



**PERCEPTION OF EXTENSION WORKERS ON CLIMATE-SMART
AGRICULTURAL PRACTICES IN EKITI STATE**

**¹Obabire, Ibikunle E., ¹Ayoola, Dare. O., ¹Obayemi, Pelumi D., ²Oyewusi, Isaac K.,
³Adeleye, Ifeoluwa A. and ³Atere, Olorunmola B.**

^{1,3}Department of Agricultural Technology, Federal Polytechnic, Ado-Ekiti, Ekiti State, Nigeria,

²Department of Horticultural Technology, Federal Polytechnic, Ado-Ekiti, Ekiti State, Nigeria

All correspondence to: obabire_ie@fedpolyado.edu.ng, edwardpel2000b@gmail.com

ABSTRACT

The study examined the perception of extension workers on Climate-Smart Agricultural practices (CSAP) in Ekiti State. The specific objectives of the study were to; know the occupational characteristics of the Extension Workers; examine the Extension Workers' awareness of Climate-Smart Agricultural practices, find out their knowledge on, and perception towards CSA in the study area. Fifty-one (51) respondents were chosen through a census sampling procedure to constitute the sample size for the study. The instrument used for data collection was questionnaire. The data collected were analysed using descriptive statistics such as frequency counts, percentage, mean and standard deviation. Pearson Product Moment Correlation (PPMC) was used to analyze the hypotheses. The findings revealed that the mean age, income, household size and farming experience of the respondents were 46.96 ± 6.98 year, $\text{₦}74862.75.85 \pm 19609.20$, 4.96 ± 1.04 persons and 20.27 ± 6.37 years, respectively. The awareness of CSA was high among the respondents. Knowledge of CSAP was also high among the majority (60.8%) of the respondents. While the perception of CSAP was unfavourable among the higher proportion (51%) of the respondents. There was a significant and positive relationships between the respondents' awareness ($r=0.303$, $p=0.031$) and their perception toward CSAP. The study therefore concludes that the awareness of climate-smart agricultural practices was high among the respondents while their perception towards climate-smart agricultural practices was unfavourable. There is a need for adequate training on the benefits of climate-smart agricultural practices for the extension workers in the study area as to help improve their perception.

Key words: *Climate-smart agriculture, extension workers, perception.*

INTRODUCTION

Climate change is a global challenge and the agricultural system among other sectors is still facing its threats. According to Elum *et al.*, (2017), climate change is a global problem and its impact is made visible especially in the agricultural sector where it has significantly affected production in most developing countries. This has made the citizens of most of these countries to be highly vulnerable to food insecurity (Olorunfemi *et al.*, 2020). It is reported that the situation of the agricultural sector will be exacerbated by climate change, which will have significant impacts on the various dimensions and determinants of food security. The impact of climate change is much stronger in Africa, where rain-fed agriculture is vital for daily subsistence, but where adaptive capacity is low (Cudjoe, *et al.*, 2021). Agricultural practice in Nigeria is mostly rainfed and climate reliant. In Nigeria, like in the rest of the developing countries, agricultural production is weather-dependent (Sowunmi and Akintola, 2010). Climate-Smart Agriculture (CSA) has been identified as an alternative that can increase agricultural productivity while at the same time mitigating the multiple effects of Climate Change. Climatesmart agriculture (CSA) is a key concept in the present discourse of climate change mitigation and adaptation (FAO, 2017; IPCC, 2019; Klytchnikova *et al.*, 2015). According to Lipper *et al.*, (2014), CSA can be defined as an agricultural activity that: mitigates greenhouse gas emissions, increases the adaptive capacity of farmers, and sustainably intensifies agriculture for better livelihoods. Awareness and disposition of Extension Workers on CSAP remain very crucial in disseminating CSAP related innovations to farmers for adoption, in order to mitigate the effect caused by Climate Change. Agricultural Extension has been very important in promoting rural livelihood globally. Extension workers are saddled with the responsibility of transferring technology and providing advisory services to rural farming households in many developing countries including Nigeria (Davis 2016; Olorunfemi and Oladele, 2018). More importantly, effective agricultural extension service among other things, encompasses the provision of timely information to farmers. The availability of such apt information will allow farmers to immediately respond to problems faced on their farms such as the inimical effect caused by climate change (Olorunfemi, *et al.*, 2021). The response of agricultural extension systems in playing this role effectively is dependent on several factors crucial among which is their perception. Therefore, this study assessed the perception of extension workers in Ekiti State on six various classifications of CSA which includes; water management initiatives, crop-mix related practices, tillage-smart, fossil-burning reduction practice, soil related practice and ICT and other adaptative practice. This is aimed at providing detailed insight to extension administrators and other stakeholders in CSA on packaging the

much needed in-service training that will enhance the capacity of extension agents to effectively disseminate innovations and provide advisory services on CSA to farmers in the study area.

I. RESEARCH METHODOLOGY

This study was carried out in Ekiti State, Nigeria. Ekiti State is one of the South western States in Nigeria. Survey research design was used for the study. The target population of the study comprised all the extension workers in the study area. Census procedure was employed to select all the (51) extension agents across the three Agricultural Development Programme (ADP) zones in the State as at the time of the study.

Table 1: Sampling frame

Zone 1 (Blocks)	Extension personnel	Zone 2 (Block)	Extension personnel	Zone 3 (Blocks)	Extension personnel
Ado block	4	Ikere block	3	Oye block	3
Igede block	3	Ilawe block	3	Ido block	3
Aramoko block	3	Ise block	3	Ikole block	3
Ijero block	4	Emure block	3	Otun block	3
Efon block	3	Ode block	3	Iye block	3
				Omuo block	4
Total	17		15		19

The instrument for data collection was questionnaire which comprised open and close ended questions to elicit data on the various objectives of the study.

The dependent variable- Perception on Climate-Smart Agricultural practices was measured on a 5-point Likert scale of strongly agree, agree, undecided, disagree and strongly disagree which attracted the scores of 5, 4, 3, 2 and 1, respectively, for positive statements and 1, 2, 3, 4 and 5 for negative statements. The mean was obtained and used to categorize the respondents based on their perception. Respondents with scores below the mean score had unfavourable perception while those with the scores of mean and above had favourable perception. The data collected were analysed using frequency counts, percentage, mean and Pearson product moment correlation (PPMC).

II. RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The results of the socio-economic characteristics of the extension workers (Table 2) show that extension workers between 41-50 years of age had the highest percentage (56.9%) among other age groups and the mean age was 46.96 ± 6.98 years. It implies that, extension workers in the study area were still active and agile to perform their duties as expected. Extension work in the study area is male-dominant as presented in the table where the majority (60.8%) of the respondents were male extension workers. This aligns with the finding of Obabire *et al.*, (2021) that men were more involved in extension services than women. The table also revealed that 96.1% which form the majority of the respondents were married. This is consistent with Adesope *et al.* (2007) who stated that most of the agents in the southern part of Nigeria are married. This indicates that most of the extension agents have family responsibilities ties that will compete for their attention and if this is not properly managed, it might likely reduce their involvement in disseminating CSA initiatives (Olorunfemi *et al.*, 2020).

The study further revealed that 98% of the extension workers in the study area were educated with the highest education qualification of HND/B.Agric/B.Sc. This finding aligns with Fabusoro *et al.* (2008) who reported similar findings among extension agents in the zones. This implies that most of the extension agents were educationally qualified for the job as they have above the minimum qualification needed to occupy the position (i.e. National diploma). The results revealed that 90.2% of the respondents belong to one professional body or the other. This may enable them gain access to CSAP related innovations in their conferences. The table also indicated that 82.4% of the respondents earned between ₦51000- 100,000 while 9.8% earned below ₦50,000 and 7.8% earned above ₦100,000. The mean income was ₦74862.75.85 \pm 19609.20, and the implication is that their income may be inadequate given the prevailing economic situation in the country.

The results (Table 2) also revealed that majority (58.8%) of the respondents' work experience ranges from 1-20 years, while only 3.9% of the respondents had more than 30 years of work experience, and the mean work experience was 20.27 ± 6.37 years. The implication is that the extension workers had considerably high work experience that could assist them in dissemination of innovations. This aligns with Bahua *et al.* (2013) who stated that increase in years of experience of extension agents improves their job performance in diffusing innovations to farmers.

Table 2: Socio-economic and occupational characteristics of the respondents

Variables	Frequency	Percentage	Mean
Age of the respondents (years)			
20 -30	1	2.0	46.96±6.98
31 – 40	5	9.8	
41 – 50	29	56.9	
51 – 60	16	31.4	
Sex			
Male	31	60.8	
Female	20	39.2	
Marital Status			
Single	1	2.0	
Married	49	96.1	
Widowed	1	2.0	
Educational Qualification			
HND/B.Agric/B.Sc	50	98.0	
M.Sc	1	2.0	
Membership of a professional body			
Member	46	90.2	
Non-member	5	9.8	
Income per annum (₦)			
≤ 50000	5	9.8	74862.75.85±19609.20
51000 – 100000	42	82.4	
> 100000	4	7.8	
Work experience (Years)			
≤ 20	30	58.8	20.27 ±6.37
21 – 30	19	37.3	
> 30	2	3.9	

Source: Field survey, 2022.

Awareness of Climate-Smart Agricultural Practices

The result of the analysis (Table 3) revealed that (100.0%) of the respondents were aware of the following aspects of climate-smart agricultural practices: Water Management initiative, Crop-mix related practices, tillage-smart practices, soil related practices and ICT/internet of things and other adaptive practices. The result also revealed that only (23.5%) of the respondents were aware of fossil-burning reduction practices. This implies that the overall awareness of CSAP was high among the respondents. The findings could further imply that the extension workers had access to information on contemporary issues among which CSAP is paramount. For instance, the world bank group is currently scaling up climate-smart agriculture and thirteen countries as well as and multiple partners, are involved under their West Africa Agricultural Productivity Program (WAAP); helping develop climate-smart varieties of staple crops, such as rice, plantains, and maize (World Bank, 2021). The efforts of world bank might have created awareness among the participating countries and beyond, thereby increasing the awareness among the stakeholders among which extension agents are prominent. The high level of awareness of CSAP among the extension agents could greatly assist them in relating productively with their farmers as regards useful innovations.

Table 3: Distribution of the respondents based on their awareness of climate-smart agricultural practices in the study area.

S/N	Awareness of CSA	Freq.	%
1	Water management initiative	51	100.0
2	Crop-mix related practices	51	100.0
3	Tillage-smart practices	51	100.0
4	Fossil-burning reduction practices	12	23.5
5	Soil related practices	51	100.0
6	ICT/Internet of things and other adaptive practices	51	100.0

Source: Field survey, 2022

Perception of extension workers towards climate-smart agricultural practices

Table 4 presents the results of the analysis of perception of extension workers towards CSAP. According to the table, the statement that water management practices were essential in CSA

ranked 1st among the perception statements presented to them with the mean of 4.78. This shows that the extension agents considered water management practices a must in CSA. This could be as a result of their knowledge on what unavailability of water could cause in agricultural production practices. Katengeza *et al.*, 2012 reported that most of the climate-related factors are found to have a significant impact on CSA adoption. CSA packages are more likely to be adopted in drought and waterlogged areas. The second most favoured perception statement is that integrated soil management practices were important in CSA (mean=4.65). This shows that the extension agents believed that integrated soil management is an essential part of CSAP. They also opined that drip irrigation could be considered relevant in CSAP (mean=4.57). In the same vein, they believed bush burning could not supply nutrient to the soil (mean=4.14), and as a matter of fact should not be considered a CSA practice. They also felt that CSA discourages refuse burning (mean=3.98). This implies that refuse burning should not be considered in CSAP. This should be seen as a good omen as it portends that in line with the recent advocacy by many development agencies of no-burning (Olorunfemi *et al.*, 2021). Also, these results support the previous work of Maguza-Tembo *et al.* (2017), who found that the quality of the soil and the weather conditions affect the farmers' adoption decisions. In addition, they also felt that crop diversification through rotation was necessary in CSA (mean=3.98). Furthermore, they believed that direct planting under reduced tillage should be encouraged in CSAP (mean=3.78). The implication of these findings is that the potentials of all the favourably perceived CSAP to mitigate the effects of climate change among the farmers in the study area could be greatly annexed by the extension agents through dissemination of such innovation.

The findings revealed that CSAP such as water management initiative, fossil-burning reduction, soil related practices and tillage-smart practices were somewhat favourably perceived by the extension agents while crop-mix related practices, and ICT and other adaptive practices were somewhat unfavorably perceived by the extension agents. While the extension agents may be well-positioned to disseminate water management initiative, reduction of fossil-burning and tillage smart practices to farmers based on their perception, there is need for training on crop-mix related practices and ICTs and other adaptive practices for the extension agents. This corroborates the findings of Izuogu *et al.* (2021) that training needs of extension workers for climate resilience in Nigeria among other must include capacity building on ICT usage for information transfer to farmers. This corroborated the findings of Leavy and Smith (2010), who found that older farmers were more risk averse and less likely to make long-term investments in the farm than younger farmers who have information technology knowledge and background.

Table 4: Distribution of the respondents based on their perception towards climate-smart agricultural practices

S/N	Perception statements	SA	A	U	D	SD	Mean	Rank
Water management initiative (WMI)								
1	Water management practices are essential in CSA	78.4	21.6	-	-	-	4.78	1 st
2	Drip irrigation could be considered irrelevant in CSA	-	-	-	43.1	56.9	4.57	3 rd
Crop-mix related practices								
3	Crop mix practices are not necessary in CSA	-	54.9	15.7	29.4	-	2.75	10 th
4	Mixed cropping is an important CSA crop-mix practice	-	23.5	21.6	54.9	-	2.69	11 th
Tillage-smart practices								
5	I believe direct seeding under reduced tillage is not good in CSA	-	5.9	9.8	84.3	-	3.78	7 th
6	I feel zero tillage should be encouraged in CSA	-	54.9	19.6	25.5	-	3.29	9 th
Fossil-burning reduction practices								
7	I feel bush burning supplies good soil nutrients in CSA	-	-	-	86.3	13.7	4.14	4 th
8	I don't think CSA discourages refuse burning since it provides soil with wood ash.	-	-	2.0	98.0	-	3.98	5 th
Soil related practices								
9	Integrated soil management practices are important in CSA	64.7	35.3	-	-	-	4.65	2 nd
10	I believe crop diversification through rotation is necessary in CSA	5.9	90.2	-	3.9	-	3.98	5 th
ICT/Internet of things and other adaptive practices								
11	Monitoring temperature and soil moisture content using sensor should be considered a waste of time.	2.0	31.4	-	49.0	17.6	3.49	8 th
12	I'm not sure the use of drones for irrigation is an important activity in CSA	-	56.9	21.6	21.6	-	2.65	12 th

Source: Field survey, 2022.

Level of Perception of the respondents towards CSA

The result (Table 5) shows that the perception towards climate-smart agricultural practices in the study area was unfavourable among the higher proportion (51%) of the respondents. However, the perception could also be considered as mixed, given the 2% difference between those that perceived the CSAP favourably and those that perceived the practices otherwise. This level of perception could discourage the promotion, dissemination and adoption of CSAP in the study area if necessary training on the benefits of CSAP is not earnestly provided.

Table 5: Mean Categorisation of the respondents based on their perception towards climate-smart agricultural practices in the study area

Perception category	Score	Frequency	Percentage
Unfavourable perception	< 44.75	26	51.0
Favourable perception	≥ 44.75	25	49.0
Minimum Score	39.0		
Maximum Score	52.0		
Mean Score	44.75		

Source: Field survey, 2021.

Relationship between the awareness of the extension agents on CSAP and their perception toward CSAP.

Table 6 shows that a positive significant relationship existed between awareness of the extension agents on CSAP and their perception towards CSAP ($r= 0.303$, $p =0.031$). The implication is that the perception of the respondents was positively influenced by their awareness. The positive correlation shows that the more the awareness status of the extension workers on CSAP, the favourable their perception. This implies that those with more awareness perceived CSAP favourably than those with low level of awareness on CSAP. This result is in tandem with Autio, et al., (2021) which opine that awareness of climate-smart agricultural (CSA) practices and access to climate-smart technologies are key factors in determining the utilization of CSA.

Table 6: Correlation analysis of the relationship between the awareness of the respondents and their perception towards climate-smart agricultural practices

Variable	r-value	p-value	Decision
Awareness of the respondents and their perception	0.303	0.031	Significant

towards climate-smart agricultural practices

Source: Field survey, 2022

III. CONCLUSION

The extension workers were mostly middle-aged and they were mostly male, married and uneducated with Bachelor's Degree and Higher National Diploma. The awareness of Climate-Smart Agriculture was high among the respondents. The perception of the respondents towards Climate-Smart Agriculture was unfavourable. There was a significant relationship between awareness of the extension agents on Climate-Smart Agricultural practices and their perception towards Climate-Smart Agricultural practices. Seminars and workshops should be organised for the extension workers by the Government and relevant stakeholders to improve their dispositions to climate smart agriculture.

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