead to confrontation between the farmers and herders.

A very heavy rainfall condition will lead the herders to move down southward, such situation will relieve the study area. An improved rainfall up north will also cause the herders to move northward. The determinant of the herders and the flock movement is absolutely a factor of the climate and weather.

Figure 3 shows improved rainfall condition in the study area. Areas north of Benue State had insufficient rainfall, the rainfall increases, is not sufficient to satisfy the herders flock, hence the trance-humane journey southward.

The farmers also have the challenge of land use and climatic shift. Improve rainfall is followed closely by dry season, which is when most of the natural vegetation dries up. The herders' only means of assuring that their flock survive is to forcefully enter the farmers land. The farmers in quest to survive will fight back, this give raise to the incessant farmers and herders crisis in the study area.

Though, of recent the farmer, herder struggle has taking a new dimension (Political).

Nevertheless, improved rainfall condition will go a long way to minimize the crisis.

Figure 4 shows the rainfall dispersion along the mean rainfall of the station. The left hand are rainfall years below the station mean, while the right hand is an indication of rainy years above the station mean rainfall.

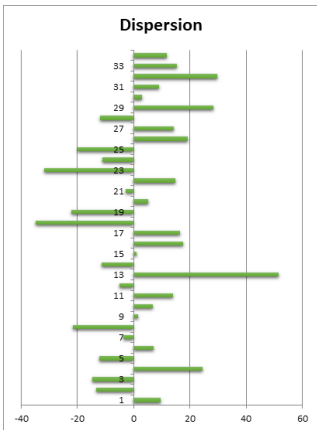

Figure 4 Rainfall dispersion from the mean.

Source: *Field work report*

Citation: Alexander CB. Climate change: a factor to farmers/herders crisis in Benue State, North Central, Nigeria. *MOJ Eco Environ Sci.* 2022;7(5):154–160. DOI: 10.15406/mojes.2022.07.00261

Figure 4 shows that the first 10years of study (1981-1990), only 4 years recorded rainfall greater than the station mean rainfall, while 6years had rainfall lower than the station mean rainfall. A similar look at the last 10years of study (2002-2014) shows that 8years of study had rainfall greater or above the mean rainfall of the study area, while just 2 years recorded rainfall less than or lower than the station mean rainfall. This is an indication that the increase on farmer and herders war is as a result of climatic shift.

Years with rainfall lower than the station mean rainfall will translate to crisis between farmers and herders before the peak month of September, but this will not last since the condition is too bad to bear by flock. The herders fight small and move further south to provide for the cattle. The years with rainfall above the station mean, in the other indicate a crisis year. The rainfall keep the herdsmen throughout the rainy season, as dry season set in they move to the farmlands. Most recently, they tend to take over the villages of the farmers in areas with good water supply or well. In some cases the farmers fight back to reclaim their land and farm. Some other times, because farmland have been destroyed or to repay the herdsmen, cattle were rustled and herders killed.

Relationship between climate shift and Farmers/ Herders crisis in Benue State

The relationship between climatic shift and farmers/herders crisis in Benue State of Nigeria is best explained using Figure 5. Figure 5 is an illustration of continuous decadal rainfall. It explain shift in rainfall distribution over the years using interval of 10 years.

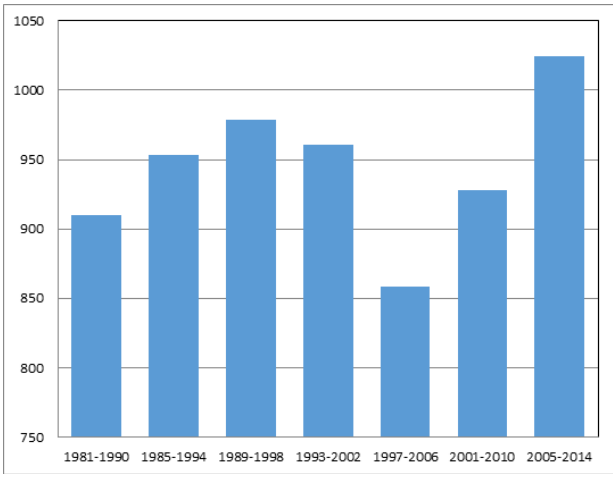

Figure 5 Decadal rainfall distribution.

Source: *Field work report*

Figure 5 1997–2006 show that low rainfall triggers farmers and herders' crisis, the rainfall condition improved slightly, between 2001-2010 decadal periods, and not much to improve the situation, the rainfall improved during 2005-2014 decadal period.

It has been observed that the crisis hardly occurred during the very dry months when the farmers were off the farm. That time the herders had moved further south. From the months of April when rainfall had started in the study area to October is the critical crisis period.

It is important to note that the year with lowest rainfall does not translate to a more critical crisis year. From tables 6, years with little or scanty rainfall will be less crisis year, since the herders will be forced southward, leading to crisis between herders and south west/ south east farmers.

Excessive rainfall and semi flood situation forces the herders to dry area or further north. If rainfall situation in Benue State keep improving, what the security men could not do well be handled by climate shift (Table 2).

Table 2 Relationship between rainfall occurrence and rate of crisis and death toll

Year	Rainfall occurrence	Rate of crisis	Death toll
1981-1990	910.1	5	16
1985-1994	953	12	30
1989-1998	978.6	15	55
1993-2002	960.9	14	41
1997-2006	858.5	10	25
2001-2010	927.7	18	53
2005-2014	1024.8	22	73

Source: Field work report, 2017

Using Spearman rank correlation for analysis on the farmers/ herders crisis and the related death toll, the study tested the crisis level and the death toll differently.

For the crisis rainfall distribution analysis it was observed that $r^1 = 0.75$, which is a positive correlation. The coefficient of determination (r^2*100) = 56.25%. That implies that climate shift accounts for over 56% of the crisis between farmers and herders. The study shows that years with scanty rainfall had relative fewer crises. This is because, when there is no pasture and farmers have not planted, intrusion may not be observed.

Analysing the death toll rainfall distribution relationship, it was observed that $\sum d^2 = 8$ and $r^1 = 0.8572$, this shows a strong relationship between climate shift and number of death.

The coefficient of determination $r^2 = 73.47\%$. This implies that climate change is responsible for over 73% of death that as a result of farmers' herders' crisis.

It is noted that more death occurred recently as a result of weapon used by those involved. The more sophisticated weapon used the more death toll numbered.

Major causes of crisis between farmers and herders

Population increase: Due to increasing population the quest of increasing food for teeming population spur the farmers to clear more land, some of this land are pastured corridor created for herders long ago. In the other hand the population of herders and their cattle has also increase to meet up the meat demand of the people. This led the herders to pass their boundary and even enter people's farm.

Interference of elites to farmers' herders' affair

The price of firearm is so expensive that ordinarily peasant herders could not afford it. However, well-coordinated elite groups such as the Myittallah responsible for arming of the herders, and hiring of militants as herders or herders guides. These militant herders are responsible of sacking villages and the wanton destruction recently attached to herders.

Lumbering and indiscriminate felling of trees

The way farmable land is disappearing in Nigeria is alarming. It is on record that about 410,000 hectares of forest are lost yearly in Nigeria. This has a double effect on the country and those that relate to land use. First, as farmable land is lost to urbanisation, pressure on land increases. The farmers and the herders have relative small

Citation: Alexander CB. Climate change: a factor to farmers/herders crisis in Benue State, North Central, Nigeria. *MOJ Eco Environ Sci.* 2022;7(5):154–160. DOI: 10.15406/mojes.2022.07.00261

land area at their disposal. Secondly, deforestation affects the micro climate of an area. It can increase the rate of evaporation and reduce the rainfall of an area. These will affect the availability of water in a region, which in turn affect the activity of farmers and herders and their output.

Suggestion and Remediation

Herders should be encouraged to grow their own pastures and desist from moving from place to place. That system of pasturage is out dated as it engender their lives and that of their flock, therefore this work suggest that foliage field should be planted and water from transferring water from rivers within and outside the region. Since animal rearing is an important occupation in Nigeria, the federal government should subsides in such foliage farm

Trees and shelter belt should be planted. In Nigeria there lot of trees that can survive hash condition, coupled with many rivers both in the south-south and south-west part of the country. A new micro environment can be created by making water available for trees and crops, such effort will modify the weather condition of the area, in the other hand the climate.

Climate shift should not be treated as an insignificant matter. Therefore activities that trigger climate change should be reduced. Secondly, new crops that can easily be adapted with climate change should be introduced for cultivation.

Government should provide adequate security for both farmers and the herdsmen, as their activities are vital for the country survival and self-sufficiency.

Farmers and Herders should collaborate for effective production of food in Nigeria. The droplets of the animals can serve as manure for the crops, while the crops can provide pasture for the animals.

Arming of herders should be prohibited and defaulters be sanction, similarly, the harassment and molestation of innocent herders should be sanctioned and defaulter punishable by law of the land.

Nigeria is a secular federal country; therefore the government should do everything legally within its power to unify the people of various groups or state. Of recent the crisis between farmers and herders cannot be placed on climate shift or change or pressure on land, since these has no relationship on burning of villages, hamlet and farmstead. Therefore, Agriculture should be practice out of sentiment and tribal domineers

Nigeria should close her border to cross border grazing as some of her neighbours have done. This is because majority of the herders killing are not done by Nigeria herders, as attested by some political leaders from northern Nigeria.

Conclusion

Farming and rearing are important human activity in Nigeria, they are vital for self-sufficiency, however, this important sector of the economy largely, depends on the dictate of weather and climate. The recent change in climate in West Africa has cause a lot of stress to farmers and herders which has led to confrontations between farmers and herders.

The study observed that the rainfall condition of the study area is improving, is an indication that herders and farmers crisis will continue. The shift in climate may change the situation, if (1) the place is too wet, (2) the place is too dry and (3) legislation prohibiting open grazing in the region is enacted.

The sophisticated weapon presently involved in the farmers/herders crisis is beyond what peasant herders could afford, therefore it is clear that elites are indirectly involve in the struggle.

Government should provide security to the citizenry for robust economic growth of the nation.

A critical analysis of information shows that both farmers and herders are victim to gunmen without identity, which is suspected from some quarters as bandit trans- border herders. The sack villages, loot homes and rustle cows all in the name of conflict between farmers and herders. They move their loot to their countries to the chagrin of Nigeria.

It is clear that other factors are also involved in the crisis of farmers and herders. This could be seen in the destruction of villages. Cattle are also rustled from herders.

The national borders should be closed to foreign herders or trans-borders grazing. Evidence shows that both the farmers and the herders are victims to these gunmen herders.

Acknowledgments

None.

Funding

None.

Conflicts of interest

The authors declared that there is no conflict of interest.

References

1. Alexander CB. Climate change–a case study of Port Harcourt city rainfall pattern. *Journal of Social Science and Development.* 2012;1(3):54–60.
2. Ajayi POS. *Comprehensive geography for senior secondary school,* A. Johnson Publishers Lagos; 2003.
3. Bradshaw M, Weaver R. *Foundation of physical geography.* Wm. C. Brown Publishers; 1995.
4. Mayhew C. *Dictionary of Geography*. London: University of Oxford Press.
5. Alexander CB. Comparative analysis of thunderstorm and rainfall occurrences over Nigeria. *IOSR Journal of Environmental Science, Toxicology and Food Technology.* 2015;9(3):38–44.
6. National Oceanic and Atmospheric Administration. Observing climate variability and changes. 2007.
7. Alexander CB. Climatological review of enugu rainfall from 1916–2012 and its implications. *Global Journal of Science Frontier Research (H).* 2015;15(1):1–10.
8. Chinago AB. Analysis of rainfall trend, fluctuation and pattern over Port Harcourt, Niger Delta coastal environment of Nigeria. *Biodiversity International Journal.* 2020;4(1):1–8.
9. Ayoade JO. *Introduction to climatology for the tropics*. Ibadan Nigeria: Spectrum Publishers; 2004.
10. Imo CK. The demographic implications of nomadic herdsmen and farmers clashes in Nigeria. *International Journal of Development and Management Review.* 2017;12(1):45–58.
11. Punch. *Herdsmen destroy farms in Osun villages.* 2018.
12. This Day. *Suspected Herdsmen Kill 14 in Benue, Nasarawa Communities.* 2018.

13. Ibanga I. Problems and prospect of rural development in Nigeria. 2016.
14. Galadima DJ. Basics of conflict reporting in rate. In: Pate U, editor. *Introduction to conflict reporting in Nigeria.* Frankad Publishers; 2002.
15. Cabrelli A, Beaumont L, Hughes L. Austral ark: the state of wildlife in Australia and New Zealand. Cambridge University Press; 2015:65–82.
16. Abaje IB, Ishaya SI, Usman SU. Analysis of rainfall trends in Kafanchan, Kaduna State, Nigeria. *Research Journal of Environment and Earth Science.* 2010;2(2):89–96.
17. Mbaawuaga EM, Iroegbu CU, Ike AC. Hepatitis B Virus (HBV) serological patterns in Benue State, Nigeria. Open Journal of Medical Microbiology. 2014;4:1–10.
18. Odjugo PAO. Regional evidence of climate change in Nigeria. *Journal of Geography and Regional Planning.* 2010;3:142–150.
19. Adejuwon JO. An Assessment of the changing pattern in the choice of vegetable varieties in Sokoto–Rima River Basin, Nigeria. *International Journal of Ecology and Environmental Studies.* 2015;3(2):7–15.
20. Amnesty International Report. *Harvest of death.* Three years of bloody clashes between farmers and herders in Nigeria. 2018.
21. United State Agency for International Development. 2019.
22. National Population Commission. *Nigeria demographic and health survey*. 2019.
23. Iwena OA. *Essential geography for senior secondary school.* 8th edn. Nigeria: TONAD Publishers; 2018.
24. Federal Government Population Gazette. Federal Republic of Nigeria; 2009.
25. Hilhorst T, Liere MJ, Ode AV, et al. Impact of AIDS on rural livelihoods in Benue State, Nigeria. *Journal of Social Aspects of HIV/AIDS.* 2006;3:382–393.
26. Google. Google earth map extract. 2022.

Citation: Alexander CB. Climate change: a factor to farmers/herders crisis in Benue State, North Central, Nigeria. *MOJ Eco Environ Sci.* 2022;7(5):154–160. DOI: 10.15406/mojes.2022.07.00261