

Perception of Agricultural Education Students on the effects of Climate Change on farming Activities in Tertiary Institutions of Southwest, Nigeria

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Abstract

The study examined the perception of agricultural education students on the effects of climate change on farming activities in tertiary institutions of Southwest, Nigeria. Multistage sampling technique was used to select 95 students from both institutions used for the study, while oral Interview or interview guides were used to collect data. Frequency counts, simple percentage, Pearson Product Moment Correlation (PPMC), Analysis of variance (ANOVA) and Independent t-test were used to analyze the data. From independent samples t- test, the p-value (0.000) is less than the standard significance level of 0.05, male and female perception on the effect climate change is high. PPMC ($r = .663$, $p < 0.05$) revealed a significant relationship between agricultural education student's sources of information and their perception on the effect of climate change on farming activities. PPMC ($r = 0.456$, $p < 0.05$) revealed a significant relationship between socio economic characteristics of agricultural education students and their knowledge of causes of climate change. ANOVA ($F = 6.765$, $p < 0.05$) showed a statistically significant difference between agricultural education students' perceptions on the effect of climate change on farming activities in tertiary institution. It can be concluded that respondents have diversity of perception on the effects of climate change on farming activities in tertiary institutions. It is recommended that climate related courses particularly courses on climate change, mitigation and adaptation must be integrated in the curriculum of Agricultural education/Agricultural disciplines in the tertiary institutions to enhance and prepare students for future scenario of climate change as it affects agricultural production and farming activities.

Keywords: Climate change, Environment, Farming activities, Perception, Information Source

Introduction

Climate change is generally recognized as the major environmental problem facing the world today. As a result of climate change, average temperature has been rising and is expected to continue while changes in precipitation patterns (rainfall) is unpredictable as a result, a variety of effects such as rise in sea level, desertification, extinction of rare plants and animal species, shifting of agro-ecological patterns or zones and changes in the occurrence of extreme weather events such as floods, droughts and heatwaves have been common experience in various regions of the world (Maskell &Joshson,, 2016). Therefore, climate change is considered as one of the most serious threats to the current and future agricultural development as its adverse impacts are already observed on the environment, human health, food security, economic activities, natural resources and physical infrastructure (Bozoghu *et al.*, 2022). The impact and consequence of climate change are not evenly distributed, the developing countries are the most vulnerable to the impacts of climate change because of the low capacity in terms of social, technological and financial wherewithal to adapt to climate change. It is predicted that billions of people, especially those in the developing countries will face food insecurity due to crop failure which will pose greater risk to life and health. Therefore, climate change is expected to have far reaching effects on the sustainable development of developing countries thereby limiting their ability to attain the United Nations Sustainable Goals of ensuring sufficient and nutritious food all year round by 2030 (United Nation, 2007). Africa is already a continent under pressure from climate stress and is highly vulnerable to the impacts of climate change because many areas in Africa are recognized as having climates that among the most variable in the world on a seasonal and decadal time scales. Extreme events such as floods and droughts can occur in the same area within few months to each other. Nigeria, in particular is vulnerable to all kinds of climate related problems due to anthropogenic behavior of its citizens, unless it adapts or adjusts to the actual impacts of climate change. Some of the observed consequences of climate change in Nigeria include thunderstorms, widespread floods, and incessant drought. Odey (2009) pointed out that climate change impacts pose greater dangers with consequences such as desertification, sea level rise, flood, water shortages or drought during farming season, yield reduction or no yield at all (loss of harvest), disruption of farming activities etc. Climate change will affect everyone, every part of the environment and resources, and therefore, every facets of our lives (Ekpo, 2009).

Despite the huge threats from impacts of climate change, many people, government in Nigeria are not aware of or not taken adequate measures to mitigate the adverse impacts of climate change on socio-economic life of the people. It is aggravated by the lack of knowledge of the causes, impacts and adaptation strategies. According to Bozoglu *et al.*, (2022) there is always a difference in understanding the impacts of climate change as a result of the gap in the knowledge of the general public and that of the experts. It is necessary to have climate issues in the educational curriculum in order to educate people to have it knowledge at every level, especially at the tertiary level of education in order for students to have a clear perception, knowledge and understanding of the phenomenon and rule out misconceptions by the students (Freije *et al.*, 2017; Otufale & Igbosanu, 2023). According to Skamp-Boyes and Stanisstreet (2009) and Kilinc *et al.*, (2011) environmental education on climate change from primary to tertiary level is the most effective way to create awareness and disseminate knowledge to the public all over the world because these students will be either part of the experts or general public in the future. Moreover, in order to adapt to the problem of climate change effectively, there is the necessity to understand the level of knowledge, awareness and perception of climate change, especially the causes, effects and possible mitigation and adaptation behavior and strategies (Mase *et al.*, 2017). Previous studies on climate change emphasized adequate and sound knowledge about the nature, causes and effects of climate change is a critical determinant of engagement in change mitigation and adaptation efforts (Bord *et al.*, 2015 ; Lorenzoni *et al.*, 2017). According to Tobbler (2015) Students of tertiary institution are considered to be the education and policy leaders of the future, the lack of reasonable sufficient sound knowledge and perception about climate change may affect their attitude to climate change and willingness to act responsively to support climate change mitigation and adaptation policies and practices. Therefore, the general objective of the study was the assessment of the perception of Agricultural students on climate change in the Southwest, Nigeria.

The following research questions were raised as follows;

Research questions

1. What are the socio-economic characteristics of the Agricultural Education students?

2. What is the level of awareness of Agricultural Education students on the impact of climate change on farming activities?
3. What are the causes of climate of change?
4. What is the perception of Agricultural Education students on climate change?
5. How do Agricultural Education students source information on climate change?

Hypotheses

These were stated in the null form;

H₀₁: There is no significant relationship between agricultural education students' sources of information and their perception on the effects of climate change on farming activities

H₀₂: There is no significant difference between Agricultural Education students' perception on the effect of climate change on farming activities in tertiary institutions

H₀₃: There is no significant relationship between socio-economic characteristics of Agricultural education students and their knowledge of the causes of climate change

Methodology

The study was carried out in two institutions one located in Ogun State; Sikiru Adetona College of Education, Science and Technology, Omu-Ajose and Lagos State University of Science and Technology, Ikorodu, Lagos State. Multistage sampling technique was used for the study. The two institutions were purposively selected because there was Agricultural Education departments in each institution. The sample frame consists of one hundred and thirty-five students from both institutions. Simple random sampling technique was used to select 70% of the students in both institutions, therefore ninety-five (95) students were selected from Lagos State University of Science and Technology and Sikiru Adetona College of Education, Science and Technology given a sample size of 95 agricultural education students. The research instrument used to guide this study was interview guide. The data collected was analysed using frequency, simple percentage, Pearson Product Moment Correlation (PPMC) for hypotheses 1&3, Analysis of variance (ANOVA) for hypothesis 2 and Independent t-test to assess the perception of male and female students on the effect of climate change on farming activities.

Results

Table1: Results on Socio-Characteristics of Respondents

	Variable	Frequency	Percentage
Age	18-20yrs	34	35.8
	21-25yrs	59	62.1
	Above	2	2.1
	Total	95	100
Sex	Male	35	36.8
	Female	60	63.2
	Total	95	100
Level	100	57	60
	200	21	22.1
	300	17	17.9
	Total	95	100
Farming experience	0yrs	22	23.2
	1-5yrs	36	37.8
	6-10yrs	26	27.4
	10yrs above	11	11.6
	Total	95	100

Source: Field Survey, 2024

The above analysis revealed that 34 (35.8%) of the respondents were between the age range of 18-20yrs, 59(62.1%) of the respondents were between 21-25yrs while the remaining 2 (2.1%) of the respondents were above 25yrs of age.

Sex revealed that 38.9% of the respondents were male while 63.1% of the respondents were female. This shows that majority of the Agricultural Education students were female.

Level analysis shows that 57 (60%) respondents were 1001 students, 21 (22.1%) respondents were 200 while the remaining 17 (17.9%) respondents were 300 level students. It was revealed that majority of the students were 100 level students

Farming experience analysis discovered that 22 (23.2%) respondents had zero farming year of experience, 36 (37.8%) respondents had 1-5yrs of farming experience 26 (27.4%) respondents had 6-10yrs farming experience while 11 (11.6%) respondents had more than 10yrs farming experiences.

Table 2: Level of Awareness of Agricultural Education Students on the Impact of Climate on Farming activities

		Frequency	Percent
Valid	Low Awareness	55	56.7
	No Awareness	35	36.1
	High Awareness	7	7.3
Total		95	100.0

Source: Field Survey, 2024

The above table showed that 55 (56.7%) of the respondents had low level of awareness of Agricultural Education Students on the impact of climate on farming activities, 35 (36.1%) had no level of awareness while 7 (7.3%) had high level of awareness.

Table3: Causes of Climate Change

		Frequency	Percent
Valid	Natural variability	32	33.7
	Human activity	22	23.2
	Both	41	43.1
	Total	95	100

Source: Field Survey, 2024

The table shows the analysis of causes of climate change, it was revealed that 33.7% were caused by natural variability, 23.2% were caused by human activity while 43.1% were caused by both (natural variability and human activity) in the selected study area. Nevertheless, about 13% of the respondents gave equal weight to the naturally induced and human-induced climate change. (Ojomo *et al.*, 2015; IPCC, 2021).

Table 4: Perception of the Agricultural Education on the effects of Climate Change on Farming Activities

Sn/No	Items	Strongly agree	Agree	Strongly Disagree	Disagree
1.	The environment in this farm is changing due to human activities	31 (32.6)	30 (31.6)	19 (20)	15 (15.8)
2.	Climate changes has led to decline of farm resources	55 (57.9)	21 (22.1)	10 (10.5)	9 (9.5)
3.	Farm output are no longer abundant	66(69.5)	15 (15.8)	10 (10.5)	4 (4.2)
4.	Rainfall is decreasing every year	42 (44.2)	32 (33.7)	10 (10.5)	11 (11.6)
5.	The weather is becoming dry every year	38 (40)	32 (33.7)	17 (17.9)	8 (8.4)
6.	The yearly rains are not supporting crop production on the teaching and research farm as before	42 (44.2)	25 (26.3)	20 (21.1)	8 (8.4)
7.	There is high occurrence of infestation and disease on crop and livestock on the teaching and research farm	44 (46.3)	34 (35.8)	12 (12.6)	5 (5.3)
8.	There have been increase incidences of floods during the rainy season	56 (58.9)	23 (24.2)	9 (9.5)	7 (7.4)
9.	There have been increase incidences of droughts during the rainy season	69 (72.6)	10 (10.5)	11 (11.6)	5 (5.3)
10.	Temperature is rising	34 (35.8)	48 (50.5)	12 (12.6)	1 (1.1)
11.	The cost of food crops is increasing because of climate change	27 (28.4)	36 (37.9)	18 (18.9)	14 (14.7)

12.	Prevailing temperature has no effect on crop and animal production	52 (54.7)	15 (15.8)	17 (17.9)	11 (11.6)
13.	Increase in temperature has effect on egg production	58 (61.1)	23 (24.2)	7 (7.4)	7 (7.4)
14.	Flood reduces the yield of cassava harvested from the farm	59 (62.1)	27 (28.4)	9 (9.5)	0 (0)
15.	Storm is more frequent more than before as a result of climate change	49 (51.6)	24 (25.30)	12 (12.6)	10 (10.5)
16.	Effect of climate change has bought about frequent incidence of flooding on the farm	29 (30.5)	28 (29.5)	29 (30.5)	9 (9.5)
17.	Rainfall does start and end at normal period in the past 2 years	48 (50.5)	36 (37.9)	5 (5.3)	6 (6.3)
18.	There is now a change in planting date due to climate change	44 (46.3)	24 (25.3)	15 (15.8)	12 (12.6)
19.	There is increase in yield of crop as a result of climate change	55 (57.9)	28 (29.5)	9 (9.5)	3 (3.2)
20.	Death of livestock	59 (62.1)	19 (20.0)	9 (9.5)	8 (8.4)
21.	Wilting of crop	54 (56.8)	20 (21.1)	11 (11.6)	10 (10.05)

Source: Field Survey, 2024

The above analysis revealed that majority of the respondents agreed that the environment in this farm is changing due to human activities 64. %. climate changes have led to decline of farm resources with 78.0%. Some also agreed that Farm output are no longer abundant with 69.5%, rainfall is decreasing every year with 44.2%, the weather is becoming dry every year with 73.7% and so on. This shows that majority of the respondents agreed that there is high perception of the agricultural education students on the effects of climate change on farming activities.

Table 5: Perception of Male and Female on the effect of climate change on Farming activities

Group Statistics								
	Sex	N	Mean	Std. Deviation	Std. Error Mean			
Perception Agricultural Student	Male	37	33.1081	6.49694	1.06809			
	Female	58	40.5345	7.27942	.95584			
				F	Sig.	t	df	Sig. (2-tailed)

Perception Agricultural Students	Equal variances assumed	.800	.373	-5.052	93	.000
	Equal variances not assumed			-5.181	83.092	.000

Source: Field Survey, 2024

The output in Table 5 indicates that the mean for Male is 33.1081 and for Female is 40.5345. Looking at the Standard Deviation column, it shown that they were not exactly equal, but close enough to assume equal variances.

Because the p-value (0.000) for our independent samples t test is less than the standard significance level of 0.05, male and female perception is high. Data support the claim that the population means are different. Specifically, Female’s mean is greater than Male’s mean. This shows that Female perception on the effect of climate change is better than Male perception.

Table 6: Agricultural Education students’ source of Information on Climate

		Frequency	Percent
Valid	Lecturer	6	6.2
	Students	4	4.1
	Journal Articles	39	40.2
	Textbooks	5	5.2
	Radio	3	3.1
	Television	6	6.2
	Internet	28	28.9
	Others	4	6.2
	Total	95	100.0

Source: Field Survey, 2024

The above analysis shows the sources of information on climate change, it was shown that 6.2% sourced from their lecturer, 4.1% sourced from their colleagues (students), 40.2% sources from journal and articles, 5.2% sources from textbooks 3.1% sourced from radio 6.2% sourced from television 28.9% sourced from internet while 6.2% sourced from other sources of information. This shows that majority of the respondents’ sources information from Journal Articles about climate change

4.2 Hypotheses

H₀₁: There is no significant relationship between agricultural student’s sources of information and their perception on the effect of climate change on farming activities

Table 7: Agricultural students ‘sources of information and perception on the effects of Climate change on farming activities

		Perception Agricultural Student	Sources of information on climate change
Perception Agricultural Students	Pearson	1	-.663
	Correlation		
	Sig. (2-tailed)		.003
	N	95	95
Sources of information on climate change	Pearson	.663	1
	Correlation		
	Sig. (2-tailed)	.003	
	N	95	95

From the output we can see the following values, Pearson correlation coefficient: .663, p-value of Pearson correlation coefficient: .003, the null hypothesis is hereby rejected, alternative hypothesis is accepted that there is significant relationship between agricultural education student’s sources of information and their perception on the effect of climate change on farming activities since the p-value in the output (.003) is less than .05, we reject the null hypothesis. The Pearson correlation coefficient (.663) was a positive value, this indicates that there is a positive correlation between the two variables. This implies a significant relationship between the sources of information utilized by agricultural students and their perceptions of the effects of climate change on farming activities. The findings were in line with Lee *et al.*, (2024) climate change poses a critical threat to agricultural productivity, affecting crop yields, livestock health, and the sustainability of farming practices and understanding how future agricultural professionals perceive these changes and the sources from which they obtain their information is crucial for developing effective educational and policy interventions. Popoola *et al.*, (2020) indicated that agricultural students rely on various sources for information about climate change, including academic journals, online platforms, agricultural extension services, media outlets, and personal networks. Each source plays a distinct role in shaping their understanding and attitudes toward climate-related issues in agriculture.

Ho2: There is no significant difference between agricultural education students' perceptions on the effect of climate change on farming activities in tertiary institution

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1055.029	3	351.676	6.765	.000
Within Groups	4730.802	91	51.987		
Total	5785.832	94			

From the ANOVA table, there is significant result. The value of F is (.6.765), which reaches significance with a *p*-value of .000 which is less than the .05 alpha level. This means there is a statistically significant difference between agricultural education students' perceptions on the effect of climate change on farming activities in the tertiary institutions. The findings collaborate with Brown (2021) that climate change continues to be a pressing issue which affect agricultural practices globally. In the tertiary institutions, students pursuing agricultural education are at the forefront of understanding and addressing these impacts. However, the result indicates that there is a significant difference in the perceptions of agricultural education students regarding the effects of climate change on farming activities. Brown (2021) institutions that prioritize climate-related coursework and practical training discovered that their students exhibit higher awareness and proactive attitudes towards climate adaptation strategies. In contrast, students whose programmes were less focus on these areas might underestimate the severity of climate impacts on agriculture. Green and White (2020) found that students with direct exposure to farming and rural life were more likely to recognize the practical challenges posed by climate change and advocate for adaptive measures. Conversely, students from non-agricultural backgrounds might rely more on theoretical knowledge, which can result in varying levels of concern and understanding about climate-related issues.

Ho3: There is no significant relationship between socio-economic characteristics of Agricultural education students and their knowledge of causes of climate change

		Socio- Characteristics	Causes of Climate Change
Socio-Characteristics	Pearson Correlation	1	.456
	Sig. (2-tailed)		.001
	N	95	95
Causes of Climate Change	Pearson Correlation	.456	1
	Sig. (2-tailed)	.001	
	N	95	95

From the output, Pearson correlation coefficient is .456, p-value of .001, the null hypothesis is hereby rejected, alternative hypothesis is accepted that there is significant relationship between socio economic characteristics of agricultural education students and the knowledge of causes of climate change. Since the p-value in the output (.001) is less than .05. The Pearson correlation coefficient (.456) was a positive value, this indicates that there is a positive correlation between the two variables. This showed that there was significant relationship between socio-economic characteristics of Agricultural education students and their knowledge of the causes of climate change. Chen (2021) found that students from affluent backgrounds, level, age were more likely to possess advanced knowledge about the scientific causes of climate change. These students typically have access to well-resourced schools, private tutoring, and educational technologies that provide comprehensive information on environmental issues. In contrast, students from lower-income families may attend under-resourced schools with limited access to up-to-date educational materials, which can hinder their understanding of complex topics like climate change.

Conclusion

Based on the results of this study, it can be concluded that respondents have diversity of perception on the effects of climate change on farming activities in tertiary institutions. It is recommended that climate related courses particularly courses on climate change, mitigation and adaptation must be integrated in the curriculum of Agricultural education/Agricultural disciplines in the tertiary institutions to enhance and prepare students for future scenario of climate change as it affects agricultural production and farming activities.

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