

Effect of Climate Change on The Yield of Groundnut in Ajingi Local Government Area of Kano State, Nigeria

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Abstract : *The study focused on the effects of climate change on groundnut yield cultivation in Ajingi Local Government Area Kano State. Qualitative data were used for the study through questionnaire administration and a purposive sampling was adopted for equal representation of the area. Statistical ration was used to analyzed data and presented in tables with frequency and percentage. The results of the finding show that greater percentage of the respondents were with view of changing groundnut crops with another as an alternative crop due to the decreasing in amount of rainfall and its uneven distribution. The results revealed that Soybean is an alternative crop. Twenty respondents were selected from each ward making 100 respondents to represent the entire population of groundnut farmers in the study area. In this research purposive sampling is used in selecting respondents. Farmers should think to choose the alternative crops when problems arise on groundnut to have continuous cultivation of farm land. New techniques are also needed such as crop rotation, shifting cultivation etc. Local farmers should be given loan/capital to enable them to enhance the production of groundnut. Intensive programmes need to be established by the government to site a large land mainly for production of groundnut since groundnut is among the major cash crops and it's economic important. Farmers are supposed to monitor environmental conditions and reduce the rate of environmental pollution and climate change.*

Key words: Agriculture, Climate change, Rainfall, Variability, and Running-mean

INTRODUCTION

Climate change is one of the greatest contemporary environmental challenges and is global in dimensions. The rising incident of extreme climatic events associated with climate change are giving the greatest of the concerns (Ariko et al, 2024). The inter-governmental panel on climate change (IPCC, 2007) defined climate change as statistically significant variation in climate that

persists for an extended period, typically decades or longer. It includes shift in the frequency and magnitude of sporadic weather events as well as slow continuous rise in global means surface temperature. Climate change is a change in climate that attributable directly or indirectly to human activities it effects the atmospheric condition of the earth thereby leading to global warming.

Climate change is a recent happening that is attracting attention across the globe. It has an important position in lives of individuals, animals, crops, economics and other aspects of lives in this world. It is a phenomenon that affects all continents of the world, Europe, Africa and Asia. Countries, states, regional and world organization had been devoting time and resources towards climate change. The United Nations is a typical example of international organization that become more concern and concentration on climate change. World economies, developed, developing and underdeveloped are all affected by climate change. Land, sea, and Air are affected by climate change. Populations, demographics, gender, cultures, occupation, among other are all affected by climate change. Agriculture is the borne of every reasonable economy. It is an important pre requisite for industrialization and development.it ensure food production and supply for nutritional and industrial purposes. With the development of climate change and its effects now agriculture is becoming more concern with the change, because rainfall is now kindly showing climate change. Food production is highly affected.

Food and Agricultural Organization of the United Nations (FAO) (2016) reported that as lands are cultivated more intensively, soil degradation increases, production declines, and incomes fall. Likewise, water scarcity caused by prolonged drought and conflicts over water use may induce poorer farmers to abandon their lands and migrate to less affected areas.

Ajingi Local Government Area (LGA), is among the forty-four (44) LGAs of Kano state.it is in the southern part of Kano. It has many resources and potentialities of agriculture production. There is a high significant of farmers population in the area. Several varieties of crops are cultivated on yearly and quarterly basis. The farmers practices mostly rainy season farming, but there is also high dry season farming, like in the other world societies, Ajingi is also affected by climate change on groundnut yields. Hence, this study intends to examine in more details of the effect climate change on groundnut yields in Ajingi. Groundnut is an important crop that is used for different purposes food, industrial and so on

Study Area

Ajingi LGA of Kano State lies between Longitudes 9.0368 (DMs)9°2'12E and Latitude 11.9683 latitude (DMs) 11°58'6N of green which meridian with the Elevation of (feet):1669.above the sea level it has distance of about 72km away from Kano metropolis, it shares border with Gaya local government to the south, from the North West it border with Gabasawa local government to the west by Warawa Local Government and to the North-east by Ringim Local Government Jigawa State.

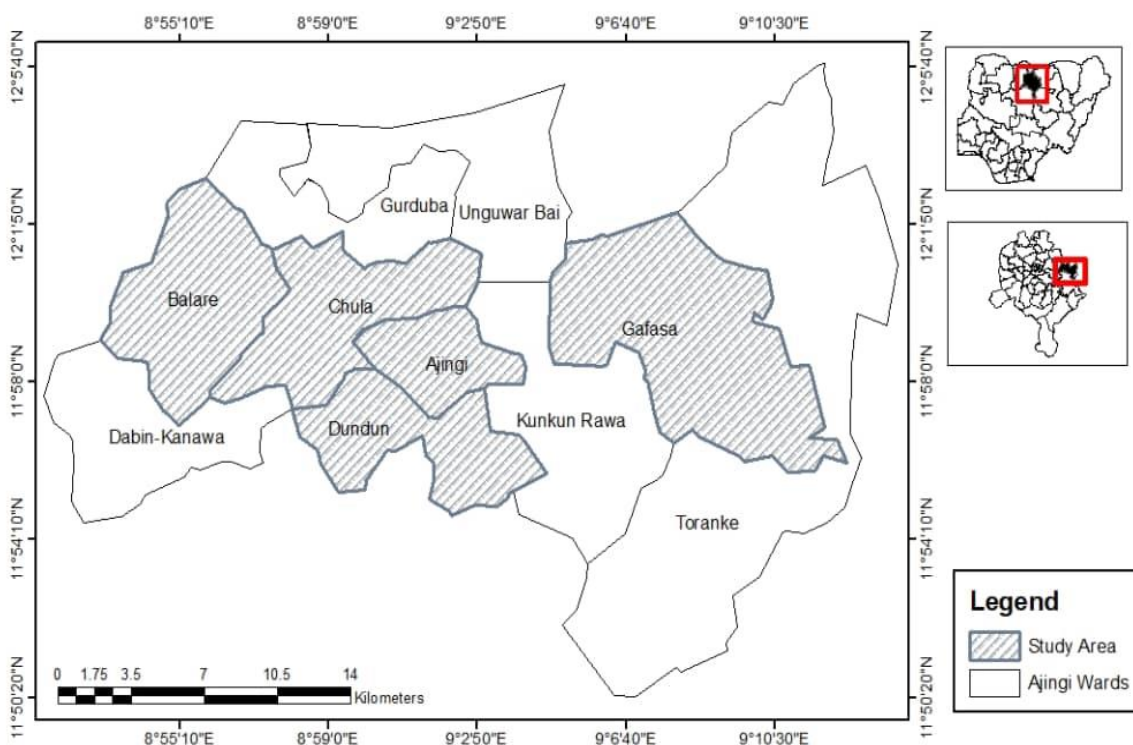


Figure 1- Ajingi Local Government showing the study area

Source: Kano State Geographical Information Systems 2024

Material and Methods

The study employed survey, method of data collection through questionnaire. The population of this research include farmers that cultivate groundnut in the study area. The sampling techniques used in selecting respondents is purposive sampling. Out of 10 administrative wards of the area, a total of 5 wards were purposively sampled to represent the entire LGA. The sampled wards are: Ajingi, Dundun, Balare, Chula and Gafasa. One hundred (100) respondents were selected to represent the entire groundnut farmers in the study area (20 from each five wards).

RESULTS AND DISCUSSION

Sex of the respondents

Table (4.1) show that the majority for the respondents are male which accounted for (59%), while the female accounted for (41%). This gender imbalance may be related to the facts that women are

in most of the time engaged in child care and other activities in the house which may prevent them from participating in the Exercises. In addition, all the Field assistant are male hence; they cannot interact with women's due to culture, traditional norms and religious affiliation of the community.

Table 4.1: Sex of the respondents

Sex	Frequency	Percent
Male	59	59
Female	41	41
Total	100	100

Source: field work 2024

Marital status

The Below table (4.2) Shows that majority of the respondents are single with average number of 51 which accounted for (51%), While married are 49 and accounted for (49%)

Table 4.2: Marital Status

Marital status	Frequency	Percent
Married	49	49
Single	51	51
Total	100	100

Sources: Field work 2024

Educational qualifications

Table (4.3) Contained the Information on the qualifications of the respondents. From Table (4.3) observed that majority of the respondents have obtained Qur'anic education with (43.0%). Respondents with secondary school level have (26%). Primary level has (23%) while Tertiary Education accounted for (8%). It is important to note that all the respondents claimed to have Islamic education.

Table 4.3: Educational Qualifications

Educational Qualifications	Frequency	Percent
Primary	23	23
Secondary	26	26
Qur'an	43	43
Tertiary	8	8
Total	100	100

Sources: Field work 2024

Type of farming practices

Table (4.4) Shows the types of farming practices by the respondents in the study area. The table clearly shows that most of the respondents engaged in both types of Agriculture (Subsistence and commercial) and accounted for (50.7%). Respondents engaged in commercial agriculture

accounted for (15%). While the respondents that engaged in Subsistence type of agriculture have the highest percentage of (35%).

Table 4.4: Type of Farming practices

Type of Farming practices	Frequency	Percent
Subsistence	35	35
Commercial	15	15
Both	50	50
Total	100	100

Sources: Field work 2024

Respondents views in climate changes

Table (4.5) shows the climatic change in the study area. This table shows that majority of the respondents believed that about changes in the climatic condition, which accounted for (67%). This result agrees with the findings of Ikpe et al. (2023) which reported that farmers in Benue State perceived a change in climate change. While (33%) believed that there are no changes in the study climatic condition in the area under study.

Table 4.5: Respondents views in climate changes

Respondents views climate change	Frequency	Percent
Yes	67	67
No	33	33
Total	100	100

Source: Field work 2024

Impact of climate change to agriculture

Table (4.6) Revealed that the major Impact of climate changes to agriculture in the study is adequate rainfall and accounted for (39%). Twenty-seven percent of the respondents believed that pest and diseases are the major impacts. Flooding accounted for (24%) While dry spells accounted for (10%).

Table 4.6: Impact of climate change to a agriculture

Impacts of climate changes to agriculture	Frequency	Percent
Inadequate rainfall	39	39
Pest and diseases	27	27
Flooding	24	24
Dry spells	10	10
Total	100	100

Source: Field work 2024

Respondents perception about causes of climate change

Table (4.7) shows the causes of climate changes in the study area. This table shows that majority of the respondents believed that the climatic changes is cause by naturally which accounted for (65%). While (35%) believed that the change in climatic condition is due to human activities.

Table 4.7: Respondents perception about causes of climate change

Respondents perception about climate change	Frequency	Percent
Natural activities	65	65
Human activities	35	35
Total	100	100

Source: Field work 2024

Status of Rainfall

Table (4.8) shows the status of rainfall in the study area. This table shows that majority of the respondents believed that the rainfall status is normal which accounted for (43%). While (30%) believed that the rainfall status is increasing. Twenty-two percent (22%) of the respondents believed that the rainfall status is decreasing over the years.

Table 4.8: Status of Rainfall

Status of Rainfall	Frequency	Percent
Increasing	30	30
Decreasing	22	22
Normal	48	48
Total	100	100

Source: Field work 2024

Type of Groundnut planted in the study area

Table (4.9) shows the types of groundnut planted in the study area. This table shows that majority of the respondents are planting *Arachis hypogaea* which accounted for (65%). Respondents engaging in planting kersting groundnut are (20%). While (15%) of the respondents engaged in planting Malgache groundnut.

Table 4.9 Type of Groundnut planted in the study area

Types of Groundnut planted in the study area	Frequency	Percent
Kersting groundnut	20	20
Malgache groundnut	15	15
<i>Arachis hypogaea</i>	65	65
Total	Total	100

Source: Field work 2024

New hybrid seeds of groundnut

Table (4.10) Shows the new hybrid seeds of groundnut in the study area. This table shows that majority of the respondents using hypogaea which accounted for (68.0%). While (32%) revealed that they use fastigiata seeds.

Table 4.10: New hybrid seeds of groundnut

New hybrid seeds of groundnut	Frequency	Percent
Hypogaea	68	68
Fastigiata	32	32
Total	100	100

Source: Field work 2024

Why farmers adapt to new species

This Table (4.11) shows the opinion of farmers on what attracts them to new species of groundnut in the study area. This table shows that majority of the respondents believed high yield of the new species attracts them which accounted for (51%). While (33%) of the respondents believed that the new hybrid seeds of groundnut are drought resistant hence attracts them. (16%) of the respondents believed that the new species of groundnut is easy to cultivate.

Table 4.11: Why farmers adapt to new species

Why do farmers adapt to new species	Frequency	Percent
High yield	51	51
Easy to cultivate	16	16
Drought resistance	33	33
Total	100	100

Source: Field work 2024

Where do you source the hybrid seeds of groundnut?

The Below table (4.12) Shows the where the farmers are sourcing the hybrid seeds of groundnut. It clearly shows that most of the respondents are sourcing the new hybrid seeds through LGA or individuals and accounted for (50%). Forty percent (40%) of the respondents are sourcing their hybrid seeds from the Government. While (10%) of the respondents believed that the NGOs supply their new hybrid seeds of groundnut.

Table 4.12: Where do you source the hybrid seeds of groundnut

Where do you source the hybrid seeds of groundnut	Frequency	Percent
Government	40	40
NGOs	10	10
LGA/Individuals	50	50
Total	100	100

Source: Field work 2024

What alternatives crops replaces groundnut nowadays

Table (4.13) Shows the alternatives crops that replaces groundnut seeds in the study area. Respondents with (52%) believed that sesame seeds are the main crops that replaces groundnut seeds in the study area. Twenty-eight percent (28%) believed that soybean Is the crops that replaces groundnut seeds. While (20%) of the respondents believed that the carrots are another crop that replaces groundnut seeds in the study area. Ukoh et al.(2024) and Ikpe et al. (2016) opined that farmers in Sokoto uses shift in crops produced as an adaptation strategy to the effects of climate change.

Table 4.13: What alternatives crops replaces groundnut nowadays

What alternatives crops replaces groundnut nowadays	Frequency	Percent
Sesame	52	52
Soybean	28	28
Carrot	20	20
Total	100	100

Source: Field work 2024

What kind of pest Diseases affecting the Groundnut plant?

Table 4.14 shows the kind of pest and diseases affecting the Groundnut plant in the study area. This table shows many of the respondents which accounted for (58%) believed that the groundnut rosette is the major pest and diseases affecting the Groundnut plant. Twenty-four percent (24%) of the respondents believed that the groundnut streaks are the major pest/diseases affecting the Groundnut plant. While (18%) believed that termites are the major diseases affecting the Groundnut plant in the study area.

Table 4.14: what kind of pest Diseases affecting the Groundnut plant

What kind of pest and diseases affecting the Groundnut plant	Frequency	Percent
Termites	18	18
Groundnut rosette	58	58
Groundnut streaks	24	24
Total	100	100

Source: Field work 2024

When are the groundnut plants being attacked by the pest's diseases most?

The table 4.15 below revealed that when the groundnut plants attacked by the pests and diseases in the study area. This Table shows that majority of the respondents which accounted for (66%) believed that the groundnut plants is being attacked by the pests and diseases during the period of germination. While (34%) believed that the groundnut plants is being attacked by the pests diseases during vegetative and

Table 4.15: When are the groundnut plants being attacked by the pest's diseases most

When are the groundnut plants being attacked by the pests diseases most	Frequency	Percent
Germination period	66	66
Vegetative and flowering stage	43	34
Total	100	100

Source: Field work 2024

Summary

The research work on the effect of climate change on groundnut yields cultivation in Ajingi LGA, Kano state. The data was collected using questionnaire administration during Raining season (Damina). The results of findings show that majority of respondents shows that rainfall is unevenly distributed across the year months as against olden years and few respondents revealed that rainfall is decreasing per annum and even distributed. The results also show that greater percentage of the respondents were with the view of changing groundnut with sesame as an alternative crop.

CONCLUSION

Conclusively the study focused on the Effects of climate change on groundnut yield cultivation in Ajingi LGA. Qualitative data were used for the study through questionnaire administration and a simple purposive sampling was adopted for equal representation of the area. The data was analysed using descriptive statistics method. The results of the findings show that the greater percentage of the respondents were with the view of changing groundnut crops with another as an alternative crop due to the decreasing in amount of rainfall and its uneven distribution. The results revealed that other crops such as sesame, soybean etc are now replacing groundnut crops in the study area.

Recommendations

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

- i. Farmers should choose the alternative crops when problems arise on groundnut to have continuous cultivation of farmland. New techniques are also needed such as crops rotation shifting cultivation etc.
- ii. Government should be given loans/Capital to local farmers to enhance the production of groundnut.
- iii. Intensive programmes need to be established by the government to side a large land mainly for production of groundnut since groundnut is among the cash crops and its economic important.
- iv. Farmers are supposed to monitor environmental conditions and reduce the rate of environmental pollution.

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