



FARMERS' PERCEPTION ON THE EFFECTS OF CLIMATE CHANGE ON YAM PRODUCTION IN PLATEAU STATE, NIGERIA

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ABSTRACT

The study examined farmers' perception on the effects of climate change on yam production among farmers in Plateau State, Nigeria. The objectives of the study had specific objectives as were to describe the socio-economic characteristics of yam farmers in the study area ; determine yam farmer's perception of the effects of climate change; identify yam farmers' sources of information on the effects of climate change and describe the constraints to yam farmers in the adaptation strategies of climate change to of climate mitigation strategies of the effects of climate change in the study area Multi-stage sampling techniques were employed in selecting 321 respondents. Data were collected through the administration of structured questionnaire and analyzed using descriptive statistics. The findings revealed that the majority of the respondents were male 70.9% and married (71.2%), with a mean age and household size of 43 years and 10 persons, respectively. Majority (58.6%) had formal education (primary, secondary or tertiary). The mean farming experience (14 years while farm size was 6.35ha). The finding also revealed that respondents perceived climate change having serious adverse effects on yam production as indicated by mean scores in reduction in soil fertility(Mean=3.1), shortage of water,(Mean =3.1) poor germination(Mean=3) and incessant flooding with a mean score of 3.1, 3.1, 3.0 and (Mean =3.0) respectively. The results also revealed that Majority (55.4%) of the respondents reported that the nature of climate change effects moderately reduced yam yield moderately reduced yam yield while 25.3% reported that it reduced yield. The findings further revealed that farmers relied heavily on personal experience ranked 1st (96.8%), markets (94.9%), fellow farmers (92.7%), and village/market meetings (89.2%) to source of information on climate change. The major constraints to adaptation of climate change mitigation strategies included inefficiency of information sources (Mean = 2.8), high cost of irrigation facilities (Mean = 2.8), and inadequate government support (Mean = 2.7).The study concluded that farmers in the study area clearly perceived climate change as a serious threat to yam production. Sources of information on climate change were mainly through the of personal sources of information. Therefore, improving institutional support systems and reducing structural barriers are critical to strengthening climate resilience among yam farmers. It is recommended that yam farmers' socio-economic status should be enhanced to enable them afford and adopt proven technologies that would mitigate climate change and Extension agents who are supposed to be in close contact with the yam farmers should be trained on weather forecasts interpretation so as to disseminate the same needed information to their contact farmers on Adaptive strategies, such as Climate Smart Agriculture and climate-resilient crop varieties should be encouraged for adoption.

Keywords: Perception, Climate, Change, Effects, Yam Farmers

INTRODUCTION

Agriculture contributed to 22.35 percent of the total Gross Domestic Product (GDP) and remains the foundation of the Nigerian economy, providing livelihood for most Nigerians and generating millions of jobs. (FAO, 2021) Nigeria's agricultural sector significantly contributes to the economy, accounting for Over 70 percent of Nigerians workforce engage mainly at a subsistence level (David, 2021). Despite the contribution to the economy, one of these challenges is climate change. In order to ensure food security, we need to understand the climatic changes around us and how it affects



agricultural production. Climate change (CC) occurs as a result of global warming due to the depletion of the ozone layer in the atmosphere. The ozone layer prevents heat from the sun from reaching the earth at a high intensity, but it gets depleted when certain gases are released into the atmosphere from human and natural factors. These greenhouse gases, (as they are referred to), include carbon monoxide, carbon-dioxide, sulphur dioxide, methane and chlorofluorocarbon (Oladipo, 2022). Greenhouse gases in the form of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and chlorofluorocarbons (CFCs), trap infrared radiation from the Earth's surface and cause the greenhouse effect. Also, human activities, such as fossil fuel combustion, deforestation, and some chemical manufacturing activities have led to an increased concentration of greenhouse gases. The emission of greenhouse gases from gas flaring, open burning, vehicle emissions, deforestation, and use of solid fossil fuel for cooking are some of the causes of climate change in Nigeria.

Climate change perception is a complex process that encompasses a range of psychological constructs such as knowledge, beliefs, attitudes and concerns about if and how the climate is changing (Whitmarsh and Capstick, 2018). Perception is influenced and shaped, among other things, by the individuals' characteristics, their experience, the information that they receive, and the cultural and geographic context in which they live (Van der Linden, 2015; Whitmarsh and Capstick, 2018). Farmer's climate change perception has three dimensions. First, how farmers understand the term "climate change" second, how farmers conceptualize what constitutes climates change, and third, how they experience of climate change shapes their attitude toward the concept. Farmers' perception on climate change is determined by a number of factors such as access to information, extension services, education, experience, resource availability. In practice, farmers take decisions in the context of their own environment, and differences may exist between perceived and real environments. Therefore, understanding farmers' perceptions about climate change can be seen as a condition for the design and successful implementation of adaptation policies in agriculture. Also, it should be noted that perception is a subjective phenomenon, therefore different people in the same locality might construct different perceptions of climate change even though they experience the same weather patterns (Simelton *et al.*, 2013).

Climate change generally has a great effect on the food security, and the livelihood of the people, it is evident in an increase of diseases and pests, extreme climatic events such as flooding, extreme heat, and drought has led to soil degradation thereby declining agricultural production and migration of farmers from rural to urban regions thereby affecting development of rural regions in the country (Botai and Mabhaudhi, 2021). Also, Nigeria's climate has been changing and this is evident in the increase in temperature; variable rainfall; rise in sea level and flooding; drought and desertification; land degradation and many more frequent extreme weather events. Human infrastructure is also threatened by changing in climate, with evidence of encroachment of coastlines, stress to the energy grid, decreased hydroelectric power supply and shifting structures or landscapes, loss of shelter, roads, and farmlands due to erosion in some parts of Nigeria has reached a point where this calls for urgent actions, (Oladipo, 2022). Droughts have also become a constant in Nigeria, and are expected to continue in Northern Nigeria, Lake Chad and other lakes in the country are drying up and at risk of disappearing. Temperature has risen significantly since the 1980s. Climate projections for the coming decades reveal a significant increase in temperature over all the ecological zones (Haider, 2022).

Nigeria ranks as the leading producer of white yams in the world, accounting for 66% (approximately 50.1 million tons) of annual global production (FAO, 2021). There is no exact up-to-date statistical data for yam production in Plateau State, Nigeria, as official figures are often released annually or less frequently by government bodies like the National Bureau of Statistics (NBS). However, Plateau State is identified as a significant agricultural region known for producing various crops, including yam, alongside grains, vegetables, and other fruits. Farming in Nigeria is characterized by smallholder farmers, who typically practice subsistence farming. Yam farming which rely mostly on rainfall and relatively moderate temperatures has been in difficulties with the current changes in the climate system especially the high variation in temperatures and rainfall patterns in the cultivation areas



Despite being the world's top producer of yams, there is paucity of research study on farmers' perception of the effects of climate change on their production in the study area. This hinders the development of effective policies and intervention to support yam farmers in building resilience to climate change, unfortunately exacerbating their vulnerability and undermining the sustainability of yam production. This research gap serves as motivation for my study to investigate and elucidate the perceptions and responsiveness of yam farmers to climate change in the study area. The study addressed the following specific objectives were formulated as;

- i. describe the socio-economic characteristics of yam farmers in the study area;
- ii. determine yam farmer's level of perception of the effects of climate change;
- iii. identify yam farmers' sources of information on the effects of climate change; and
- iv. describe the constraints to yam farmers in the adaptation strategies to mitigate the effects of climate change in the study area.

METHODOLOGY

Description of the Study Area

The study was carried out in Northern and South zones of Plateau State; Plateau State has 17 Local Government Areas which are divided into three agricultural zones, namely; Plateau North, Plateau Central and Plateau South. The State has a land mass of about 26,899km² of which more than 56% is land. (PLAGIS, 2020). It is located between Latitude 8° 24'N and 10° 38'N and Longitude 8° 32' and 10° 38' East, (PLAGIS, 2020). Plateau State is celebrated as "The Home of Peace and Tourism". The State had a population of 3,206,531 in 2006 population census but had a projected population of about five million four hundred thousand, nine hundred and four people (5,400,974), while the projected population of selected LGAs 1,336,900 at 2.4% annual population growth rate (NPC, 2006; NBS, 2024).

Plateau State has a near temperate climate with an average temperature of between 18° and 22° C. Harmattan winds caused the coldest weather between December and February. The warmest temperatures usually occur in the dry season months of March and April. The mean annual rainfall varies from 131.75 cm (52 in) in the southern part to 146 cm (57 in) on the Plateau. The highest rainfall is recorded during the wet season months of July and August. Economic activities on the Plateau State, primarily revolve around agriculture, particularly the cultivation of areas are potatoes, yam, cassava, rice, maize, guinea corn, fruits, and vegetables like avocado pear, strawberries, cabbage, carrot, cucumber etc which engages a large percentage of the population. Livestock production on the Plateau include cattle breeding/fattening, sheep and goat, poultry (broilers & layers), quails turkey, piggery, but poultry production (broilers & layers) is ranked 1st as a predominant livestock activity followed by cattle production. (Investors' Guide, 2021).

Sampling Techniques and Sample Size

Multi-stage sampling technique was employed in selecting the respondents for the study. The first stage was the purposive selection of two zones which are Southern and Northern zones in the state due to their prominence in yam production. The second stage involved the purposive selection of three (3) Local Government Areas (LGAs) from each zone. In the Southern zone, are Mikang, Qua'anpan and Shendam LGAs while Northern zone are Bassa, Jos East and Riyom LGAs. The third stage involved purposive selection of two Districts from each of the LGAs due to their dominance in yam production which gave a total of 12 Districts. In the fourth stage, systematic sampling technique was used to select two yam farming communities from each of the district giving a total of 24 farming communities. In the final stage, random sampling technique was used to select 15% of total number of yam farmers in each selected community (sampling frame) of the six LGAs. This gives a total number of 321 respondents in the study area.

Methods of Data Collection

Data were collected using structured and validated questionnaire and interview schedule. The literate yam farmers were given the questionnaire to fill while the interview schedule was used to collect information from the illiterate ones. The questionnaire consisted of eight sections A, B, C and D to



achieve the objectives of the study. The secondary data were obtained from Nimet and related Literatures, Journals, and other materials like textbooks, ADP official documents and online sources.

Methods of Data Analysis

The data generated were analysed using descriptive statistics, mean score and standard deviation to achieve the objectives of the study. An analytical framework for a Likert scale involves using the scale to collect quantitative data on attitudes or opinions, then applying statistical models to interpret the results. The framework includes designing statements with symmetrical response options. A five-point Likert scale to determine the mean scores was used to achieve objective. That is, examine the constraints to yam farmers in the adaptation strategies to mitigate the effects of climate change. Likert scale of Strongly severe (5), severe (4), Undecided (3) Less severe (2) and Not severe (1). The mean score is $5+4+3+2+1 = 15/4 = 3.0$ (threshold). Based on the weights assigned, a midpoint of 3.0 was obtained. The decision rule is that a mean score of 3.0 and above indicates agreement with the statement while a mean score of less than 3.0 posits disagreement with the statements of constraints.

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RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Respondents

The result from Table 1 revealed socioeconomic characteristics of the respondents which provide a foundational understanding of the yam farming community and its capacity and vulnerability of yam farmers in study area to respond to climate change.

These variables are essential in climate-change studies because they influence farmers' perception, sensitivity, and adaptive responses to environmental changes. Empirical evidence consistently shows that age, household size, farming experience, farm size, and income significantly determine farmers' awareness of climate change and their ability to respond effectively (Adeagbo *et al.*, 2021; Oluwatimilehin & Ayanlade, 2023).



Table 1: Socioeconomic Characteristics of the Respondents (n=316)

Variables	Frequency	Percentage (%)	Mean ± SD [Min, Max]
Age (years)			43.07 ± 12.25 [19, 68]
15–24	17	5.4	
25–34	68	21.5	
35–44	74	23.4	
45–54	107	33.9	
55–64	28	8.8	
65 and above	22	7.0	
Farm size (ha)			6.35 ± 9.69 [1, 40]
0–4.9	248	78.5	
5–9.9	35	11.1	
10–14.9	4	1.3	
30–34.9	11	3.5	
35 and above	18	5.7	
Household size			10.38 ± 8.70 [1, 35]
1–5	100	31.6	
6–10	97	30.7	
11–15	31	9.8	
16–20	17	5.4	
21–25	43	13.6	
26–30	22	7.0	
31 and above	6	1.9	
Farming experience (years)			18.99 ± 9.63 [2, 35]
0–4	29	9.2	
5–9	31	9.8	
10–14	39	12.3	
15–19	38	12.0	
20–24	71	22.5	
25–29	33	10.4	
30 and above	75	23.7	
Sex			
Male	224	70.9	
Female	92	29.1	
Marital status			
Single	81	25.6	
Married	225	71.2	
Divorced	4	1.3	
Widowed	5	1.6	
Widower	1	0.3	
Educational level			
No formal education	1	0.3	
Adult education	1	0.3	
Primary education	117	37.0	
Secondary education	127	40.2	
Tertiary education	70	22.2	

Source: Field Survey, 2025

The result from Table 1 revealed that the mean age of the respondents was 43.07 years indicating that the respondents are largely in their economically active years. This is a strong advantage for yam production because yam is labour-intensive and requires physical energy for land preparation, staking, weeding, harvesting, and post-harvest handling. At the same time, middle-aged farmers often have enough farming experience to recognize shifting rainfall patterns, drought spells, and rising heat stress. Studies have shown that age can influence both awareness and the intensity of adaptation, although the direction is not always uniform; younger farmers may be more open to innovation, while



older farmers may rely more on accumulated local knowledge. Adeagbo *et al.* (2021) found age to be among the significant determinants of adaptation strategy adoption among smallholder farmers in southwest Nigeria, and Dyanty *et al.* (2025) also reported that age was part of the socioeconomic mix affecting adaptation decisions.

Farm size is small for most respondents, with 78.5 percent operating on less than 5 hectares and a mean farm size of 6.35 hectares. This pattern is typical of smallholder yam systems and has direct implications for adaptation. Small farms often make it harder to adopt capital-intensive practices such as irrigation, large-scale mechanization, or major drainage works, but they may also encourage closer farm management and quicker adjustment of planting time or crop combinations. Adeagbo *et al.* (2021) and Maiwashe Tagwi and Khoza (2024) both show that farm size is one of the factors associated with adaptation behavior, and the broader review by Manono *et al.* (2025) emphasizes that farm-scale characteristics are central to whether farmers can adopt climate-smart practices. This disagrees with the study of Akinola (2019), revealed that the average farm size of was 1.1 hectares. Small farm sizes, often a result of fragmented land inheritance systems, limit respondents' ability to generate surplus income for reinvestment in climate-smart technologies such as irrigation systems, drought-tolerant seed varieties, or soil conservation structures (Muyanga and Jayne, 2019). This characteristic of smallholder dominance is consistent with the structure of yam farming across West Africa, as reported by Andres *et al.* (2021), who note that yam production is central to the livelihoods of millions of smallholder families, yet these respondents remain highly vulnerable to environmental and economic shocks.

The results also showed that the respondents had small farm structure suggests that low cost adaptation options such as mulching, intercropping, improved seed and changing in planting dates are likely to be more feasible than high cost technologies. Household size has a mean of 10.38, which is relatively large. This matters in two ways. First, a larger household can provide the family labor needed for labor-intensive yam production and can reduce the cost of hired labor. Second, large households also increase consumption pressure, meaning the farm must produce enough to support more dependents, which can make climate shocks more damaging. The literature shows that household size is often associated with adaptation because it affects both labor availability and financial pressure. Adeagbo *et al.* (2021) found household size to be one of the significant variables influencing adaptation among farmers in southwest Nigeria, and the yam study from Nasarawa also identified household size among the major factors influencing adaptation choices. The findings disagree with Akinola, (2019), study showed the average farming household size of yam farmers in the study area was five. In the context of climate change, this has a dual implication. On one hand, a large household provides a readily available labour force for labour-intensive adaptation practices like mulching, making ridges, and intensive weeding (Wuepper *et al.*, 2020).

In addition, the findings revealed that yam farmers had complex role of household size is highlighted by Maggio and Sitko (2019), who found that while family labour is critical, larger household size can also correlate with higher poverty level, thereby constraining investment. A large household structure may therefore function as both a support and a constraint, depending on whether the household has enough productive labour and income. The farming experience is a mean of 18.99 years. This is one of the strongest assets in the data set because long experience improves farmers' ability to notice climate anomalies, compare past and present seasons, and select local responses that have worked before. Experience also builds practical knowledge of soils, rainfall timing, yam varieties, and pest patterns. However, experience does not automatically guarantee adoption of modern adaptation measures; sometimes it increases attachment to traditional methods. Even so, most recent studies still treat farming experience as a major determinant of adaptation. Adeagbo *et al.* (2021) found farming experience to be significant in climate adaptation decisions, Madaki *et al.* (2023) showed that climate knowledge is reinforced by repeated exposure to climate events, and Adejo *et al.* (2024) identified farming years as important in yam adaptation behavior.

The moderate-to-high farming experience suggested strong indigenous knowledge of rainfall patterns, soil behaviour, and pest cycles. Experienced respondents likely recognized gradual climatic shifts and adjusted planting calendars accordingly. However, long-term experience may sometimes encourage reliance on traditional knowledge, potentially limiting openness to modern climate



forecasting tools. Adaptation effectiveness depends on combining indigenous knowledge with scientific information. Tanko *et al.* (2021) in Nasarawa State reported that farming experience positively influenced perception accuracy in yam production.

Furthermore, the results showed that majority (67.1%) of the respondents acquired their land through inheritance. Method of land acquisition is dominated by inheritance, which accounts for 67.1% of the respondents being the most common. Furthermore, the results showed that majority (67.1%) of the respondents acquired their land through inheritance, points to a land tenure system that provides a degree of customary security but lacks formal title. Inherited land often gives farmers stronger security of use than short-term leasing, and that can encourage investment in perennial soil improvements, manure management, and other long-term adaptation measures. While 24.4%, 7.3% and 1.3% had acquired land through purchase, gift and leasehold which has a major implication for adaptation.

Respondents’ Perception on Effects of Climate Change on Yam Production

The results in Table 2 showed that all the listed variables were perceived as effective effects of climate change on yam production, given that their mean scores are at or above the threshold of 3.0. This suggests a strong consensus among respondents that climate variability is already exerting significant influence on yam productivity, farm management practices, and production costs. The predominance of production-related impacts further indicates that farmers are not only aware of general climatic changes but are experiencing direct agronomic and economic consequences.

Table 2: Perception of Respondents on Effects of Climate Change on Yam Production

Variables	Mean	Remark
Unpredictable Planting time	2.9	Effective
Yam spoilage in soil	3.1	Effective
Increased use of fertilizer	3.3	Effective
Decreased soil nutrient	3.2	Effective
Disease prevalence	3.0	Effective
Increased weeds growth	2.9	Ineffective
Stunted growth	3.1	Effective
Low yield	3.6	Effective
Increased cost of production	3.0	Effective
Unpredictable floods	3.1	Effective
Long lasting drought	2.6	Ineffective

Source: Field survey, 2025 Mean score <2.5=Not effective ≥2.5=Effective

Table 2 shows the distribution of yam farmers based on their perception on effect of climate change. Using 5-point Likert rating scale, where the variable whose mean is 3.0 and above is assigned with perceived effect of climate change effective while that whose mean is below 3.0 is assigned ineffective.

The highest mean score was recorded for low yield (3.6), indicating that reduced productivity is the most effective perceived impact of climate change on yam production. This implies that farmers are experiencing tangible declines in output, which directly threaten household income and food security. Low yield may result from erratic rainfall, drought stress, pest infestation, and soil nutrient depletion. The implication of this finding is that farmers are likely to adopt yield-enhancing adaptation strategies such as improved seed varieties, soil fertility management, irrigation practices, and crop diversification to cushion the effect of declining productivity. Similar findings were reported by Garba *et al.* (2024) in Katsina State, where declining yields were strongly linked to rainfall irregularities and rising temperatures. Likewise, Olanrewaju *et al.* (2024) in Kwara State found that yield decline significantly motivated adoption of climate-smart agricultural practices among root crop farmers.

The mean score of (3.1) for yam spoilage in soil indicates that respondents perceive post-planting losses due to excessive moisture, flooding, or soil-borne pathogens as effective. Climate variability, particularly unpredictable rainfall and flooding, can cause rotting of yam tubers before harvest. The implication is increased vulnerability to production loss even before crops reach maturity. Farmers may respond by improving drainage systems, planting on ridges or mounds, and adopting



disease-resistant varieties. Ajayi and Olufemi (2024), in Ondo State, documented increased tuber rot associated with excessive rainfall events. Similarly, Adamu *et al.* (2023) in Taraba State reported that irregular heavy rainfall contributed to pre-harvest spoilage of root crops. Increased use of fertilizers (3.3) shows that there was declining soil fertility and land quality caused by climate change. In the efforts to combat soil infertility, the respondents increased the use of fertilizer with the aim to enhance output despite the high costs of fertilizer.

This finding aligned with Kolapo *et al.*, (2025), who reported that increased agricultural productivity and improved use of farming inputs such as fertilizer have to be at the top of agendas for sustainable agricultural growth because the loss of soil fertility and soil moisture pose the greatest threats to agricultural production. Stunted growth (3.1) and disease prevalence (3.0) were also rated effective, indicating that climate stress is affecting crop physiology and health. Rising temperatures and fluctuating moisture conditions can limit vegetative growth and promote pathogen development. The implication is that farmers may intensify pest and disease control measures, increase fertilizer application, and adopt improved varieties to enhance plant vigor. Eche *et al.* (2023), in Nasarawa State, observed increased disease outbreaks linked to temperature rise. Ibrahim and Yusuf (2022), in Sokoto State, also reported that heat stress contributed to reduced vegetative growth and lower tuber development in yam production systems. The perception of unpredictable floods (3.1) further highlighted the dual nature of climate stress in the study area while drought is dominant, excessive rainfall events also pose risks. Flooding can wash away nutrients, cause soil erosion, and increase crop losses. The implication is the need for improved land management practices such as contour ridging, proper drainage, and selection of flood-tolerant varieties. Bukar and Ali (2024), in Borno State, found that flood events significantly disrupted crop production cycles in vulnerable communities.

In addition, unpredictable planting time (2.9), increased weed growth (2.9), and increased cost of production (2.9), although slightly below the 3.0, were considered effective. Unpredictable planting time implies that rainfall variability disrupts traditional farming calendars, compelling farmers to delay or reschedule planting. This can shorten the growing season and reduce yield potential. Mohammed and Sadiq (2022), in Gombe State, reported that delayed rainfall onset altered planting schedules and negatively affected crop establishment.

The perceived decreased soil nutrient (3.2), suggest that farmers associate climate change with declining soil fertility. This has financial implications, as higher fertilizer demand increases production costs. Tanko and Abdul (2022), in Plateau State, linked climate variability to nutrient depletion and declining soil productivity. The economic implication is reflected in the perception of increased cost of production (2.9), indicating that climate change not only affects biological productivity but also raises input expenses. Usman and Haruna (2022), in Yobe State, reported that adaptation through increased input use significantly raised production costs for smallholder farmers. The perception of long-lasting drought (2.6), remains significant given the earlier findings on moisture stress. Persistent drought reduces soil moisture availability and limits tuber bulking. Garba *et al.* (2024) confirmed that prolonged dry spells significantly constrained root crop productivity in northern Nigeria.

Respondents Sources of Information on Climate Change

The finding in Table 3 presented the respondents' sources of information on climate change. The results revealed that personal experience ranked first (96.8%). The result agrees with Mohammed, *et al.*, (2024), their study showed the source of information on climate change among respondents indicated that personal experience of farmers was found to be a major source of information on climate change adaptation with a mean of (3.777). Personal knowledge allowed respondents to form complex mental reasoning of the climate which can affect their farming operations. This implied that personal experiences make farmers to understand the reality of climate change more easily than less experience ones. This implied that most farmers relied primarily on direct observation of environmental changes. However, this finding disagrees with Chukwu *et al.* (2023), on the sources of information on changes in climatic factors showed that majority (45.42%) indicated that they became informed of changes in climatic factors through radio programmes and announcements, This implies that radio has been the most effective medium of disseminating information on environmental factors to farmers in Ebonyi State. Also, Mobile telephone ranked second (94.9%), The results agreed with Nirmal and Ravi (2021)



who found that telephone calls are cheap and cost effective in getting information to farmers on adaptation practices in order to mitigate the effects of climate change. The growing role of mobile telephone suggested increasing access to communication technologies in rural areas. This aligned with the findings of the International Telecommunication Union (2022), which reported expanding mobile penetration across developing countries. Followed by Radio (92.7%) and village/market meetings (89.2%).

Table 3: Respondents Sources of Information on Climate Change

Variables	Frequency*	Percentage	Rank
Personal experience	306	96.8	1 st
Mobile telephone	300	94.9	2 nd
Radio	293	92.7	3 rd
Village & market meeting	282	89.2	4 th
Agro-dealers	268	84.8	5 th
Markets	227	71.8	6 th
Religious organizations	70	22.2	7 th
Fellow Farmers	67	21.2	8 th
Farmers' cooperative society	66	20.9	9 th
Social organizations	62	19.6	10 th
Television	55	17.4	11 th
Internet	55	17.4	11 th
Extension agents (PADP)	48	15.2	13 th

Source: Field survey, 2025 *Multiple responses

These findings indicated that informal communication networks played a dominant role in information dissemination. Agro-dealers (84.8%) and markets (71.8%) were also important sources of information. However, formal institutional sources ranked relatively low. Social organisations (19.6%), farmers' cooperative societies (20.9%), fellow farmers (21.2%), television (17.4%), internet (17.4%) and Extension agents (PADP) (15.2%) were less frequently cited. The results disagreed with Nose and John (2020), who results revealed that extension workers were the most preferred and reliable source of information to farmers on climate change adaptation in the study area.

This suggested weak agricultural extension outreach in the study area. Similar concerns were raised by the National Bureau of Statistics (2023), which noted limited access of rural farmers to formal agricultural advisory services. The findings therefore implied that climate change information in the study area was largely experiential and peer-based rather than institutionally driven. Strengthening extension services and digital advisory platforms would enhance farmers' adaptive capacity.

Constraints to Adoption of Adaptation Strategies among Respondents

The finding from Table revealed the major constraints to adaptation strategies were rated as “severe” is a powerful testament to the overwhelming challenges faced by respondents. This is not a situation with one or two manageable bottlenecks; it is a complex multilayered system of barriers that collectively trap respondents in a state of low adaptive capacity to adaptation. Untimely access to climate information (2.7), inefficiency of information sources (2.8), complexity of information (2.8), and complexity of information sources (2.7) were all rated severe. These findings suggested weaknesses in climate communication systems within the study area. The Nigerian Meteorological Agency (2023) acknowledged limited penetration of localized climate forecasting services in rural communities. Similarly, FAO (2022) emphasized that effective adaptation requires timely, simplified, and actionable climate information.



Table 4: Level of Constraints to Adoption of Adaptation Strategies among Respondents

Variables	Mean	Remark
Untimely access to climate information	2.7	Severe
Inefficiency of information source	2.8	Severe
Complexity of information	2.8	Severe
High cost of irrigation facilities	2.8	Severe
Lack of access to improved technologies	2.7	Severe
Inadequate of improved drought resistant yam varieties	2.8	Severe
Low level of awareness on climate change	2.7	Severe
Low level of education	2.6	Severe
Deteriorating roads from farm gates to market	2.7	Severe
Withdrawal of labour force to less climate risk ventures	2.6	Severe
Inadequate extension agents	2.7	Severe
Inadequate extension service delivery	2.7	Severe
Inadequate government support	2.7	Severe
High cost of inputs	2.8	Severe
Complexity of information source	2.7	Severe
High cost of irrigation facilities	2.7	Severe
Poor access to improved technologies	2.6	Severe
Adulteration of fertilizers	2.7	Severe
Inadequate of improved agricultural technologies	2.7	Severe

Source: Field survey, 2025<2.5=Not severe ≥2.5=Severe

The finding further showed inadequate extension agents (2.7), poor extension service delivery (2.7), and inadequate government support (2.7) were severe constraints. These findings indicated institutional weaknesses in agricultural advisory systems. The National Bureau of Statistics (2023) reported low extension worker-to-farmer ratios in Nigeria, limiting farmers' access to technical guidance. On the other hand, high cost of irrigation facilities (2.8), lack of access to improved technologies (2.7), inadequate drought-resistant yam varieties (2.8), adulteration of fertilizers (2.7), and high input costs (2.8) were also severe. These constraints indicated limited access to climate-resilient technologies and financial barriers. The World Bank (2023) noted that smallholder farmers in West Africa face significant barriers to irrigation development and agricultural insurance uptake due to high capital requirements.

In addition, deteriorating roads (2.7) and withdrawal of labor to less climate-risk ventures (2.6) were also severe constraints. Poor rural infrastructure increases transaction costs and discourages investment in productivity-enhancing technologies. This is consistent with the findings of comprehensive climate adaptation studies, such as those by Antwi-Agyei *et al.* (2022) and Stringer *et al.* (2020), which emphasize the need for multi-sectoral, integrated approaches to build the adaptive capacity of smallholder respondents in sub-Saharan Africa.

Overall, the findings indicate that constraints to adaptation among yam farmers are multifaceted, encompassing informational, financial, institutional, technological, and infrastructural dimensions.

CONCLUSION AND RECOMMENDATIONS

The study concluded that farmers in the study area clearly perceived climate change as a serious threat to yam production, particularly through soil fertility decline, water shortage, pest infestation, and irregular rainfall patterns. Sources of information on climate change were mainly through the use of personal sources of information.

Based on the identified major constraints, the study recommended that;

- i. Yam farmers' socio-economic status should be enhanced to enable them afford and adopt proven technologies that would mitigate climate change.
- ii. Extension agents who are supposed to be in close contact with the yam farmers should be trained on weather forecasts interpretation so as to disseminate the needed same information to their contact farmers.



- iii. There is also a need to subsidized irrigation facilities and provide improved drought-resistant yam varieties to reduce the burden of high costs and limited access to improved technologies.
- iv. and Government and stakeholders in agriculture should encourage and persuade farmers to diversify their crop production in order to cushion the effects of potential yam failure due to climate change.

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