

ASSESSING THE EFFECTS OF CLIMATE CHANGE ON AGRO PASTORALISTS COMMUNITIES IN ARGUNGU LOCAL GOVERNMENT AREA, KEBBI STATE, NIGERIA

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ABSTRACT

One of the biggest enemies of humanity in the 21st century is Climate Change. This is because, Climate Change has affected almost all parts of human endeavor especially agriculture, transportation, health, and housing among others. The issue of this Change attracts the attention of earth scientists, especially the Geographers. However, the effect of climate change has manifested almost everywhere in the world. In Nigeria, one of these effects is flooding which devastated several farmlands including housing across all the geo-political zones of the country. Other effects include dryness of water courses and prolonged dry season. In a related development, flora and fauna were also affected by Climate Change as Climate Change causes sickness and death of animals. Given this development, the paper examined the perception of agro-pastoralists on the issue of Climate Change. Agro pastoralists contribute greatly to the gross domestic product of the nation. The study uses a structural interview method to collect information from the agro-pastoralists in Argungu local government of Kebbi State. Moreover, a total of 236 samples were selected systematically out of a total population of 2360 agro-pastoralist households as contained in the livestock immunization register from the veterinary office obtained from the Department of Agriculture, Argungu Local Government Secretariat. Therefore, after counting Ten (10) households from each district, one agro-pastoralist household was selected as a sample. The studies find out that, the agro-pastoralists are aware of climate change via mass media and local observation. Conclusively, the paper suggested that agro-pastoralists should be given more attention by the federal government due to their role in national development.

Keywords- Agro pastoralists, climate change, communities, geo political zone, Earth's scientist.

1. INTRODUCTION

Climate Change is one of the global pandemics of the 21st century, drawing the attention of people worldwide, especially political leaders, scientists, and academics. The effects of climate change have impacted every aspect of life and are observed to be more severe in the current century. Christensen et al. (2007) emphasized that global warming is rapidly becoming an issue, and Africa will likely experience up to a 20% decrease in precipitation by the end of the 21st century. According to the United Nations Panel of Climate Experts, Africa is highly vulnerable to the impacts of climate change due to widespread poverty, recurring Droughts, inequitable land distribution, and dependence on Rain-fed Agriculture, etc. (IPCC, 2001). North-eastern and north-western Nigeria is the most vulnerable region to the effects of climate change. The increasing heat and limited rainfall have accelerated desert encroachment, loss of wetlands, and decline in surface water, plants, and animal resources available (Abdulkadir et al., 2017; Akande et al., 2017; Ebele & Emodi, 2016; Federal Ministry of Environment, 2014). Vulnerability analysis demonstrates that states in the north face higher vulnerability to climate change than those in the south (Madu, 2016; Federal Ministry of Environment, 2014). Higher temperatures, reduced rainfall, droughts, and desertification diminish farmland for lower agricultural productivity, and impact crop production. With the current climate changes, livestock productivity, survival, and distribution will be affected by the diminished quantity and quality of grazing land and the prevalence of vector-borne diseases among livestock (IPCC, 2001). Droughts have also become more frequent in Nigeria and are expected to persist in northern Nigeria due to declining precipitation and rising temperatures (Olapido, 2010; Amanchukwu et al, 2015).

Pastoralists are people whose major source of livelihood is livestock herding, and they mostly live in dry and remote areas. The type of livestock that pastoralists keep varies according to climate, environment, water, and other natural resources in the geographical area. In Nigeria, they are commonly found in arid and semi-arid areas. These areas are characterized by marked rainfall variability and associated uncertainties in the spatial and temporal distribution of water resources and grazing lands. The pastoral resources needed by pastoralists are directly and indirectly affected by climate change. Nigeria's agriculture is predominantly rain-fed and, therefore, vulnerable to climate change (NFNC, 2003).

Pastoral activity represents a significant component of Nigeria's economy. Pastoralists are the major breeders of cattle and other livestock that provide meat and dairy products consumed by Nigerians and provide jobs to millions of citizens in the country. Livestock production accounts for one-third of the agricultural GDP and 3.2% of the nation's GDP (CBN, 2006). According to the National Bureau of Statistics, Abuja, 2014, the livestock sector accounted for about 26% of agricultural GDP and about 10% of the nation's GDP in 1990 but declined, with agriculture contributing only 19.50% in the first quarter of 2014. The relevance of livestock and agriculture began to depreciate with the discovery of crude oil in the country.

Pastoralists in Nigeria are confronted with various problems affecting the development of the livestock industry. These include irrigation and agricultural development programs, which have made pumps and open-dug wells available for increased agricultural production in floodplain (Fadama) areas. The rivers and wetlands that used to serve as good grazing land for the pastoralists are now blocked off by farms and gardens (Heinrich Boll Foundation, 2000). Other factors include rapid population growth and environmental degradation caused by climate change and variability, especially in the developing countries of Tropical Africa. Argungu local government Area is among the places suitable for pastoral production due to its good drainage network system, terrain, and available land for crop production and pastoral activities. These factors, among others, have led to the concentration of pastoralists and pastoral activities in the local government over time. Therefore, this research work intend to find out the perception of climate change among the pastoralist in the study area. however, the study attempt to examine the effect of the climate change as it affect the livelihood of Agro-pastoralist to adjust the climatic variability as it affect both plants and animals under their care

➤ Statement of the Research Problem

Studies have been conducted in the past and present on the issues of climate change in Nigeria and West Africa sub region. Study such as FOA, 2006, Gaase 2000, Vasco et al 2020, Vensun and Rud2021, Midu 2020, Lenshie et al 2020 to mention but just a few. The said scholars concentrated their research on farmer's herder's conflicts in Nigeria, but did not relate climate change with the livelihood of the pastoralists who are in abundance across the northwestern Nigeria. Therefore, this research attempt to bridge the gap in knowledge by relating the climate changes with Agro pastoralists who play an important role to the economic development of the sub region. Therefore, this research is new and genuine.

2. OBJECTIVE OF THE STUDY

This research has the following objectives:

- ✓ To assess the perception of the agro pastoralists communities in Argungu local government area regarding climate change
- ✓ To identify the effects of climate change on livelihoods of agro pastoralists z
- ✓ communities in Argungu local government
- ✓ To highlight the mitigating measures taken by agro pastoralists on the issue of climate change.

3. SCOPE OF THE STUDY

This research work was restricted to the effect of the Climate Change on agro pastoralist living in Argungu Local Government Area of-kebbi state, Nigeria. In addition, the work was restricted to only six political wards in Argungu local government namely: Gulmah, Lailaba, Sauwa, Gwazange, Tungar Zazzagawa, and Alwasa ward. The reason behind the selection of these areas is that, during preliminary survey to the local government, these are the areas or political wards where agro pastoralists are found. Therefore, only agro pastoralists' households who have been in the area from 2000-2024 will be selected for interview.

4. RATIONAL OF THE STUDY

Climate change becomes a great enemy of humanity in the 21st century. This is because climate change has manifested and continues to manifest in the world. Although, the causes are said to be natural and manmade. Some of the effects that disturbed the humanity include extreme weather, drought, and dryness of wetlands and above all, the extinction of plants and animals species. There for, if climate change can cause such calamity, the effect is not only on human. The agro pastoralist who depend on water, pasture to feed their animals are also affected, the spread of infectious diseases are among the effect of Climate Change to animals. Therefore, this is what motivated the researcher to carefully look at the perceptions of ago pastoralists on the issues of climate change. However, this study will be useful to Federal, State and Local Governments towards helping the agro pastoralists to cushion the effect of climate change on their livestock. The Federal ministry of agriculture could benefit from this work by obtaining information necessary that will help them to provide extension workers toward educating the pastoralist on the mitigation measures to be taken to cushion the negative effect of climate change.

5. METHODOLOGY OF DATA COLLECTION

This research study involved preliminary survey to the study area. Therefore, a survey to the study area will be conducted round the local government area in order to identify the wards where these agro pastoralists are found. However, having identified the district and villages (Rugga) with the aid of their local leaders in order to understand the geographical boundaries of these wards. Secondly, another visit will be paid at Argungu livestock market which operates on every Friday of the week to interact with agro pastoralists who do come to market every market days to buy or sells animal and other commodities. The last trip is to arrange with data collectors for administration of interviewing with the selected sample of the population.

STUDY AREA

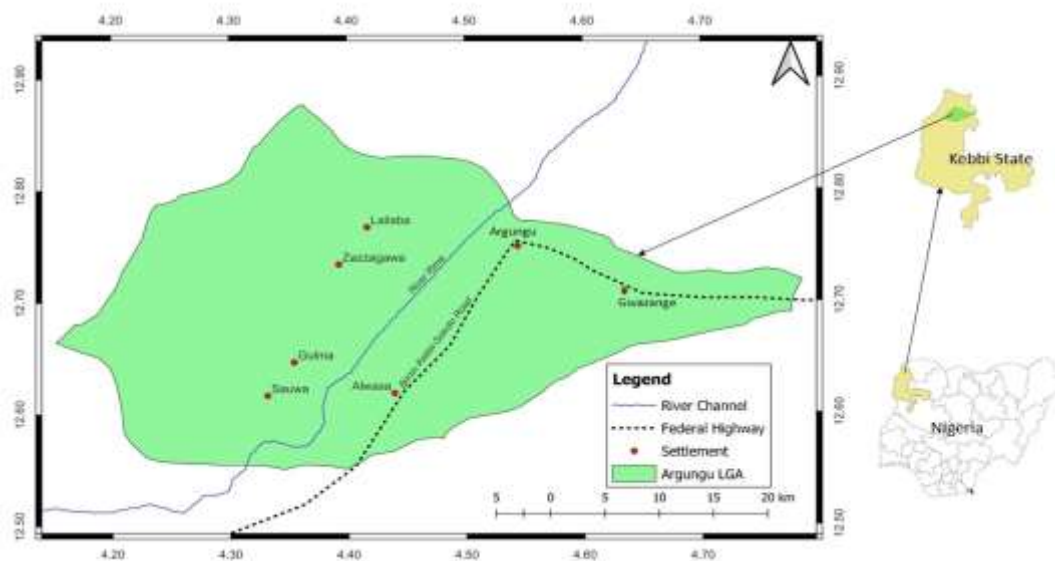


Figure 1.1

Map of the Study Area

Argungu Local Government is located between $12^{\circ} 30' 13.311''$ N to $12^{\circ} 40' 15.411''$ N and longitude $40^{\circ} 20' 15.411''$ E to $40^{\circ} 30' 15.411''$ East, covering an area of about 1226.81. It shares borders with the Yabo local government area of Sokoto state to the northeast, in the south by Gwandu and Birnin Kebbi local government areas, and to the north and west by Augie and Arewa local government areas, respectively. Argungu is located along the valley of the river Rima, with an average height of between 200 to 400 meters above sea level, and is interrupted by isolated flat-topped lateritic-capped clay hills and ridges. It comprises young sedimentary rock of Gwandu formation, Ilo and Rima groups. The major soils of the area are the upland and Fadama soils. While the upland soil is sandy and well-drained, the Fadama soil is generally clay and hydromorphic.

The vegetation of the area is Sudan, characterized by open woodland and scattered trees such as acacia albida (Gawo), Parkia Clappertoniana (Dorawa), Borassus and Dum palms, Adansonia reticulata (Kuka), Vitex cienkowskii etc. Human activities have altered the natural vegetation in many places, giving rise to farmed parkland dominated by trees like pilostigama, Ziziphus, Mangifera indica and Tamarindus.

The area enjoys a tropical continental climate largely controlled by two air masses, namely tropical maritime and tropical continental air masses, blowing from the Atlantic Ocean and Sahara desert, respectively. The wet season lasts from May to September, and the dry season lasts for the remaining periods of the year. It has an annual rainfall of about [773-800mm] (NIMET, 2023). Temperature is generally high, with a mean annual temperature of about 21°C in winter to 40°C between April and June. The area is drained by the river Rima, which sources its water from the tributaries of rivers Bunsuru, Gagare, and Maradi. The river's velocity is closely related to the seasonal rainfall pattern being largely concentrated in the short wet season, with the highest runoff in late August or early September when widespread flooding is common. During the dry season, these rivers lower the flow.

The area is dominated by three major tribes (Hausas, Fulbe, and Zabarmawas). According to the (2006) population and housing census, Argungu had a population of about 200,248 (NPC, 2006). This number increased to 233,820 in 2011 and was estimated to be 260,677 in 2015. Agriculture is the mainstay of the people living in the area, and most farmers use local tools and farms for their consumption. With the creation of new agricultural policies aimed at improving rice production, more people are now involved in irrigation, which has expanded the irrigation land in the

area. There are more agricultural activities in the western part of the local government area, where the flood plain is available. Farmers cultivate cereal crops in upland areas like millet and sorghum mixed with beans. In the Fadama areas (along the floodplains), farmers grow crops such as rice, fruits, cocoyam, potatoes, and vegetables.

6. METHOD OF DATA COLLECTION

To collect data for this research, the researcher uses structured interviewing method, and the reason behind is that, during the preliminary survey to the districts revealed that majority of the agro pastoralists cannot read and write effectively in English language, hence, the need for interviewing method become necessary. The researcher and the data collectors in accompany with their local leaders (Ardo) will bear the responsibility of translating and interpreting the questions to the respondents in their language (Fulbe) or Hausa depending on demand where necessary.

Target population

In order to reach the target sample, the researcher will work with the local guides, usually the local leaders of these social groups and with the help of systematic sampling and purposive method that the target population can be reach.

Sampling Frame, Size and Method

This research was designed to collect information from agro pastoralist's communities living within Six (6) political wards in Argungu local government area. Therefore, routine livestock immunization register is obtained from the department of agriculture at Argungu local government secretariat which contained a total of 2360 agro pastoralist households during the year 2023 immunization and will serve as sampling frame for this study from which sample for this study will be selected.

Sampling Size Selection

As earlier contained in the 2023 routine vaccination exercise register, a total of 2360 agro pastoralist households was reordered. The researcher adopted systematic sampling combined with purposive method to arrive at the sample size. Therefore, after every count of 10th households in each agro pastoralist settlement one household will be selected as sample in all the Six (6) political wards in Argungu local government area.

Table: 1.1population of Agro pastoralist according to ward's in Argungu Local Government Area

S/ No	Political ward	Household registered	Relative %	Sample selected
1	Gulmah	420	18	42
2	Lailaba	450	19	45
3	Sauwa	550	23	55
4	Alwasa	350	15	35
5	Tungar zazzagawa	500	21	50
6	Gwazange	90	4	9

Sources: Argungu Local Government Veterinary Unit (2024)

Method of Data Analysis

In order to provide useful information and reliable result, the research will adopt the use of SPSS. All information collected from the field will be subjected to simple descriptive statistic using table, frequency and percentage method as well as graph such as Bar chart, histogram and frequency to illustrate the information collected from the field.

Analysis and Discussion of the Result

Table 3.1 Socio demographic profile of Agro pastoralist

Responses	Frequency	Percentage
Gender		
Male	229	97%
Female	7	3%
Total	236	100
Marital status		
Married	228	96%
Divorce	4	2

Single	4	2
Total	236	100
Major occupation of the respondents		
Civil servant	00	00
Crops and livestock production	230	97%
Trading	06	03%
Total	236	100
Age of respondents		
15-30 yrs	20	8%
31-50 yrs	116	49%
51-80	70	30%
Above 80 yrs	30	13%
Family size		
1-5	86	34%
6-10	60	25%
Above 10 children	96	41%
Total	236	100

Source: Fieldwork 2025.

The table above described the socio-demographic profile of agro pastoralist in the study area. Information collected on the gender of the respondents revealed that 97% (229) are male and 3% (7) are females. This revelation may not be a surprise in the sense that, in traditional African societies males are breed winners and head of household.

Table 3.2: Family Size of the Agro pastoralists from the Study Area

Responses	Frequency	Percentage
Family size		
1-5	80	34%
6-10	96	41%
Above 10 children	60	25
Total	236	100

Secondly, information in the marital status of the pastoralist was collected and analysed. It is hereby exported that, 96% (228) are married and 3% (4) are divorces while 2% (4) are single. However, this revelation is in line with the culture and tradition of Fulanis (Fulbe) and in line with their belief where a male child at the age of 18 years has attained maturity stage and is ready for marriage, the something's females usually by culture a girl at the age of 13-18 is already at her husband compound.

Thirdly information was sourced on the major occupation of agro pastoralist in the study area. It is hereby reported that, 97% (230) engaged in livestock and crops production and 3% (6) engaged in trading and 0% (0) are civil servants. In addition to this, question was asked on the estimated average age of the respondents and information collected revealed that, 49% That, 49% (116) aged between 31-50 years old, and 30% (70) aged between 51-80 years old, and another 8% (20) his their aged between 15-30 years old, lastly 13% (30) has their ages above 80 years old. However, their finding supports the culture and traditional of agro pastoralist where farming and animals rearing are carried out by energetic people usually between the ages of 31-50 years.

Moreover, analysis of the number of children of the respondent was sourced and data in table 3.2 revealed that, 34% (80) has children between 1-5 at home, 41% (96) has 6-10 children at home while 25% (60) has 10 and above children. This revelation may be attributed to the culture and religion of the Fulbe and (Africans) where high number children are something of pride by the families.

Table 3.3 Climate Change awareness among agro pastoralist in Argungu Local Government Area

Responses	Frequency	Percentage
Climate Change Awareness		
Yes	210	89%
No	15	6%
Neutral	11	5%
Total	236	100%
Sources of information about Climate Change Awareness		
Contact with elite	17	7%
Via local observation	69	29%
Via mass media (Radio)	150	64%
Total	236	100
Noticing the changes in climatic elements (temperature and rainfall) over decades		
Yes	220	93%
No	16	7%
Total	236	100%
Rainfall Comparison over last Two Decades		
Increases	226	96%
Decreases	10	4%
Total	236	100
Knowledge on the root causes of Climate Change		
No	211	89%
Yes	25	11%
Total	236	100

Source: Fieldwork 2025.

Furthermore, table 3.3 described awareness of climate change among agro pastoralist in Argungu local government area. Information on whether the pastoralists are aware of climate change was collected and analysis revealed that 89% (210) of agro pastoralist area are aware about the phenomenon of in the area, and 6% (15) are not aware about this change, while 5% (11) stand neutral to the question.

In addition to this, when question was asked if yes where do they obtained the information, and analysis revealed that, 64% (150) got information via mass media and 29% (69) obtained the information through local observation while 7% (17) obtained the information through contact with urban residents. Therefore, this finding is supported by Garba (2023), who opined that cattle herders are aware of climate change via mass media such as Radio, and Radio is the most common device at the hand of cattle herders in kebbi state, North western Nigeria.

In addition to this, question was also asked on if pastoralists have noticed any change in temperature and rainfall in the last 20 years, and information collected revealed that, 93% (220) have observed changes in temperature and rainfall and 7% (16) responded that, there is no change in such climatic elements. In related development question was asked to source the information on comparison of rainfall and temperature of the area with that of 20 years back. Information collected revealed that, 96% (226) of agro pastoralist described there is increase in temperature and rainfall when compared with last 20 years, and 4% (10) stated that, there is a decrease in both temperature and rainfall when compared with that last 20 years. Moreover, question was asked whether the agro pastoralists are aware of the root cause of climate change. It is reported that, 89% (211) are not aware of the causal factors of climate change and 11% (25) among them are aware of the root cause of climate change.

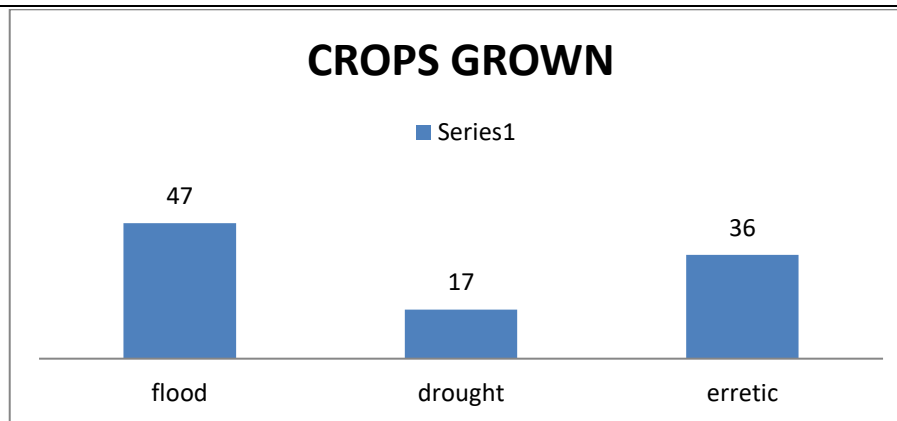


Figure 3.1

Source: Fieldwork 2025

The above figure indicate that, among the 236 respondent interviewed , 41% (96) engaged in crops farming such as cereal crops like Millet and sorghum 15% (36) engaged in production of leguminous crops such as beans, groundnut and none of them engaged in vegetable farming, and another 44% (104) engaged in production of all crops mentioned earlier. This revelation indicates that agro pastoralist in the study does not only involved in livestock production but also engaged in crops production, the reason may be attributed to strategy of a saving the stalks of crops and dry pasture of legumes against the changing nature of climate in order to feed their animals during the dry season period of the year.

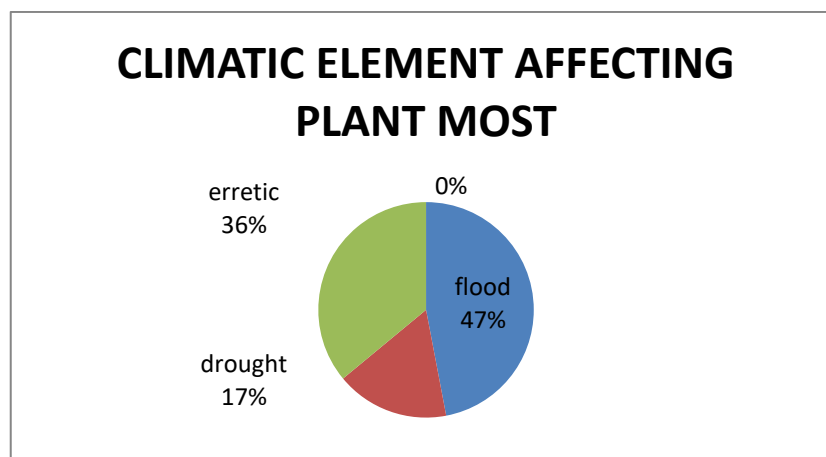


Figure 3.2

Source: Fieldwork

Moreover, question was set to determine the climatic element that affect agro pastoralist crop most, and data revealed that 30% (72) blamed extreme weather condition and 11% (26) put the blame on humidity while 14% (32) blamed the wind storm in the area and lastly 45% (106) blamed the rainfall pattern in the area as the worst element that affect their crops. This finding may be connected to geographical location of the study area within the savanna region of West Africa where rainfall variability is more common in the region.

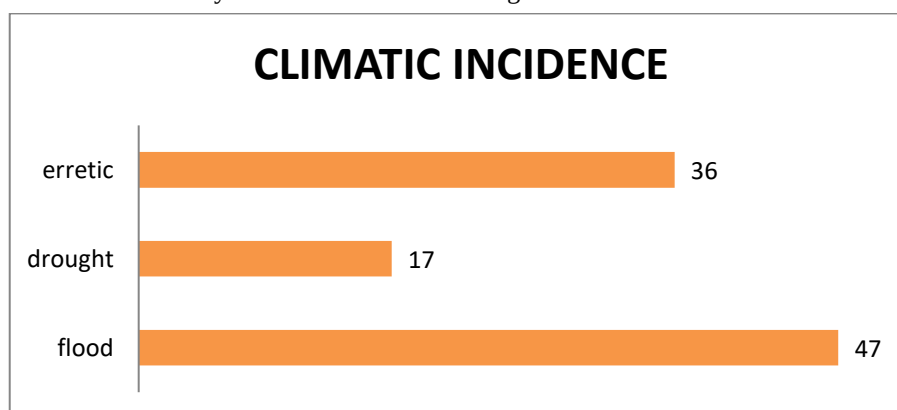


Figure 3.3

Source: Fieldwork 2025

In another way round information on the climatic incidence that affect the agro pastoralist farm land was asked and information collected revealed that, 47% (110) stated that climatic incidence that most affect their farmlands is flood and 17% (40) stated that drought is the most climatic incidence that mostly affect their crops, while 36% (86) blamed the erratic rainfall changes.

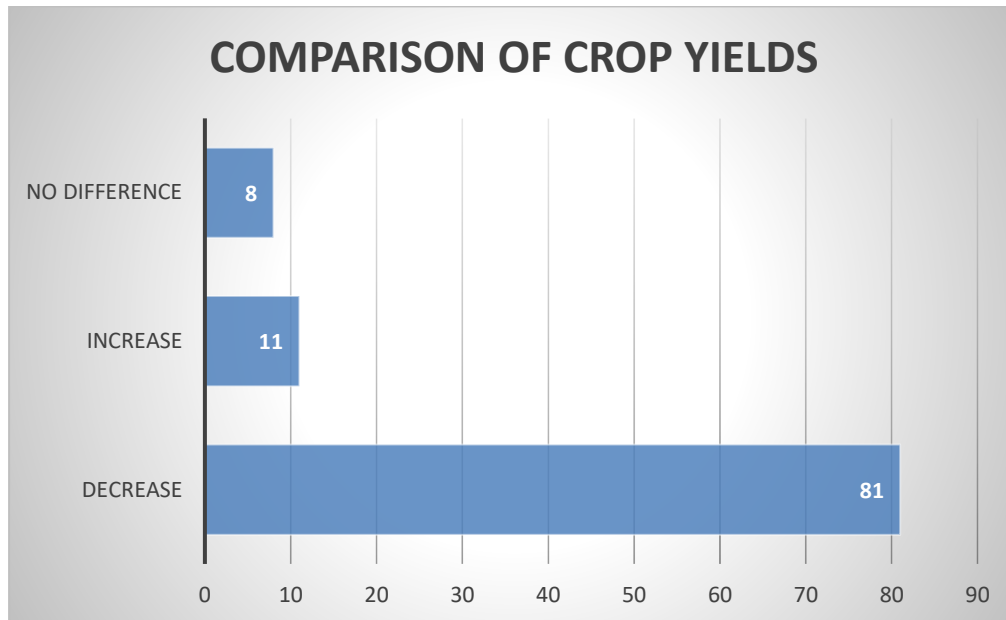


Figure 3.4

Source: Fieldwork 2025

More so, information was further collected on the comparison of crops yield with last 20 years and data provided, stated that 81% (190) agreed that, there is decrease in crops yield when compared to last 20 years and 11% (25) indicated that, there is increase in crops yield when compared to previous years while 8% (21) stated that, there is no difference with the past years.



Figure 3.5

Source: Fieldwork 2025

The figure above indicates that out of 236 agro pastoralist interviewed, result revealed that, they do graze their animal at open savanna land' having 42% (100) and 7% (16) do graze their animal at range land and 51% (120) depend on fadama land to graze their animals.

Therefore, this revelation indicates that presence of river within the study area has greatly help the agro pastoralist to graze their animals in dry and rainy period.

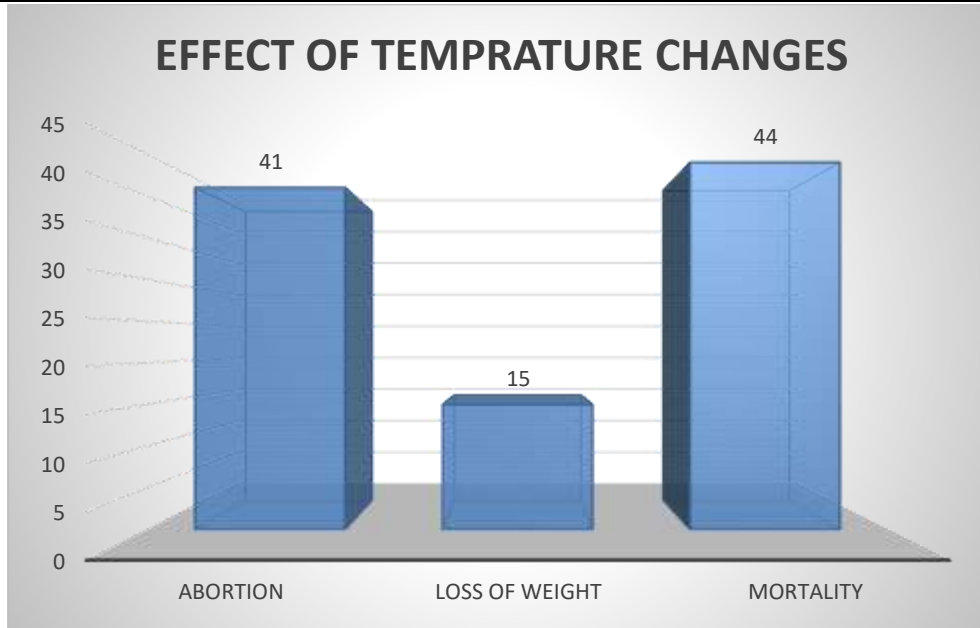


Figure 3.6

Source: Fieldwork 2025

However, question was raised to sourced information from the pastoralists on how changes in temperature affect their animal. It is hereby revealed that, 41% (96) said that changes in temperature affect their animal by causing abortion among female cattle's, sheep's and goats and 15% (36) reported that change in temperature lead to loss of weight among their animals while 44% (104) described the effect to mortality of their animals more especially the young ones in which they have to carry the young ones to shelter belt areas to stay within the canopy of trees (Neem trees) most especially during hot season when the sun is vertically over head of the region. This revelation is supported by maxi et al, (2022) they opine that heat stress reduces estrous period and fertility while increasing the incidence of a estrous and embryonic death. National oceanic and atmosphere administration, (2019), stated that, climate change in Nigeria can have damaging effect on water, supply, food supply, soil composition, human health and livestock's.

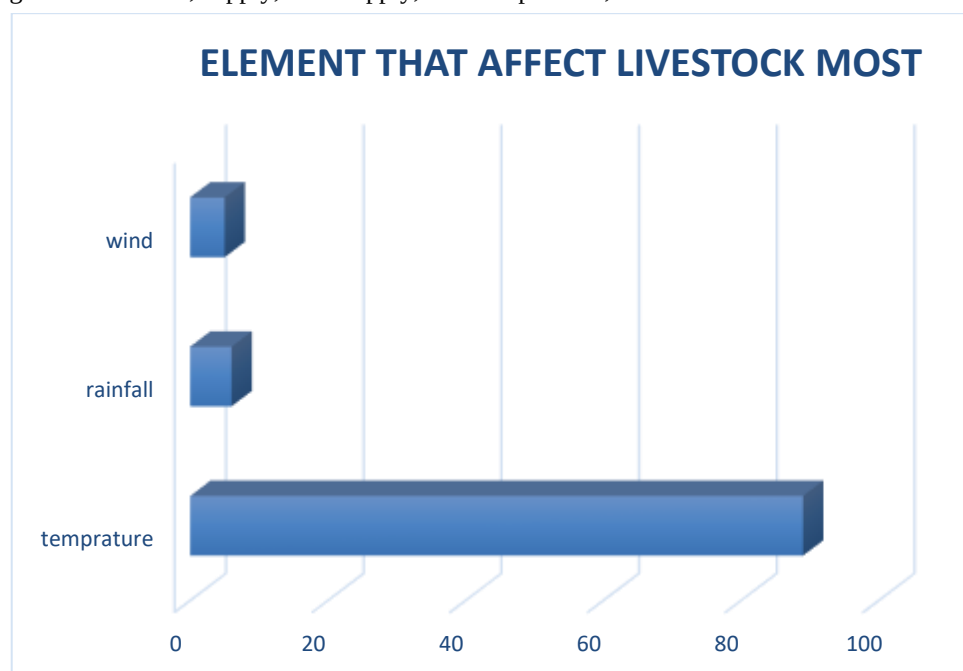


Figure 3.7

Source: Fieldwork 2025

The above figure indicates that, information collected from agro pastoralist in the study area on which climatic element mostly affect animal production in the area, it revealed that 89% (210) stated that, temperature is the most climatic element that affect their animals, 6% (15) said rainfall is the most disturbing element to their animal and 5% (11) said that wind is the strongest element that affect animal production in the area.

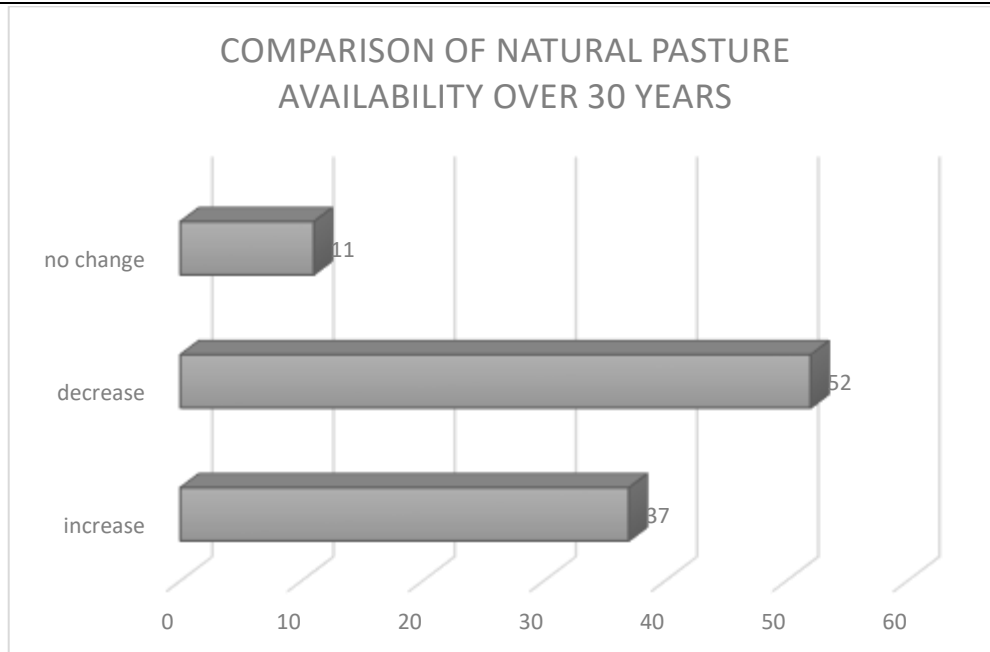


Figure 3.8

Source: Fieldwork 2025

However, question was asked to ascertain the availability of pasture when compared to that of 35 years back and information collected was analyzed. It was here reported that 52% (122) stated that, when compared the pasture with the last 35 years there is decrease in pasture in both quality and composition, and 37% (88) stated that there is increase inof pasture when compared to last 35 years, while 11% (26) described the situation as no changed. This finding may be due to urbanization and increase in population of the area most arable land were converted to residential and industrial purposes.

This maybe the reason why some of these pastoralist-leaving the area to another place and maybe the reason why they have change the pattern of their herding as climate change result in land cover changes.

However, World Bank group, (2021), asserted that climate change greatly impacted the a viability of environmental resources that communities could use.

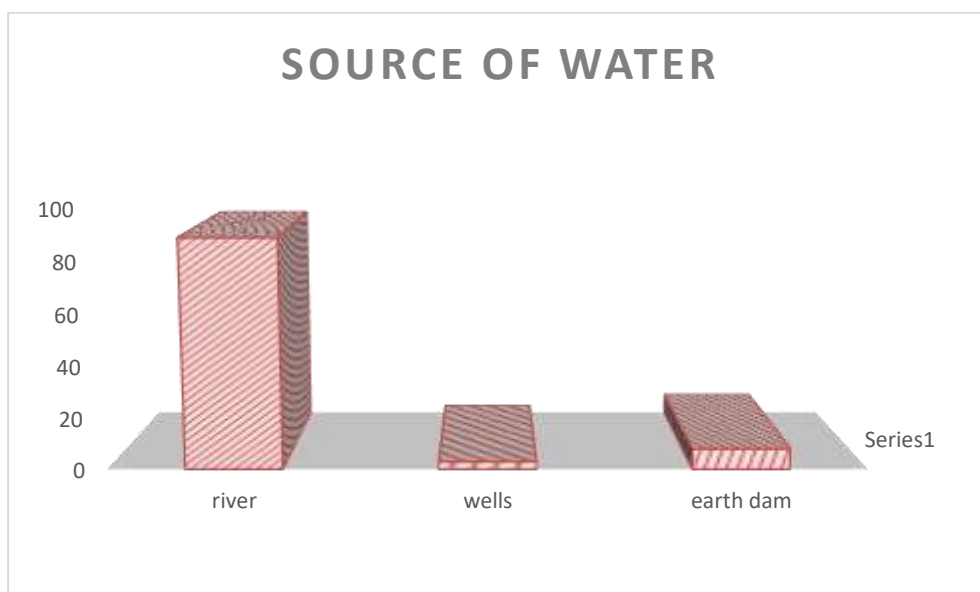


Figure 3.9

Source: Fieldwork 2025

The above figure described where agro pastoralist obtains water for their animals most especially during the dry season period. Information collected indicated that most agro pastoralist almost 89% (210) obtain water from the river in both dry and wet season, and 3% (6) get water from the wells and another 8% (20) depend on earth dam located within their domain constructed by road engineering companies.

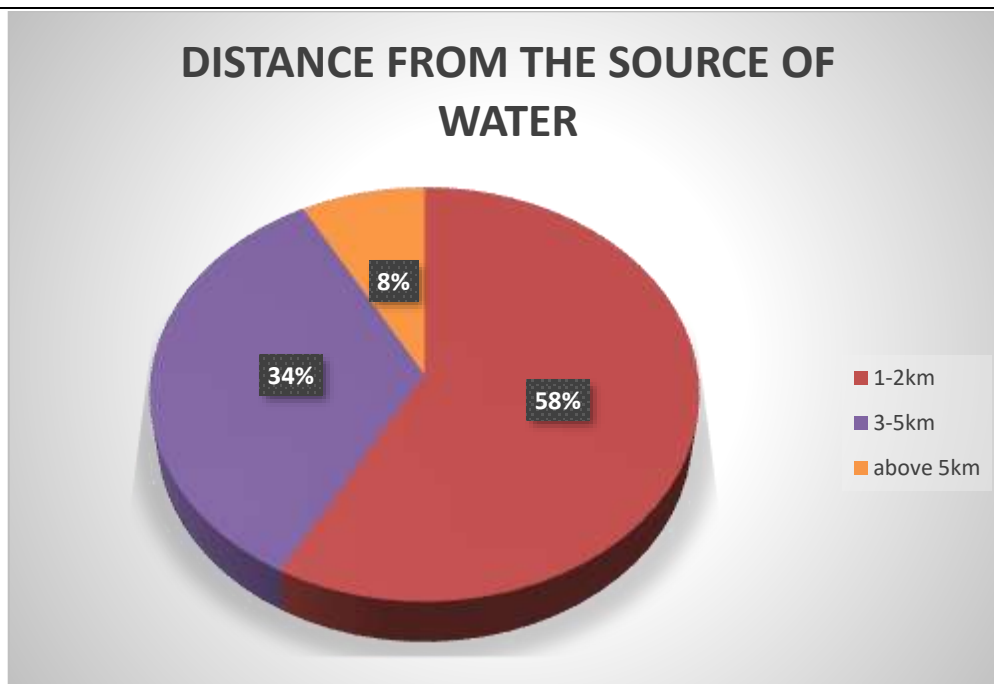


Figure 3.10

Source: Fieldwork 2025

Moreover, information was asked to ascertain the estimated distance from the agro pastoralist domain to the sources of water in their area.

Data collected revealed that 58% (136) described their distance from the source of water to be 1-2 km and 34% (80) described their distance to the sources of water to be 3-5 kilometer and lastly 5% (20) described the distance to the sources of water as above 5 kilometers.

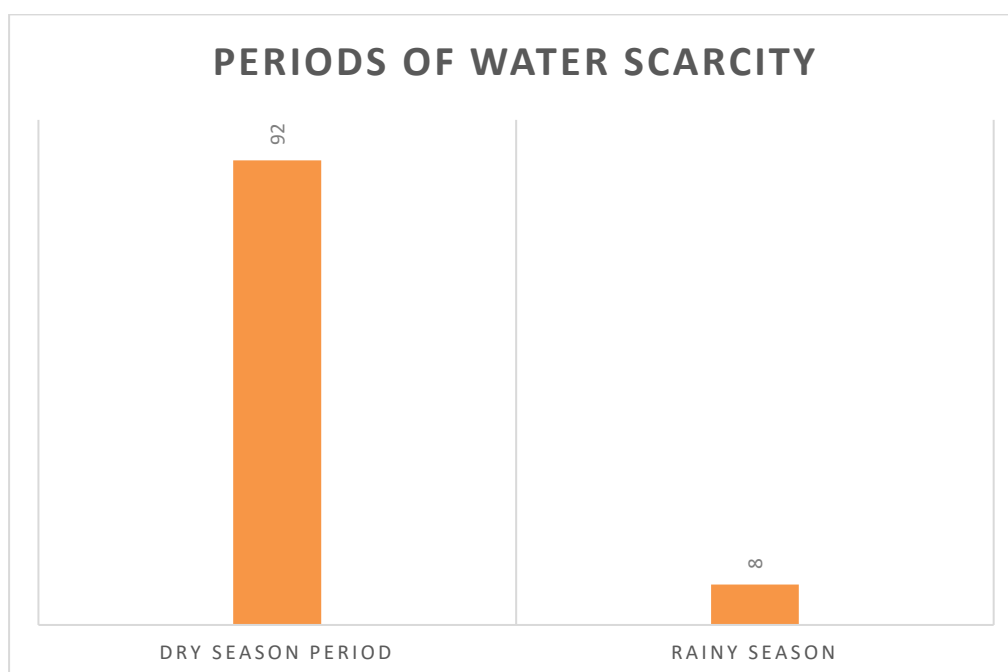


Figure 3.11

Source: Fieldwork 2025

This figure described the period in which the agro pastoralist experienced problem of water shortage in the area. It was reported that 92% (216) reported that the period of water shortage is dry season and 8% (20) described rainy period. This finding may be attributed to the seasonal variation (seasonality) of most rivers of the world as well as decrease in the volume of underground water during the dry season period most especially around April and May in the area. Odijug V, (2010), Lamented that during the dry season in northern Nigeria, the rivers and lakes due to climate variability.

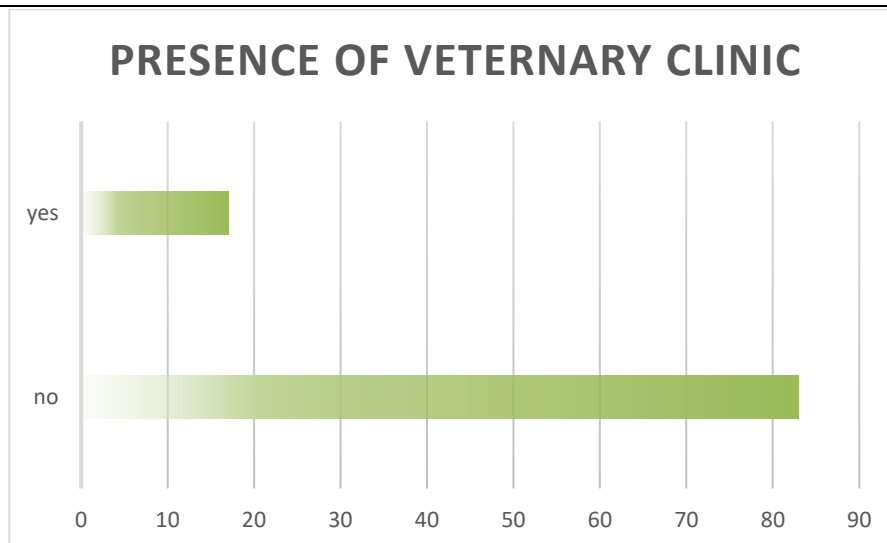


Figure 3.12

Source: Fieldwork 2025

Information was further collected from agro pastoralist on the presence of veterinary clinic within their domain. It is reported that 83% (196) stated that they do not have the facilities within their domain and 17% (40) stated that there is facilities within their domain.

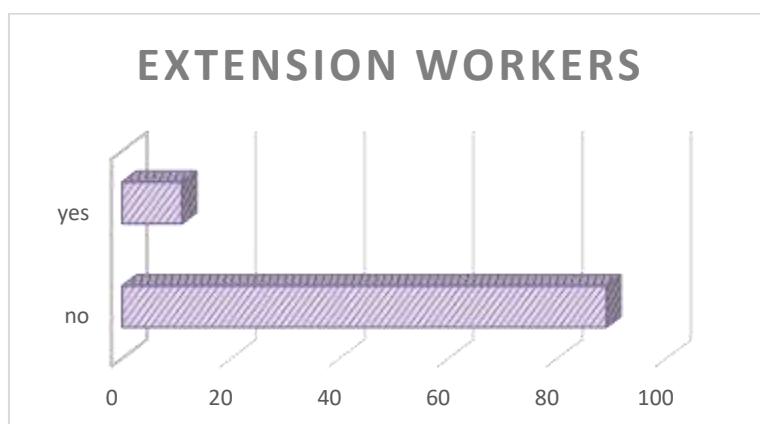


Figure 3.13

Source: Fieldwork 2025

Moreover, information was further collected on either veterinary extension workers do visit them frequently to educate them of new techniques of livestock management due to climate change. The result indicates that 89% (210) reported that there are no such people and 17% (40) stated that such extension workers do not visit them regularly to educate them on changing situation.

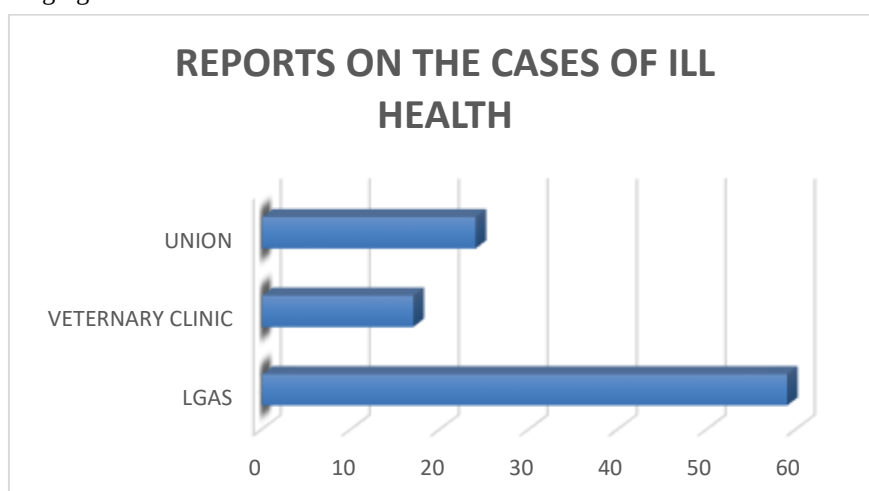


Figure 3.14

Source: Fieldwork 2025

The above figure describes where agro pastoralist report cases of ill health when their animals fall sick or need medical assistance and the result indicated that 59% (140) reports such cases to Local Government Secretariat while 17% (40) goes directly to veterinary clinic around their domain and 24% (56) report their cases to their union for help.

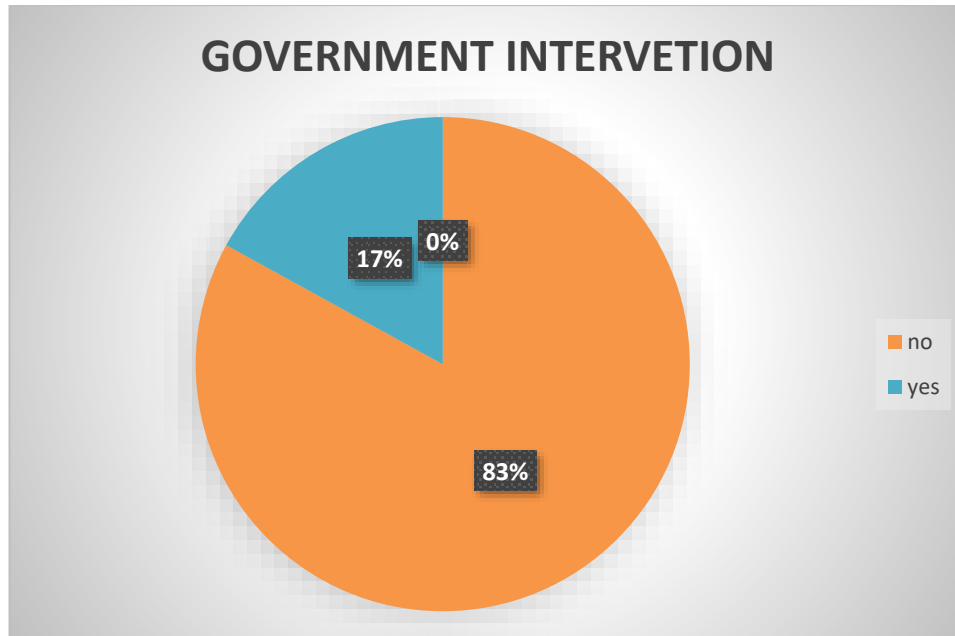


Figure 3.15

Source: Fieldwork 2025

In addition to this, question was asked if the agro pastoralist in the study area have received any aids from Government in term of animal feeds drugs or enlighten campaign on the issue of Climate Change. Information revealed that 83% (196) reported they have not received such gesture and 17% (40) stated that they receive such aid.

Table 3.3: Coping strategies on the Effect of Climate Change

Responses	Frequency	Percentages
Using local resistance breed	150	64
Ranching	50	21
Purchase of animal feeds	36	15
Total	236	100
Effectiveness of strategies played		
Responses	Frequency	Percentage
Very effective	110	47
Effective	80	33
Not effective	46	20
Total	236	100

Source: Fieldwork 2025.

The above table described the coping mechanism adapted by the agro pastoralist in the study area against climate change. Information collected revealed the strategy adopted the use of the local breeds of cattle to mitigate climate change. About 21% (150) adapt ranching method while 15 (36) adapt the purchase of animal feeds when....

In addition, when asked the effectiveness of the strategies, 47 % (110) described the effectiveness of the strategies as effective and 33% (50) described the strategies as very effective and 20 % (46) described it as not effective.

This findings may the reason why local breeds of cattle known as (Gudale) and (Yakana) are more common in the area. A they can adapted the savannah environment than any other breeds. The “Gudale” are hornless and (“Yakana”) are short horn cattle.

COMPERISON OF EARNING

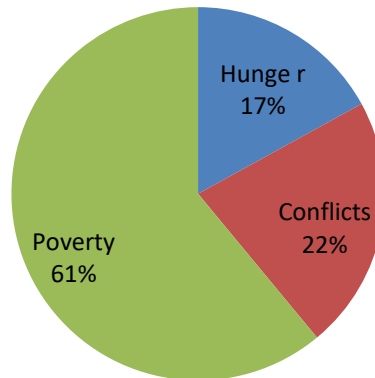


Figure 3.16

Sources: Field work 2025

The figure above explains the effect of the climate change on the livelihoods of the agro pastoralist. Information on comparison of current earning on both crops and livestock revealed that 37% (88) described that there is increase in the earning, and 52% (122) stated that there is decrease in the earning, while only 11% (26) described the situation as no change.

EFFECTS ON LIVELIHOODS

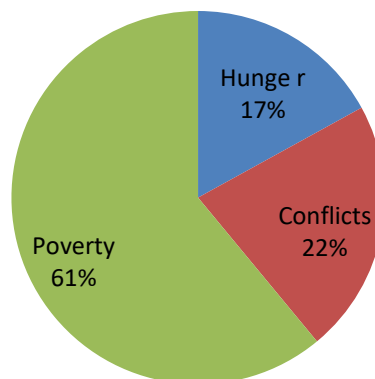


Figure 3.17

Sources: Field work 2025

The above describes how changes in the earning affect the agro pastoralist households in the study area. Information collected and analyzed revealed that 17% (39) indicated that decreases in earning causes hunger and starvation among the households and 22% (52) described the effect to include conflicts among the households and other land users, and 61% (145) described the effect to be the major causes of poverty among agro pastoralist in the study area.

7. SUGGESTIONS

The following are the. Suggestions on how to improve the effect of climate change among households of agro pastoralist in Argungu Local Government Area.

- The Federal Government of Nigeria should do everything possible toward improving the livelihoods of agro pastoralist where ever they are in Nigeria by coming up with policies and programs that has direct bearing on their livelihoods
- The Kebbi State Government should embark on enlighten campaign on the issues of climate change to agro pastoralists.

- The Local Government should train and provide effective extension workers to assist the agro pastoralist with technical knowledge on the way to reduce risk of climate change on crops and livestock management.
- Kebbi State Government should provide adequate animal feeds in the state and should be sell to pastoralist at subsidized rate most especially during prolong dry season.

8. CONCLUSION

Climate change imposed serious problems over the world and not only to the human but include both plants and animals. The magnitude and its dimension has attracted serious concern to academicians, political leaders as well as policy makers. In Nigeria evidence of the change include prolong dry season, extreme weather, dryness of wetlands and water courses. Scientist have blamed nature as the chief causal factor of climate change, but human also contributed to this change via deforestation, emission of greenhouse gases, burning of fossil fuel among others. Agro pastoralist who dominated the northern part of Nigeria, play a vital role in the economic development of the country also suffer serious threat to climate change, as extreme weather condition led to death, abortion and pre mature delivery among livestock as well as spread of infectious diseases associated to changing of weather phenomena. The pastoralist provides dairy products such as meat cheese, hide and skin, milk which greatly improve national treasury. Therefore, the Federal Government should do everything possible to cushion the effect of climate change on this social group by constructions of more irrigation schemes, provision of nutritive feeds and above all establishment of veterinary clinics and provision of animal drugs to agro pastoralists.

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