Technoscience Journal for Community Development in Africa 5:1 (2026) 91–99
ISSN 2659-0573

Research Article

Factors influencing choice of climate smart agricultural practices (CSAPs) among small scale maize farmers in Oyo state, Nigeria

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Abstract: Human activities have contributed to the depletion of ozone layer. This has intensified the greenhouse effect and accelerate global warming. This study examined the effect of climate smart agricultural practices (CSAPs) on the yield and income of maize farmers in Oyo State, Nigeria. Multistage sampling procedure was used to select 120 respondents for the study. The data collected was cross-sectional using structured questionnaires, focus group discussion (FGD) and key informant interview (KII). The study examined the socioeconomic characteristics of farmers, factors influencing the choice of CSAPs, determinants of adoption and constraints to their use. Data were analyzed using descriptive statistics, logistic regression and likert rating scale. The findings revealed that most respondents were male (75.8%), household size (7), age (37.6 years) and experience (12.3 years). Logistic results confirmed model fitness with a likelihood ratio (17.71; $p<0.01$) and log-likelihood (-93.6465). In addition, choice of CSAPs was influenced by farm size (0.0235; $p<0.01$), access to credit (0.0096; $p<0.05$), cultivation method (0.0132; $p<0.01$), seasonal income (0.0107; $p<0.01$) and agriculture-led training (0.0043; $p<0.05$). CSAPs strategies and constraints to the choice of CSAPs were crop rotation and high illiteracy level respectively. The study recommends affordable credit, extension services and farm inputs to enhance CSAP adoption.

Keywords: climate smart agricultural practices, maize farmers, crop rotation, illiteracy level

1. Introduction

Agriculture plays a vital role in the fight against extreme poverty and famine. It is the main source of income for approximately 1.6 billion rural smallholder farmers (Ahmadzai et al., 2021). Seed Builders (2024) submitted that agriculture contributes about 26% to the Nigeria's nominal Gross Domestic Product (GDP) annually, in 2023 of which agricultural sector accounted for 24.01% of the GDP. One environmental component that has a significant impact on agricultural outputs is climate and it significantly affects both the kinds and varieties of crops that can be cultivated and the duration of the growing season for all the crops that are cultivated (Adebayo & Ojogu, 2019). Agricultural sector remains vulnerable to climate variability; hence, it affects small-scale farmers due to their level of poverty, over reliance on natural resources and their inability to adopt new livelihood strategies (Tofu et al*.,* 2022). The small holder farmers mostly reside and carry out almost all their activities in the rural communities in Nigeria, and rely heavily on agriculture that serves as a mainstay of the Nigerian economy.

According to Olaniyan (2015), maize is described as the most preferred among the arable crops that are widely cultivated by the small-scale farmers in Nigeria. He expressed further that in the developing nations, maize cultivation had immensely contributed to the mitigation of the prevailing food insecurity and poverty alleviation, most especially in the rural areas. Maize is a common food that is consumed by most households in different forms. The reduction in maize production in sub-Saharan Africa will invariably leads to famine and starvation. It is projected that by 2050, the demand for maize in developing nations will increase due to intensity of use as human and livestock feed. Therefore, it calls for proactive strategies to increase maize production in order to meet-up with the demand for maize.

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The rapid growth of global population requires more than 70% food production by 2050 than is currently available, in order to reduce the exacerbated challenges of hunger traceable to insufficient land and water availability, incessant climate change effect and declining soil fertility (Alfred et al., 2021). Farmers' decision to adopt climate smart agriculture strategies to boost maize production is eminent based on the reason that it has multiplier effects on farmers' income and productivity. It is estimated that there is about 33% wastage in agricultural production due to poor logistics and storage which clearly has a nexus with adverse climatic outcome (Sharala & Chart, 2025). The coping strategies to end food insecurity and climate change is to implement Smart farming which is simply the application of information and data technologies for optimizing complex farming systems (Ndamani & Watanabe, 2016). Climate-smart agricultural practices (CSAPs) have emerged as a transformative approach designed to increase agricultural productivity, enhancing resilience to climate shocks and reduce greenhouse gas emissions where possible (FAO, 2013). CSAPs include efficient water management, improved crop varieties, integrated pest management, and soil conservation techniques, among others. The successful adoption of these practices is critical to safeguarding the future of farming in a changing climate.

This research seeks to investigate the effects of CSAPs among maize farmers. It aims to examine the factors influencing the choice and application of CSAPs on maize farm by the farmers. The findings will contribute to the growing body of knowledge necessary for integrating technology into climate resilience strategies in agriculture. Numerous studies by Awe et al. (2018), Williams (2024) and Oparaojiaku et al. (2025) had been carried out in the area of climate change but only a few works were done on CSAPs of which the study aims to fill the gap. The uniqueness of this study lies in its comparative nature that reflects in differentiating between the CSAPs user farmers and their non-user counterparts. Also, the study identified the factors influencing the adoption of CSAPs for effective policy recommendations. The specific objectives of the study are to: (i) describe the socioeconomic characteristics of the respondents; (ii) identify factors influencing the choice of CSAPs by the maize farmers; (iii) assess the CSAPs strategies used by the maize farmers and (iv) examine the constraints confronting choice of CSAPs among the maize farmers in the study area.

2. Methodology

2.1. Study Area

The study was carried out in Oyo State Nigeria. It is bordered in the North by Kwara State, in the East by Osun State, in the South by Ogun State and bordered in the West by the Republic of Benin. Oyo state is situated between latitude 6.5º and 9º North of the equator and between longitudes 3º East of Greenwich Meridian (Mijinyawa et al*.,* 2007). The population of Oyo State is about six million while the total land area is approximately 28,000 square kilometres (National Population Commision-2006; Oyo State Diary, 2023). The area stretches across the rainforest, guinea savanna

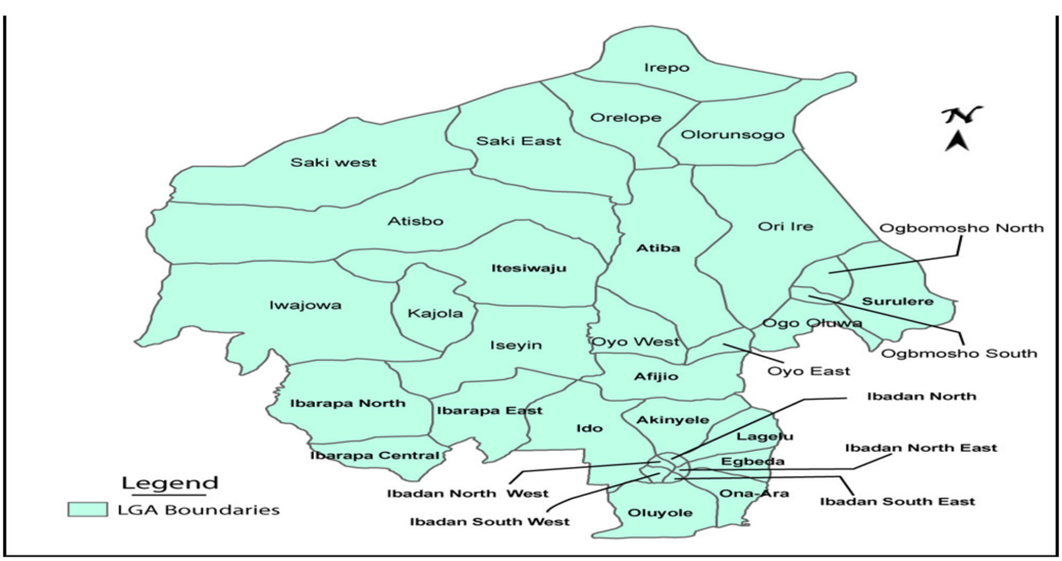

Fig. 1: Map of Oyo State, Nigeria.

Source: Ministry of Information and Culture, Oyo State

Table 1: Sampling details of maize farmers in the study area

State	ADP Zone	Block	Cell	Community	Respondents	
					User	Non-User
Oyo	Ibadan/Ibarapa	Egbeda	Erunmu	Owo-Baale	15	15
			Awaye	Awaye	15	15
			Osengere	Osengere	15	15
			Egbeda	Egbeda	15	15
Sub-total					60	60
Total					users + non-users=120	

Source: Field Survey, 2025.

and derived savanna agro-ecologies. Rainfall in the area is bimodal, enhancing the annual average rainfall of 1350 mm and the mean annual temperature of ±27^{0}C (Oyo State Diary, 2023). The government of the State in the zone established the Agricultural Development Zone (ADP) which comprises four zones including Oyo zone, Ibadan/ Ibarapa zone, Ogbomoso zone and Saki zone, with activities being coordinated and monitored by the Agricultural Extension agents. Operations in the ADP zones are dis-aggregated into Extension Department, Fisheries Department, Project Planning and Evaluation Department and Women-in-Agriculture Department among others. The notable arable crops cultivated in the State are cassava, yam, maize, melon, cowpea and the likes.

2.2. *Source of Data and Instrument of Data Collection*

Primary data was used for the study and the instruments of data collection were well-structured and pre-tested copies of questionnaire, key informant interview (KII) and focused group discussion (FGD). Some relevant data collected were on age, sex, household size, marital status, farming experience, access to credit and the various CSAPs adopted by the respondents to combat climate effects maize and the management methods used by the respondents among others. The data used was collected in June 2024 when rainfall was regular and steady.

2.3. *Sampling Technique*

A multistage sampling procedure was used in the selection of the respondents used for the study. The first stage involved the purposive selection of Ibadan/Ibarapa zone, under the Agricultural Development Programme (ADP) operation, due to high concentration of maize farmers in the zones. In the second stage, Egbeda block was randomly selected while the random selection of four cells, namely: Erunmu, Awaye, Osengere and Egbeda formed the third stage. In the fourth stage was the random selection of a community from each of the cells, these are: Erunmu cell (Owo Baale), Awaye (Awaye), Osengere (Osengere) and Egbeda (Egbeda). From each of the communities was the random selection of 30 respondents comprising 15 users of CSAPs and 15 non users due to the relative parity in the population forming the fifth sampling stage. A total of 120 respondents were selected from the study area for the final analysis. Table 1 explicitly presents the sampling details.

2.4. *Analytical Tools*

Descriptive Statistics was employed to describe the socioeconomic characteristics of the respondents. This included frequent counts, percentages and mean. Logit Regression was used to identify factors influencing the choice of CSAPs among the maize farmers in the study area. Logit models the log-odds of a binary outcome as a linear function of the predictor variables (Damodar et al., 2004). It's expressed as:

$$\text{Logit}(P) = \ln(P / (1 - P)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_k X_k, \quad 1$$

where P is the probability of the outcome, and X_1, X_2, ... X_k are the predictor variables with corresponding coefficients β_0, β_1, ... β_k. Where:

Logit (P): This represents the log odd or logit, of the probability (P) of the event occurring. It's calculated as the natural logarithm of the odds

$$(P / (1 - P)) \quad 2$$

β_0: This is the intercept term, representing the log-odds when all predictor variables are zero.

β_1, β_2, ... β_k: These are the regression coefficient each associated with a specific predictor variable (X_1, X_2, ... X_k).

X_1, X_2, ... X_k: These are the predictor variables, which can be continuous or categorical.

ln: This denotes the natural logarithm (base e).

P= Choice of CSAPs (Yes=1; No=0)

X_1 = Farm size (in hectare)

X_2 = Cropping System (Mixed Cropping=1; Otherwise =0)

X_3 = Sex (Male=1; Female=0)

X_4 = Age (in years)
X_5=Access to Credit (Yes=1; No=0)
X_6 = Extension Contact (Yes=1; No=0)
X_7 = Education (in years)
X_8 = Cooperative Membership (Yes=1; No=0)
X_9 = Cultivation Method (Traditional=1; Modern=0)
X_{10} = Household Size (in No.)
X_{11} = Seasonal Income (in Naira)
X_{12} =Primary Occupation (Farming=1; Otherwise=0)
X_{13} = Agriculture-Related Training (Yes=1; No=0)

The five-points Likert Scale Rating (LSR) was used to assess the climate-smart strategies adopted by maize farmers to counter the effect of climate change on maize production. These are defined as: 5= Strongly Effective (SE), 4 = Effective (E), 3 = Undecided (U), 2 = Ineffective (I), 1 = Strongly Ineffective (SI). The scores were then calculated as follows:

i. Weighed Score (WS) = 5n + 4n + 3n + 2n + 1n = Total Score for each strategy where n = Frequency of each strategy for each rating
ii. Weighted Mean Score (WMS) =

$$\frac{\textit{Total Score of Each Strategies}}{\textit{Total Number of Respondents}}$$

3. Results and discussion

3.1. Socio-economic characteristics of the respondents

The result showed that the male (75.8%) outnumbered their female (24.2%) counterparts by a margin of 51.8%. The result suggests that males are more endowed with the required strength and have the productive resources to carry out the arduous task of maize production under the climate smart technology (Table 2). This result is in tandem with the findings of Bashiru et al*.,* (2024) who established that climate smart technology has more male adopters than their female counterparts. The level of education of the maize farmers revealed that the majority (67.5%) of the maize farmers acquired secondary school education while other various groups of educational level had less than 15%. It could be inferred from this result that maize farmers in the area utilized the advantage of the post-primary school education made available to them by the state government through building of secondary schools in every nook and cranny of the state to ease and improve literacy. This probably assisted to a greater extent in the adoption and implementation of CSAPs on their maize farms. This result aligns with the findings of Abonesh et al., (2023) who indicated that education enhances adoption of innovation among the farmers most especially the practices relating to the production aspect of farming. The result on the household size of the respondents revealed an average of seven household members while the highest and lowest groups were 68% and less than 10% respectively. The result suggests that households of farmers is sizeable and could serve as a source of family labour. The age of maize farmers clustered around less than 40 years while the average age stood at about 38 years. It indicates that the maize farmers are still in their productive age in the study area. Farming experience as presented in Table 2 also showed that the highest (55.8%) of the farmers were within the age bracket of 11-20 years while the average experience was 12.3 years. It could be inferred from this result that the years of experience is considerable enough for a maize farmer to carry out farm managerial activities, most especially, in managing climatic interference efficiently, *ceteris paribus.* This result aligns with the findings of Adebayo & Ojogu (2019) who in their study affirmed that experience counts significantly in the use of climate smart adoption practices among the small farmers. About 66% of the farmers had access to extension contacts according to the result in Table 2. This reveals that more than half of the population of maize farmers have access to technical advice, timely information and skill-improving training. Source of credit acquired by the respondents revealed that farmers (58.3%) patronized cooperative societies for their financial needs in the form of credit. This indicates that the source is reliable and capable of granting the needed amount of credit as at when needed because of the time-bound nature of farm activities. This outcome is confirmed by Awe et al., (2018) who affirmed that access to credit encourages farmers to adopt new innovation most especially the ones that can help to withstand the vagaries of weather, and in turn, realize a bumper harvest.

3.2. Determinants of choice of CSAPs by the maize farmers

The likelihood ratio (17.41) was found to be significant at 1% and the log likelihood ratio (-93.6465) suggests the appropriateness and fitness of the model (Table 3). From all the variables modeled; farm size, access to credit, years of education, cultivation method, household size, seasonal income and agricultural related training were found to possess signs of interest and found to be significant at various conventional levels of 1% and 5% respectively. Farm size increased the number of maize farmers that chose to practice CSAPs in the production

Table 2: Socio-economic characteristics of the respondents

Variables	Frequency	Percent	Mean
Sex			
Male	91	75.8	
Female	29	24.2	
Level of Education			
No formal education	10	8.3	
Primary Education	17	14.2	
Secondary Education	81	67.5	
Tertiary Education	12	10.0	
Household Size (in No.)			
≤5	32	26.7	7 members
6-10	82	68.3	
>10	6	5.0	
Age (in years)			
≤40	73	60.8	
41-50	17	14.2	37.6 years
51-60	11	9.2	
>60	19	15.8	
Farming experience (in years)			
≤10	29	24.2	
11-20	67	55.8	12.3 years
21-30	23	19.2	
>30	1	0.8	
Extension service (access)			
Yes	41	34.2	
No	79	65.8	
Sources of Credit			
Relatives and Friends		10	
Money Lender		9.2	
Personal Savings		16.7	
Co-operatives societies		58.3	
Government		5.8	
Total		120	100.0

Source: Field Data, 2025.

season as there was a direct relationship between them. Access to credit also increase the choice of the maize farmers that chose to use CSAPs and relationship is direct. Years of education reduces the choice of CSAPs among the maize farmers with inverse relationship and negatively related. The use of traditional cultivation method also has a positive relation on the use of CSAPs by the maize farmers and the relationship was found to be direct. Seasonal income influenced the use of CSAPs positively among the maize farmers as it increases its use. Agriculture-related training among the maize farmers negatively influenced the choice of CSAPs among the maize farmers.

The result of the marginal effect revealed that a unit increase in farm size leads to 0.0235 unit increase in the probability of using the CSAPs by the maize farmers. The result suggests that farmers owning or cultivating large farm land are encouraged to use CSAPs in order to give maximum protection to their crop against unforeseeable risks that can jeopardize the future of their entire investment. This result is in tandem with the findings of Obeta (2014) who submitted that large expanse of farmlands vis-a-vis increases the viability of crop productions encourages the adoption of CSAPs mostly among the small-holder farmers

Access to credit was also found to influence the probability of using CSAPs by the farmers with 0.0096 units. It could be inferred from this result that when the farmers are financially buoyant, the use of any method of improving the crop environment attracts additional expenses which pays off in the long run, in terms of increased yield. This outcome agrees with Awe et al., (2018) who expressed that access to credit assists farmers in meeting up with the expenses that the use of CSAPs requires. Among the areas of these are the purchase of crop varieties, use of appropriate irrigation facilities and the quantity labour that can help in withstanding the vagaries of weather. A unit increase in the years of education leads to 0.0169 unit decrease in the probability of using CSAPs by the maize farmers. The result suggests that maize farmers may decide to jettison the practice probably due to their having an alternative to improving the crop environment against the vagaries of whether through information from the internet, journal and other resource sources. This agrees with the work of Ndamani & Watanabe (2016) that education plays a significant role in farmers' choice of CSAPs with higher levels of education are more likely to use improved technologies in order to adapt to climate change. The use of traditional cultivation method leads to the increase in probability of use of CSAPs by the maize farmers with 0.0132 units. The majority of small farmers use traditional method of cultivation due to the sizable farmland they possess as the use of various CSAPs will be easier and avert crop losses. A unit increase in the household size of the maize farmers leads to 0.2697 unit decrease in the use of CSAPs by the maize farmers. This result indicates that farmers with large household size are always reluctant to embrace the use of CSAPs probably because of the belief that the hired labour substituting status will always cater for the entire timely management of the farm. The result corroborates the studies of Ndamani & Watanabe (2016) that the visible tendency of larger households to adopt the CSAPs in order to adapt favourably to climate change is probably due to their higher endowment of labour.

Seasonal income was found to increase the probability of using CSAPs among the maize farmers by the probability of 0.0042 unit. It could be inferred from this result that with good income from the previous season, maize farmers will be able to afford the sufficient amount of money to be expended on the application of CSAPs as innovation requires more money. This result is in consonance with the findings of Ndamani & Watanabe (2016) that showed that wealthier farmers are more likely to use adaptation practices in response to climate change than poor farmers.

Attending agriculture-related training leads to 0.0043-unit probability increase in the use of CSAPs by the maize farmers. It could be inferred from this result that the maize farmers who had acquired skills from agricultural training have the propensity to be favourably disposed to the use of CSAPs to improve and protect their maize farm.

3.3. Various climate smart agricultural practices chosen by the maize farmers

The portfolio of the practices contains seven practices that are ranked from one to seven according to their relative effectiveness and work-ability (Table 4). Among all, crop rotation ranked first with a mean weight of 4.40. The result indicates that farmers rearrange their crops among the available farm plots they currently own in order to replenish the lost nutrient and prevent the farmland from becoming completely marginal and impossible to reclaim. This result agrees with Oparaojiakwu et al., (2025) that submitted that

Table 3: Logit estimate of determinants of choice of CSAPs by the maize farmers

Variable	Coefficient	Z	Prob/Z/	dy/dx	Prob/Z/
Constant	1.5356	1.43	0.15	-	-
Farm size (in hectare)	0.0603***	3.40	0.00	0.0235***	0.00
Crop. Syst. (Mixed farm=1; otherwise=0)	-0.0018	-0.98	0.33	-0.0001	0.13
Sex (M=1; F=0)	0.0071	0.71	0.46	0.0028	0.76
Age (in years)	-0.1075	-0.47	0.64	-0.0420	0.59
Access to Credit (Yes=1; No=0)	0.0247***	3.67	0.00	0.0096***	0.00
Extension Contact (Yes=1; No=0)	-0.2877	-1.19	0.23	-0.0152	0.25
Education (in years)	-0.0432**	-2.93	0.05	-0.0169**	0.07
Cooperative Membership (Yes=1; No=0)	0.0206	0.07	0.95	0.0081	0.52
Cultivation Method (Traditional=1; Modern=0)	0.1321***	3.86	0.00	0.0132***	0.00
Household Size (in No.)	-0.7252***	-2.97	0.00	-0.2697***	0.00
Seasonal Income (in Naira)	0.0107***	3.17	0.00	0.0042***	0.00
Primary Occupation (Farming=1; Otherwise=0)	-0.0082	-0.03	0.97	-0.0032	0.94
Agric-Related Training (Yes=1; No=0)	0.0110**	2.08	0.04	0.0043**	0.07
Number of Observations	160				
LRchi2(10)	17.71***				
Prob>chi2	0.0000				
Pseudo R^2	0.00851				
Loglikelihood	-93.6465				

Source: Field Survey, 2025.

crop rotation among the array of farm practices brings about a significant change in the farm environment for the purpose of checking the climate change effect. Minimum tillage is ranked second (4.30) and used by the maize farmers probably to prevent the farmland from being totally exposed to the harsh and vagaries of weather such as erosion, evaporation and surface run-off. The result is in agreement with the findings of Izuogu et al., (2023) who supported the use of minimum tillage as a veritable means of shielding the soil surface from the excessive contact with the weather elements that are destructive to the soil nutrient, and in turn, reduction in crop yield. Inter-cropping was ranked fourth (4.20) as one of the CSAPs practices used by the maize farmers. Varieties of crops are cultivated per unit season in order to serve as blanket covering of the farmland from direct climatic element interaction such as rainfall, sunshine, temperature etc. and the benefit of fixing the lost macro and micro nutrients in the soil for maximum crop yield. The fifth CSAP listed was Organic manure application (4.13) which is primarily used for the replenishment of lost nutrients and the improvement of soil structure to avert leaching and water retention. This outcome is in tandem with the study of Mbanasor et al. (2024) who submitted that the application of the fertilizer that is organic in nature is capable of binding the soil particles which improves soul structure. Irrigation was ranked sixth (3.95) as one of the practices to assuage climatic effect on maize farmland. The exposure of farmland to the harsh weather in the sunny period of the season leads to evaporation of surface water which primarily furnish the surface feeder crops. The use of irrigation is an attempt to replace the excessive water loss to the atmosphere. Planting of drought Tolerant maize was ranked seventh (3.73). This practiced is believed to be applied to safeguard maize plants from being dehydrated or predisposed to evapo-transpiration which can impede the plant growth.

3.4. *Constraints to the Use of CSAPs by Maize Farmers*

The high level of illiteracy (31.7%) affects the choice and use of CSAPs as the use of innovation requires some level of education for an impeccable implementation (Table 5). This agrees with the work of Ndamani & Watanabe (2016) that education plays a significant role in farmers' adaptation to climate change and farmers with higher levels of education are more likely to use improved technologies in order to adapt to climate change. High cost of farm inputs was ranked second as one of the impediments to the use of CSAPs. It could be inferred from this that with high cost of inputs, maize farmers can only own a small plot of land which may not require much time to oversee and get any problem solved. Lack of awareness of CSAPs was ranked third and it is believed to be a problem because some farmers are yet to know whether it is in existence or not. Insufficient extension services are ranked fourth among the constraints as one of the primary means of informing the maize farmers on it is the extension agents who visit the farmers, train and give them technical information for the efficient performance on their various farms. Limited access to credit was ranked fifth as one of the impediments to CSAPs use by the maize farmers. This is probably because, the use of any innovation is at a cost because it serves the purpose of improving the quality and quality status of the crop farm. Land tenure issues ranked sixth. The reason for this is that the fragmentation of farm plots which reduces farm size when scattered hampers the use of a practice that can enhance post-planting activities and the eventual maximum performance of crop. This outcome is in tandem with the findings of Obeta (2014) who submitted that large expanse of farmlands increases the potentials of maize productions. Post-harvest losses or poor storage facilities can also hinder the use of CSAPs among the maize farmers, in the sense that, losses when

Table 4: Climate smart agricultural practices (CSAPs) strategies chosen by the rrespondents

Strategies	SE	E	U	I	SI	WS	MWS	Rank
Drought Tolerant Maize Variety.	31(25.8)	62(51.7)	5(4.2)	7(5.8)	15(12.5)	447	3.73	7th
Minimum tillage	56(46.7)	48(40)	14(11.7)	1(0.8)	1(0.8)	517	4.30	2nd
Organic manure application	33(27.5)	7663.3)	6(5)	3(2.5)	2(1.7)	495	4.13	5th
Crop Rotation	74(61.7)	28(23.3)	12(10)	5(4.2)	1(0.8)	529	4.40	1st
Early Planting	45(37.5)	62(51.7)	7(5.8)	2(1.7)	4(3.3)	502	4.18	4th
Intercropping	64(53.3)	31(25.8)	15(12.5)	5(4.2)	5(4.2)	504	4.20	3rd
Irrigation	56(46.7)	32(26.7)	12(10)	10(8.3)	10(8.3)	474	3.95	6th

Source: Field Survey, 2025.

Table 5: Distribution based on constraints to the use of CSAPs by the maize farmers

Constraints	Frequency	Percentage (%)	Rank
Limited access to credit	13	10.8	5th
High level of illiteracy	38	31.7	1st
High cost of farm inputs	22	18.3	2nd
Insufficient extension services	16	13.3	4th
Lack of awareness of CSAPs	20	16.7	3rd
Land tenure issues	9	7.5	6th
Post-harvest losses/poor storage facilities	2	1.7	7th
Total	120	100.0	

Source: Field Data, 2025.

recorded on the farm can make farmers reduce their farm size which invariably leads to having lukewarm attitude to acceptance of CSAPs

5. Conclusion and recommendation

It could be concluded from the study that the use of CSAPs was widely accepted by the farmers but its implementation on the farm could be strongly influenced by financial buoyancy, regular extension contacts, cooperative membership, exposure to agriculture-related training and appreciable farm size among others. It could recommended that: climate change management training should be organized for the organized for the maize farmers in order to shield them from weather-risks to enhance bumper harvest in the production season; extension services should be made available to maize farmers on a regular basis; credit facilities should be made available to farmers without constraints as the choice and use of novel agricultural practices requires money; symposium and public advocacy programs should be organized seasonally to expose farmers to the strategies to be employed in preventing unforeseen climate hazards and basic agricultural inputs should be made available to farmers at a low and affordable price

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