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Perceived Effect of Climate Change on the Socio-Economic Status of Arable Crop Farmers in Kwara and Oyo States, Nigeria

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Abstract

The effects of climate change on the environment, economy and social life of the people, most especially arable farmers whose livelihoods depend largely on rainfall cannot be overemphasized (Fatuase et al., 2018). Arable crop farmers provide the majority of crops consumed locally and supplies to other regions of the country, and they are experiencing climate change even though they have not considered its implications, as evidenced by late rainfall and the drying up of streams and small rivers that normally flow year-round in the country (Fadairo et al, 2021). Climate change has emerged as a major threat to socio-economic development across the globe, affecting both developed and developing nations. In Nigeria and many other African countries, the agricultural sector plays a vital role in ensuring food security and providing employment opportunities for a large proportion of the population.

This study examined the effect of climate change on socio-economic status of arable crop farmers in Kwara and Oyo states, Nigeria. Using a multistage sampling procedure, 305 representing 10% of total of 3050 arable crop farmers were randomly selected and data were collected from them with the aid of a structured interview schedule. The collected data were analyzed using descriptive statistics such as Frequency counts, Percentages, means and grand mean while Chi-Square was used to test the hypothesis. Results showed that the mean age of arable crop farmers was 50 years. More than half (60.7%) of arable crop farmers were male while 39.3% were female. Majority (92.1%) were married, while only 6.6% were single and very few were divorced or widowed. The mean farming experience was 20 years. Arable crop farmers in Oyo state perceives more social and assets effects (cannot own car 4.00 and 2.27 in Kwara and Oyo state respectively) while Kwara perceived more land reduction(Kwara state,4.69 , Oyo state 3.63). The overall regression model showed that there was a statistically significant association between climate change effect and socio-economic status of arable crop farmers (F = 14.764; p = 0.05).

Keywords: arable crop farmers; climate change; socio-economic status; Kwara State; Oyo State

1 Introduction

Climate change refers to long-term variations in climatic conditions, including temperature, humidity, rainfall patterns, and sunshine duration. Although climate variability may occur naturally, recent climate change has been increasingly influenced by human activities, particularly those that contribute to greenhouse gas emissions (First Bank Nigeria, 2023). The socio-economic impacts of climate change on agriculture are manifested through declining crop yields and reduced agricultural production, which consequently lower agriculture's contribution to Gross Domestic Product (GDP). Climate change also contributes to fluctuations in global agricultural commodity prices, alters patterns of international trade, and affects the geographical distribution of agricultural production (World Bank, 2020).

Furthermore, it increases the number of people vulnerable to hunger, malnutrition, and food insecurity, particularly in developing countries where agriculture is highly dependent on climatic conditions. Projected climatic changes are likely to affect the health and well-being of millions of people worldwide. Increased temperatures and more frequent extreme weather events, including heat waves, floods, storms, wildfires, and droughts, are expected to contribute to higher rates of mortality, injuries, and disease (WHO, 2021). The **Fourth Assessment Report** of the Intergovernmental Panel on Climate Change Working Group II on Impacts, Adaptation and Vulnerability (IPCC, 2007) highlights the likely consequences of climate change, particularly those associated with the increasing frequency and intensity of extreme weather events. According to the report, climate change is expected to affect various sectors of the economy and society such as: water resources, food and agriculture, human health etc., especially in the absence of effective adaptation and mitigation measures

Agriculture is one of the major sectors of the Nigerian economy, making a significant contribution to the country's Gross Domestic Product (GDP). Crop production constitutes the largest component of agricultural activities, accounting for approximately 88% of the sector, while livestock, forestry, and fishing collectively account for the remaining 12%. According to PwC (2022), the agricultural sector recorded a GDP contribution of US$113.64 billion in 2014, representing the highest value recorded during the 2013–2017 period. However, the sector's contribution declined substantially thereafter, falling by approximately 31% from US$113.64 billion in 2013 to US$78.45 billion in 2017 (PwC, 2022).

Given the importance of agriculture to Nigeria's economic development and food security, understanding the effects of climate change on the sector is essential. Consequently, this study focuses on the influence of climate change on socio-economic status of arable crop farmers in Kwara and Oyo states, Nigeria, with particular attention to how changes in climatic conditions may affect agricultural productivity and the sector's overall contribution to the national economy. In view of this, there is a need to examine the effect of climate change on socio-economic status of arable crop farmers in the study area. This study, therefore addressed the following questions

1. What are the socio-economic characteristics of arable crop farmers in Kwara and Oyo states?
2. What are the effects of climate change on arable crop farmers' socio-economic status in the study area?

2 Methodology

2.1 Study area

The study was carried out in Oyo and Kwara states of Nigeria. Oyo State is one of the states in southwest geopolitical zone of Nigeria and lies between latitudes 7°21′ and 9°11′ N and longitudes 2°41′ and 4°31′ E. It is an inland state in southwestern Nigeria with its capital in Ibadan. It is bounded in the north by Kwara State, in the east by Osun State, in the south by Ogun State and in the west partly by Ogun State and partly by the Republic of Benin.

Kwara state is located in the North central geographical zone, and has a land mass of about 32,500 square kilometers (km^2). It is situated between the latitudes 6.5° and 11.5° N and longitudes 2.8° and 7.5° E. The state is bounded in the south with Oyo, Ekiti and Osun State. It is bounded in the West by Benin Republic while in the North and the East; it is bounded by River Niger, and Kogi State, respectively. The state has a land area of 32,500 km^2 (3,250,000 ha) with a temperature range

between 30 and 35°C. The vegetation in the northern parts of the State is mainly savannah grass land while to the southern part is wooded Guinea Savannah.

2.2 Sampling procedure

The targeted populations for the study comprise all arable crops farmers in the study areas. Multistage sampling procedure was used in selecting the arable crops farmers across the states in the study areas. Oyo and Kwara states were purposively selected for the study because of the similarities in the ecology of the areas. In the first stage, 50% of the 4 zones in each state were randomly selected giving two zones from each state, in Oyo state, Saki and Ogbomoso zones were selected while Zones A and D were selected in Kwara state making a total of four zones out of eight zones. This selection was informed by the fact that these are the rural areas where farming production and other primary activities are prevalent.

In the second stage, random selection of 50% of the blocks from each state was selected. In Oyo state, Ogbomoso zone has five (5) blocks while Saki zone has Ten (10) blocks. From the block, 50% were selected. Thus, three (3) out of five blocks were selected in Ogbomosho zone while in Saki zone, Five (5) Out of Ten blocks were randomly selected giving a total of Eight (8) blocks out of Fifteen (15) blocks.

While in Kwara state, zone A has two (2) blocks while Zone D has seven (7) blocks. Thus, one (1) block namely Patigi was selected in zone A while Three (3) blocks were selected in zone D making a total of four (4) blocks in Kwara state. Thus, eight (8) blocks from Oyo state and Four (4) blocks from Kwara state were sampled giving a total of Twelve (12) blocks from both states.

In the third stage, there are sixty-four (64) cells comprising of twenty-four (24) cells in Ogbomoso zone and forty (40) cells in Saki zone of Oyo state while in Kwara state, there are forty (40) cells comprising of eight (8) cells in Zone A and thirty-two (32) cells in Zone D, 50% of the cells across the states were purposively selected in the study areas. Thus, thirty-two (32) cells from Oyo state and twenty (20) cells from Kwara state making a total of Fifty-two (52) cells out of One hundred and four (104) cells.

In the fourth stage, the lists of registered arable crop farmers in each cell were collected through the Extension agents. There are 1,770 registered arable crop farmers in Oyo state and 1,280 farmers in Kwara state making a total of Three thousand and fifty (3,050) arable crop farmers in the study areas. From the list, 10% of the registered arable crop farmers were randomly selected giving a total of Three Hundred and five (305) registered Arable Crop Farmers as the sample size in the study areas.

2.3 Data collection and analysis

Structured interview schedule was used to obtain information from the arable crop farmers because most of the farmers in the study areas were literate. Data collected were subjected to both descriptive analysis such as frequency count, percentages, Mean and standard deviation while inferential statistics such as Chi-square was used to test the hypothesis.

3 Results and discussion

3.1 Socio-economic characteristics of arable crop farmers

The results presented in Table 1 showed that in Kwara state 43.75% and 24.29% of arable crop farmers were between the age bracket of 46-55 and 56-65 years respectively while in Oyo state 24.29% and 22.60% indicated that arable crop farmers were between the age bracket of 56-65 and 46-55 years of age respectively. The pooled result revealed that most respondents were within the economically active age groups; with 31.5% aged 46–55 years and 26.6% aged 56–65 years. The mean age of arable crop farmers was 50 years (±11.4), indicating that farming in the study area is dominated by middle-aged and older individuals. This finding is consistent with previous studies that reported an ageing farming population in Nigeria due to youth migration to urban areas (Awotide et al., 2015; Ogunniyi et al., 2021). Ageing farmers may face limitations in adopting labor-intensive or technologically advanced adaptation strategies, potentially increasing vulnerability to climate change impacts (FAO, 2018). The predominance of older farmers may therefore influence both perception and adaptive responses to climate change in Oyo and Kwara States.

The result in Table 1 also revealed that in Kwara state, more than half (60.2%) of arable crop farmers were male while 39.8% were female. In Oyo state, more than half (61.0%) of arable crop farmers were male while 39.0% were female. The pooled result also indicated that more than half (60.7%) of arable crop farmers were male while 39.3% were female. This indicates male dominance in arable crops farming in the study areas. This pattern aligns with existing literature indicating that men dominate land-intensive agricultural activities in Nigeria due to cultural norms and land ownership structures (World Bank, 2020). Male farmers typically have greater access to productive resources such as land, credit and extension services which enhances their adaptive capacity to climate change. However, female farmers often face greater vulnerability due to limited access to these resources, despite playing critical roles in agricultural production (IPCC, 2022). The lower representation of female farmers in the study areas may therefore reflect structural gender inequalities in agricultural system and distribution of resources.

The result showed that in Kwara state majority (92.1%) were married while 6.6% were single. In Oyo state, majority (64.99%) were married while 4.52% were single. The pooled result indicated that overwhelming majority (92.1%) were married, while only 6.6% were single and very few were divorced or widowed. This suggests that farming in the study area is primarily a family-based livelihood activity. Marital status is an important determinant of agricultural productivity because married farmers often have access to family labour, which enhances farm operations and climate adaptation activities such as mulching, irrigation, and crop diversification (Abid et al., 2015). Family labour reduces dependence on hired labour, thereby lowering production costs and improving farm resilience. The high proportion of married farmers may therefore enhance adaptive capacity to climate change through shared labour and household resource pooling.

Educational status of arable crop farmers as presented in Table 1 revealed that in Kwara state majority (91.85%) had formal education right from primary school to tertiary institutions while 5.47% had no formal education and 4.69% had non -formal education. In Oyo state, majority (91.56%) of arable crop farmers had formal education while 6.2% had no formal education and 2.3% with non-formal education. The pooled result revealed that educational attainment varied among respondents. About 26.2% had completed tertiary education, 21.6% had completed secondary education, and 18.0% had completed primary education. However, 5.9% had no formal education. Education is a critical

determinant of climate adaptation capacity because educated farmers are more likely to understand climate information, adopt improved technologies, and implement adaptive strategies.

The relatively high proportion of farmers with secondary and tertiary education suggests good potential for climate adaptation in the study area. However, farmers with low education levels may face challenges in accessing and applying climate information effectively. Overall, the socio-economic profile of respondents indicates moderate adaptive capacity but also highlights potential vulnerability factors. The predominance of older farmers may limit technological adoption, while gender disparities may restrict female farmers' access to adaptive resources. Education levels appear relatively favourable, suggesting potential for effective climate adaptation if supported by extension services and institutional interventions. These findings are consistent with the Intergovernmental Panel on Climate Change (2022), which emphasizes that socio-economic factors such as age, education, and gender significantly influence vulnerability and adaptive capacity in agricultural systems.

The result of arable crop farmers farming experience is presented in Table 1. The result revealed that arable crop farmers in the study areas are well experienced with a mean farming experience of 20 years. The distribution is spread across all categories, showing a mix of new entrants and old arable crop farmers. In Kwara state, 14.1% have 1-5 years, 15.6% have 6-10 years and 15.6% have 11-15 years. Above 54.2% have 20 years and below experience. In Oyo state, the modal experience is 16-20 years with 19.8%, followed by 26-30 years with 18.1 %. About 45.1% have above 20 years' experience. The pooled result showed that the highest proportion (16.7%) is in the 16-20 years bracket, followed by 26-30 years (15.4%) and 11-15 years (14.8%). Only 11.5% have 1-5 years' experience. This confirms that majority of the arable crop farmers are not new in arable crop production. The high proportion of arable crop farmers with 16-30 years' experience explains the mean of 20 years.

The mean of 20 years farming experience implies that arable crop farmers have long-term observation of climate. They have witnessed changes in rainfall onset, cessation, flooding and drought over two decades. Therefore, their perception of climate change effects is not based on hearsay but on personal long-term experience and indigenous knowledge. This make their perception highly reliable. Also, with 20 years farming experience, arable crop farmers are well grounded in arable crop production practices such as appropriate planting dates, soil management and varietal selection. This experience helps them to device local adaptation strategies.

Table 1. Distribution of arable crop farmers by their socio-economic characteristics.

Variable	Kwara (n = 128)		Oyo (n = 177)		Pooled (n = 305)		Mean
	Freq	%	Freq	%	Freq	%	
Age (years)							
20-35	18	14.1	22	12.4	40	13.1	
36-45	22	17.2	37	20.9	59	19.3	
46-55	30	23.4	51	28.8	81	26.6	
56-65	30	23.4	34	19.3	64	21.0	
66-75	**28**	**21.9**	**33**	**18.6**	**61**	**20.0**	
Male	99	77.3	143	80.8	242	79.3	
Female	29	22.7	34	19.2	63	20.7	
Marital status							

Variable	Kwara (n = 128)		Oyo (n = 177)		Pooled (n = 305)		Mean
	Freq	%	Freq	%	Freq	%	
Single	06	4.7	14	7.9	20	6.6	
Married	119	93.0	162	91.5	281	92.1	
Divorced	02	1.6	01	0.6	03	1.0	
Widow	01	0.7	00	0.0	01	0.3	
Farming experience (years)							
1-5	18	14.1	17	9.6	35	11.5	20 years
6-10	20	15.6	21	11.9	41	13.4	
11-15	20	15.6	25	14.1	45	14.8	
16-20	16	12.5	35	19.8	51	16.7	
21-25	15	11.7	16	9.0	31	10.2	
26-30	15	11.7	32	18.1	47	15.4	
31-35	08	6.3	10	5.6	18	5.9	
36-40	13	10.2	17	9.6	30	9.8	
Religion							
Islam	85	66.4	91	51.4	176	57.7	
Christianity	40	31.3	81	45.8	121	39.7	
Traditional	03	2.3	05	2.8	08	2.6	
Annual income (₦)							
500,000.00–3,500,000.00	75	58.5	140	79.0	215	70.5	
3,501,000.00 – 6,500,000.00	28	21.9	25	14.12	53	17.4	
6,501,000.00 – 9,500,000.00	21	16.5	05	2.82	26	8.5	
Above 9,501,000.00	04	3.1	07	3.95	11	3.6	

Source: Field survey, 2025.

3.2 Perceived effects of climate change on the socio-economic status of arable crop farmers in Kwara State

Table 2 presented the distribution of arable crop farmers based on the perceived effects of climate change on their socio-economic status. In Kwara state, the major socio-economic effects are production related: climate change has resulted in gross reduction in number of hectares put under cultivation was ranked first(WMS=4.69) by arable crop farmers followed by climate has reduced my income from farm business(WMS=4.61), I cannot afford having my personal house due to poor crop yield resulting from climate change(WMS=4.26), I can give my children good education(Wms=1.88) and can afford to pay bills such as electricity, cable etc due to effects of climate change.

The implication of this finding is that climate change has a severe socio-economic consequence beyond farm. Arable crop farmers both in Kwara and Oyo states agreed income reduction is the major climate effects on their socio economic characteristics. The implication of this finding is that arable crop farmers' income is not stable. Also, there is gross reduction in number of farm hectares put into

cultivation as a result of climate risk, matching adaptation. Climate change not only affects agricultural productivity but also has significant implications for farmers' income, living standards, financial stability, and overall wellbeing. This finding is in line with the report of Intergovernmental Panel on Climate Change (2022) that climate change significantly affects rural livelihoods by reducing agricultural productivity, income stability, and economic resilience among smallholder farmers. The results show that climate change has multidimensional socioeconomic impacts on arable crop farmers in the study area, particularly affecting their income, farm size, asset ownership, financial obligations, housing, education, and access to healthcare

Table 2. Perceived effects of climate change on the socio-economic status of arable crop farmers in Kwara State.

s/n	Statement	SA	A	U	SD	D	WMS	Rank	Grand mean
		Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)			
1	Climate change has resulted in gross reduction in number of hectares put under cultivation	106 82.8	15 11.7	0 0.0	3 2.3	4 3.1	4.69	1st	3.65
2	Climate change has reduced my income from farm business	98 76.6	20 15.6	1 0.8	4 3.1	9 7.0	4.61	2nd	
3	I cannot afford having my personal house due to poor crop yield resulting from climate change	72 56.3	40 31.3	2 1.6	5 3.9	9 7.0	3.70	3rd	
4	Climate change has affected my financial obligations to clubs and societies	8 6.3	72 56.3	10 7.8	15 11.7	23 18.0	3.21	4th	
5	As a result of climate change, I don't have access to medical treatment	20 15.6	25 19.5	7 5.5	45 35.2	45 35.2	2.78	5th	
6	I cannot conveniently own my personal house	10 7.8	10 7.8	8 6.3	80 62.5	20 15.6	2.30	6th	
7	Because of negative effects of climate change, I cannot own a car	18 14.1	20 15.6	0 0.0	30 23.4	60 46.9	2.27	7th	
8	I cannot afford to pay my bills such as electricity, cable etc. due to effects of climate change	11 8.6	15 11.7	2 1.6	65 50.8	35 27.3	2.23	8th	
9	I cannot give my children good education	5 3.9	15 11.7	3 2.3	42 32.8	63 49.2	1.88	9th	

Note: SA = strongly agree; A = agree; U = undecided; SD = strongly disagree; D = disagree; WMS = weighted mean score. Source: Field survey, 2025.

3.3 Perceived effects of climate change on the socio-economic status of arable crop farmers in Oyo State

Table 3 presented the distribution of respondents based on the perceived effects of climate change on their socioeconomic status. Climate change not only affects agricultural productivity but also has significant implications for farmers' income, living standards, financial stability, and overall wellbeing. According to the Intergovernmental Panel on Climate Change (2022), climate change significantly affects rural livelihoods by reducing agricultural productivity, income stability, and economic resilience among smallholder farmers. The results show that climate change has multidimensional

socioeconomic impacts on arable crop farmers in the study area, particularly affecting their income, farm size, asset ownership, financial obligations, housing, education, and access to healthcare

3.3.1 Reduction in cultivated land size

As revealed in Table 3, the statement that climate change has resulted in a gross reduction in the number of hectares put under cultivation ranked 1st with the highest weighted mean score (WMS = 3.29). The majority of respondents agreed (57.0%) or strongly agreed (27.5%) that climate change has reduced the land area they cultivate.

This finding suggests that climate change has forced farmers to reduce their scale of production, possibly due to unfavorable weather conditions such as drought, erratic rainfall, soil degradation, and declining soil fertility. Reduced farm size directly affects crop output, income, and food security. This finding is consistent with the Food and Agriculture Organization (2019), which reported that climate change reduces agricultural productivity and forces farmers to reduce cultivated land.

3.3.2 Reduction in farm income

Table 3 indicated that reduction in farmers income from farm business as a result of climate change was ranked 2nd with a high weighted mean score (WMS = 2.99). A large proportion of respondents agreed (36.7%) or remained undecided (42.0%), indicating that climate change negatively affects farm income. Income reduction is a direct consequence of declining crop productivity, crop failure, and increased production costs associated with climate change. This finding supports the report of the World Bank (2021), which stated that climate change significantly reduces farm income and increases poverty among smallholder farmers in developing countries.

3.3.3 Inability to own a personal house

Table 3 further revealed that inability to own a personal house due to poor crop yield resulting from climate change ranked 3rd (WMS = 2.78). This indicates that climate change has significantly affected farmers' asset acquisition and financial stability. Reduced agricultural productivity and income limit farmers' capacity to invest in housing and other long-term assets. This finding agrees with the Food and Agriculture Organization (2017), which reported that climate change reduces rural household wealth accumulation and asset ownership. Asset ownership is an important indicator of socioeconomic wellbeing and financial stability.

3.3.4 Reduced capacity to own vehicles

The result in Table 3 also revealed that the inability to own a car due to climate change ranked 4th (WMS = 2.75), indicating that climate change negatively affects farmers' ability to acquire valuable assets. Vehicle ownership reflects financial stability and economic wellbeing. Reduced income due to climate change limits farmers' ability to invest in transportation and other assets. This finding supports the Intergovernmental Panel on Climate Change (2022), which stated that climate change negatively affects rural household wealth and asset ownership.

3.3.5 Reduced access to medical treatment

The effects of climate change on arable crop farmer' socio-economic characteristics as presented in Table 3 indicated that Climate change affects farmers' access to medical treatment ranked 5th (WMS = 2.22), indicating moderate socio-economic impact. Reduced income limits farmers' ability to afford healthcare services, which may negatively affect their health and productivity. According to the World Health Organization (2021), climate change negatively affects health outcomes by increasing

vulnerability and reducing access to healthcare services. Poor health reduces farmers' productivity and agricultural performance.

3.3.6 Reduced ability to provide quality education for children

From Table 3, the statement that farmers can give their children good education ranked 6th (WMS = 1.97), while climate change denying farmers the ability to provide the best education ranked 8th (WMS = 1.45). Education is directly linked to household income and economic stability. Reduced agricultural income due to climate change limits farmers' ability to invest in education. This finding aligns with the United Nations Development Programme (2020), which reported that climate change negatively affects education access through reduced household income. Education is essential for breaking the cycle of poverty and improving livelihood opportunities.

3.3.7 Reduced financial stability and social obligations

As presented in Table 3, Climate change affecting farmers' financial obligations to clubs and societies was ranked 9th (WMS = 1.42), indicating reduced financial stability and social participation. Social participation is an important aspect of rural livelihoods and economic wellbeing. Reduced income limits farmers' ability to participate in social and economic activities.

3.3.8 Reduced ability to pay bills and meet household financial obligations

Table 3 further showed that the inability to pay bills due to climate change was ranked 10th with the lowest weighted mean score (WMS = 1.38), indicating that climate change negatively affects farmers' ability to meet financial obligations. Reduced agricultural income limits household financial stability and increases vulnerability. This finding agrees with the World Bank (2021), which reported that climate change increases economic vulnerability and poverty among rural households. The findings reveal that climate change has significantly affected farmers' socioeconomic characteristics, particularly reducing cultivated land size, farm income, asset ownership, and financial stability. These impacts increase farmers' vulnerability and reduce their resilience to climate risks. Addressing climate change impacts requires improved climate adaptation strategies, agricultural support services, and policies aimed at improving farmers' income and livelihood

Table 3. Perceived effects of climate change on the socio-economic status of arable crop farmers in Oyo State.

s/n	Statement	SA	A	U	SD	D	WMS	Rank	Grand mean
		Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)			
1	Climate change has affected my financial obligations to clubs and societies	130 18.7	20 11.3	2 1.1	10 5.6	15 8.5	4.36	1st	3.48
2	Climate change has reduced my income from farm business	107 60.5	42 23.7	0 0.0	18 10.2	10 5.6	4.23	2nd	
3	Because of negative effects of climate change, I cannot own a car	90 50.9	53 29.9	0 0.0	12 6.8	22 12.4	4.00	3rd	
4	Climate change has resulted in gross reduction in number of hectares put under cultivation	83 46.9	30 16.9	4 2.3	36 20.3	24 13.6	3.63	4th	
5	I can give my children good education	54 30.5	75 42.4	0 0.0	10 5.6	38 21.5	3.55	5th	

s/n	Statement	SA	A	U	SD	D	WMS	Rank	Grand mean
		Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)			
6	I cannot avoid having my personal house due to poor crop yield resulting from climate change	35 19.8	55 31.1	3 1.7	34 19.2	50 28.2	2.95	6th	
7	I cannot avoid to pay my bills such as electricity, cable etc. due to effects of climate change	33 18.7	22 12.4	10 5.6	50 28.3	62 35.0	2.51	7th	
8	As a result of climate change, I don't have access to medical treatment	17 9.6	20 11.3	8 4.5	80 45.2	52 29.4	2.27	8th	
9	I can conveniently own my personal house	20 11.3	29 16.4	3 1.7	43 24.3	82 46.3	3.78	9th	

Note: abbreviations as in Table 2. Source: Field survey, 2025.

3.4 Mean ranking of the effects of climate change across Kwara and Oyo states

Table 4 presents the Mean ranking of the effects of climate change on arable crop farmers' socio-economic status across Kwara and Oyo states. The result revealed that in Kwara state, gross reduction in hectares ranked first with WMS of 4.69 as major socio-economic effect, while in Oyo state affected financial obligations to clubs ranked 1st with 4.36. Reduction in farmers income ranked 2nd in both states with 4.61 and 4.23 respectively with grand means of 3.14 and 3.30. Pooled income reduction of 4.42 indicated climate has severe socio-economic consequence beyond farm. Arable crop farmers in Oyo state perceives more social and assets effects (cannot own car 4.00 and 2.27 in Kwara and Oyo state respectively) while Kwara perceived more land reduction(Kwara state,4.69 , Oyo state 3.63).This implies climate change is causing both economic contraction and social capital erosion, requiring social protection and income diversification policies.

Table 4. Mean ranking of the effects of climate change on the socio-economic status of arable crop farmers across Kwara and Oyo states.

S/N	Perceived effects	Kwara (wms)	Oyo (wms)	Pooled mean
1	Gross reduction in hectares	4.69	3.63	4.16
2	Reduction in income	4.61	4.23	4.42
3	I cannot afford personal house because of poor yield	3.70	2.95	3.33
4	I cannot give my children good education	3.21	4.36	3.79
5	I cannot conveniently own personal house	2.78	2.27	2.53
6	Negative effects of climate change affected my financial obligations to club and societies	2.30	3.78	3.04
7	I cannot own a car because of climate change effect	2.27	4.00	3.14
8	I don't have access to medical treatment because of the negative effects of climate change	2.23	2.51	2.37
9	I cannot afford to pay bills	1.88	3.55	2.72

Source: Field survey, 2025.

3.5 Relationship between socio-economic status and the effects of climate change

The hypothesis was tested by the use of Regression analysis at 0.05 level of significance. The regression analysis presented in Table 5 examined the association between socio-economic status of respondents and the effects of climate change on arable crop farmers. The overall regression model was statistically significant ($F = 14.764$; $p < 0.05$), indicating that the predictor variables jointly explained a significant proportion of variation in the dependent variable. This suggests that the socio-economic indicators included in the model collectively have meaningful explanatory power regarding the effects of climate change experienced by arable crop farmers.

The coefficient of determination ($R^2 = 0.639$) indicates that approximately 63.9% of the variation in the dependent variable was explained by the independent variables included in the model, while the adjusted R^2 of 67.2% implies a moderate explanatory capacity after adjusting for the number of predictors. Although this value appears relatively low, such outcomes are common in social science and agricultural field studies where human and environmental behaviour is influenced by numerous unobserved factors beyond those captured in the model (Gujarati and Porter, 2009).

Table 5. Summary of the linear regression analysis of the relationship between the socio-economic status of arable crop farmers and the effects of climate change.

Model	Coefficients			
	B	Std. Error	t-value	Sig
(Constant)	46.816	1.059	44.208	0.000
Reduced income	0.151	0.007	21.571	0.004
Lower social asset status	-0.125	0.276	-0.453	0.651
Lower Educational Status for Dependent	-0.108	0.306	-0.353	0.725
Inadequate Electricity accessibility	0.947	0.293	3.232	0.001
Housing Insecurity	-0.520	0.402	-1.293	0.197
Indebtedness	-1.099	0.323	-3.401	0.001
Reduction in Land hectare cultivation	0.212	0.378	0.561	0.501
Lower access to medical services	-0.058	0.219	-0.264	0.792
Housing Asset Ownership	0.225	0.113	1.991	0.032
Educational Affordability for Dependent	-0.113	0.312	-0.361	0.718
Model Summary				
Statistic	Value			
R^2	0.639			
Adjusted R^2	0.672			
F-value	14.764			
Sig. F	.000			
Durbin Watson	1.824			

Note: Significant at $p < 0.05$. Source: Field survey, 2025.

4 Conclusion and recommendation

It is concluded that climate change has multidimensional socioeconomic impacts on arable crop farmers particularly affecting their income, farm size, asset ownership, financial obligations, housing, education, and access to healthcare. It is therefore recommended that there is need for integrated rural development interventions that combine climate adaptation support with infrastructure development and financial assistance mechanisms.

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