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RESEARCH ARTICLE

Factors Influencing Farmers' Attitude to Adopt Drought Tolerant Maize Varieties in Ondo State, Nigeria

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ABSTRACT

The study investigated factors influencing farmers' attitude towards adoption of drought-tolerant maize varieties. One hundred maize farmers were selected using a multi-stage sampling procedure and data were collected through structured questionnaires. Information was collected on the socio-economic characteristics of the maize farmers, farmers' level of awareness of drought-tolerant maize varieties, farmers' attitudes towards agricultural innovation, constraints to adoption of drought-tolerant maize varieties and, factors influencing farmers' attitude towards adoption of drought-tolerant maize varieties. Data were analyzed using frequencies, percentages, Pearson Product Moment Correlation and Logit regression. The findings revealed that 76% of the maize farmers had limited awareness regarding the benefits and characteristics of drought-tolerant maize varieties. Also, the majority (74%) of the farmers lacked knowledge about the quality and advantages of these varieties. Despite positive attitude (mean = 4.28) which was measured at ordinal level, several constraints to adoption were identified, mainly low output of drought tolerant maize varieties (mean = 2.30). The findings also showed the substantial impact of two key factors (that is, sex and income) as factors influencing farmers' attitude to adopt drought-tolerant maize varieties. Farmers are yet to take advantage of drought-tolerant maize varieties as a mitigating strategy against climate change. The need for extension services and non-governmental organizations to step up awareness creation and training on best agronomic practices in growing the maize varieties is recommended.

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1. Introduction

Agriculture continues to play a crucial role in sustaining the livelihoods of the majority of rural households in sub-Saharan Africa. Despite the significant prominence of the petroleum sub-sector in Nigeria's economy, it is imperative to underscore the essential contribution of the agriculture sector to the country's Gross Domestic Product. According to Food and Agriculture Organization (FAO, 2023), over 70% of Nigeria's population depends on agriculture for their employment and livelihoods. Despite the significant portion of the population in Nigeria relying on agriculture for their livelihoods, the country continues to face food scarcity. Approximately 20 percent of Nigeria's population endured food insecurity between 2018 and 2020 (Statista, 2023). This percentage of food-insecure households in Nigeria is expected to increase further due to population growth that is outpacing food production. In order to stem the tide against food insecurity, it is imperative to promote the widespread adoption of agricultural innovations. Agricultural innovation stands at the forefront of transformative

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change within the farming sector, acting as a pivotal force in driving heightened productivity and sustainability. Technological advancements in agriculture encompass a spectrum of innovations, ranging from precision farming and data analytics to the development of genetically modified crops and sustainable practices. These innovations not only enhance the efficiency of agricultural processes but also contribute to mitigating challenges such as climate change, resource scarcity, and evolving global food demands. Jamilu et al. (2014) asserted that farmers' socio-economic status plays a pivotal role in shaping their inclination towards adopting innovative agricultural practices. The socio-economic landscape of farming communities is diverse and complex, encompassing factors such as household income, education, access to resources, and land tenure. Understanding how these elements interplay with the adoption of innovative agricultural practices is crucial for designing effective interventions and policies that resonate with the realities of farmers.

Abhijeet et al. (2023) underscore the pivotal role of effective agricultural extension services in the diffusion of knowledge and technologies to farmers.

Agricultural extension services act as a crucial intermediary between research institutions and farmers, facilitating the transfer of up-to-date agricultural technologies, best practices, and scientific knowledge to enhance farm productivity. However, the efficacy of these services is contingent on various factors, including accessibility, adaptability, and the ability to cater to the diverse needs of farmers.

Climate change is impeding agricultural growth and affecting crop production in several parts of the country. It is expected to increase in the coming decades in the country where the adaptive capacity is weaker and its impacts on agriculture threaten both food security and agriculture's pivotal role of livelihoods development (Alemu & Mengistu, 2019). Adoption of improved crop varieties has a substantial impact on yield and contributes significantly to food security. This review delves into the realm of crop-specific innovations, with a focus on key crops such as maize, rice, and wheat. It scrutinizes the adoption rates of these innovations and evaluate their overarching impact on agricultural sustainability. Climate change poses unprecedented challenges to global agriculture, necessitating a paradigm shift towards climate-resilient practices. Recent studies by IPCC (2022) underscore the urgency of addressing climate change effects on food production.

However, it has been observed that Agricultural Extension service has been lacking in both adequacy and effectiveness when it comes to fulfilling this crucial role (Uguru et al., 2015). Consequently, many agricultural technologies that could have significantly enhanced the productivity of smallholder farmers are still inaccessible. Moreover, various barriers impede adoption of agricultural innovations, including limited resources, the incompatibility and complexity of new technologies, a shortage of technical training and information, as well as socio-economic and cultural constraints (Silva & Broekel, 2017). Hence, there is an urgent requirement to tackle these obstacles to enhance farmers' production performance and work towards the goal of achieving food security.

Maize (*Zea mays L.*) stands as the world's most cultivated cereal crop and ranks third in terms of global consumption, following wheat and rice (FAO, 2021). Worldwide, maize production totals approximately 1,127 million tons (OECD/FAO, 2019). Africa contributes about 75 million tons of maize to the world production, which represents 7.5% of the total global output. Nigeria leads the continent in maize production, producing 33 million tons, followed by South Africa, Egypt, and Ethiopia (International Institute for Tropical Agriculture, 2021). Maize is produced in virtually every part of Nigeria by smallholder farmers. This cereal has emerged as a crucial crop for ensuring food security, serving both human and animal consumption needs in the country (Global Agricultural Information Network, 2017). However, when it comes to maize yield, Nigeria is positioned at 117th place, averaging 2.1 tons per hectare. In contrast, the United States leads with a remarkable yield of 28.5 tons per hectare, while Egypt holds the highest yield in Africa at 7.1 tons per hectare (FAO, 2020). Heavy reliance on rain-fed agriculture and limited adoption of improved varieties, particularly those resistant to drought, are contributing factors to the existing yield gap. This study was therefore designed to: describe the socio-economic characteristics of the maize farmers, determine farmers' level of awareness of drought tolerant maize varieties, ascertain farmers' attitude towards agricultural innovation, identify constraints to the adoption of drought tolerant maize varieties and examine factors influencing farmers' attitude toward adoption of drought tolerant maize varieties. The study hypothesized that there is no significant relationship between selected farmer's socio-economic characteristics and farmers' attitudes to adopting agricultural innovation and that there is no significant relationship between farmers' level of awareness and farmers' attitudes to adopting agricultural innovation.

2. Materials and Methods

Primary data were used for this study. Data were collected from maize farmers using well-structured questionnaire. The study adopted multi-stage sampling procedure. The first stage was random selection of two local government areas (LGAs) in Ondo State, Nigeria. The LGAs are: Owo and Ifedore. The LGAs were selected randomly because, it helps to mitigate the risk of bias in the selection. If the local governments were chosen based on specific characteristics, it might introduce bias if those characteristics are related to variables being studied. In the second stage, five rural farming communities, that is: Ohuze, and Ibeje community in Owo Local Government Area and Ikota, Ipogun and Ijare in Ifedore Local Government Area were randomly selected. The aforementioned communities

were selected in order to help in achieving a more representative sample and minimizes the risk of selecting communities that might not be typical of the larger population. In the third stage, twenty maize farmers were randomly selected from each community to give a sample size of one hundred (100) farmers with a 95% confidence level. This means that we are 95% confident that the characteristics and responses observed in the sample represent the entire population of maize farmers in the selected communities. The total sample size of one hundred (20 farmers x 5 communities) is determined by considerations such as available resources and time constraints. The maize farmers' level of awareness about drought tolerant maize varieties was measured by asking the farmers to indicate Yes or No to a list of awareness statements on drought tolerant maize varieties. The Yes response was coded one (1) and No coded as zero (0). Farmers' attitude towards agricultural innovation was measured on a five-point Likert-type scale of Strongly agree = 5, Agree = 4, Undecided = 3, Disagree = 2, Strongly disagree = 1. The grand mean was 2.05. Any item with a mean score of 2.05 and above was regarded as positive attitude and items with less than 2.05 were regarded as negative attitudes. Constraints to the adoption of drought tolerant maize varieties was measured on a three-point Likert-type scale of Major constraint = 3, Minor constraint = 2, and No constraint = 1. The grand mean is 2.06. Any item with a mean score of 2.06 and above was considered to be a constraint, and items equal to a mean score of 2.06 is considered to be a minor constraint, while any item less than 2.06 was not. Data collected were analyzed using descriptive statistics such as frequencies and percentages. Pearson Product Moment Correlation and Chi-square were used to test the study hypotheses. Logit regression was used to determine factors influencing farmers attitude to adopt agricultural innovations, the attitude was classified into positive attitude, coded as (1) and negative attitude coded as (0). A threshold value of 48 was used as the demarcation point. This calculation was derived by multiplying the total number of items (16) by the maximum obtainable points per item (5), resulting in 80. The total number of items (16) was then added to 80, yielding a sum of 96. Subsequently, this total of 96 was divided by two (2) to distinguish between positive and negative attitudes. Where any farmer with an attitude score above 48 was categorized as having a positive attitude, while those with scores below 48 were categorized as having a negative attitude.

The Logit regression analysis is explicitly represented below:

$$Y = b0 + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6$$

Where:

Y = Farmers' attitude to adopt agricultural innovation (Positive (1), Negative (0)

X_1 = Sex (Male 1, Female 0)

X_2 = Income (Naira)

X_3 = Age (Years)

X_4 = Farm size (Hectares)

X_5 = Years of Farming Experience (Years)

X_6 = Highest Level of Education (Number of years)

3. Results and Discussion

3.1. Socioeconomic Characteristics of the Maize Farmers

The socioeconomic characteristics of the maize farmers were presented in Table 1. Majority (69.0%) of the maize farmers were male while 31.0% were female. This is in agreement with the findings of Akinwale et al. (2020), that majority of maize farmers in Akure South and Akoko North West Local Government Area of Ondo state were predominantly male. Average age of the maize farmers in the study area was 42.0. This indicates that most of the maize farmers were still within the productive age with strength and agility to engage in agricultural practices. Most (67.0%) of the maize farmers were married. Also, a significant majority (57%) of maize farmers reported having household sizes ranging from 6 to 10 individuals, followed by 23% having household sizes between 1 and 5 members. The calculated mean of the household size stood at 8 persons, highlighting relatively large household sizes among maize farmers. This contradicts the results from Adebisi et al. (2017), which observed that majority (65.7%) of farmers had between 4 and 6 household size. According to the data collected, 43% of the maize farmers had secondary education, 27% had primary education, 25% had no formal education, while 5% had tertiary education. This result indicates that most of the farmers have attained appreciable level of education that will enhance their grasp of improved agronomic practices in maize production. Furthermore, most (72%) of the maize farmers had farm sizes between 1-4 hectares, 21% had 5-8 hectares and 7% had above 8 hectares farm size. The mean farm size was 4.0 hectares. This corroborates with the findings obtained by Owoeye et al. (2017), who reported that maize farmers in Ekiti state typically work on an average farm size of 3.4 hectares. This suggests that maize farmers in the study area are predominantly engaged in small-scale farming practices.

Table 1. Socioeconomic characteristics of the maize farmers.

Socio-economic characteristic	Frequency	Mean	Standard Deviation
Sex			
Male	69		
Female	31		
Age (Years)			
<20	3		
21-30	18	42.0	1.224
31-40	26		
41-50	32		
51-60	14		
>60	7		

Table 1. (continued)

Socio-economic characteristic	Frequency	Mean	Standard Deviation
Marital Status			
Single	11		
Married	67		
Widowed	18		
Divorced	4		
House Hold Size (Number of persons)			
1-5	23		
6-10	57	8.0	0.681
11-15	19		
16-20	1		
Level of Education			
No Formal Education	25		
Primary Education	27		
Secondary Education	43		
Tertiary Education	5		
Farm Size (Hectares)			
1-4	72	4.0	0.609
5-8	21		
9-12	7		

3.2. Maize Farmers' Level of Awareness of Drought Tolerant Maize Varieties

The result in Table 2 shows that majority (76%) of the maize farmers were not aware of maize varieties that can grow despite variability in rainfall patterns. This implies that there is lack of awareness among the maize farmers about certain aspects of maize production. This lack of awareness can undermine efforts at achieving food security and sustainable food production. Also, 74% of the maize farmers were not aware that some maize varieties can grow and produce even if rain fails. This situation may lead to poor yields and low economic returns for the farmers. This could also have broader implications on food security, as low yields could lead to food shortages, high food prices, and increased reliance on imports. Moreover, 71% of the maize farmers lacked awareness that certain agronomic practices, such as no-till maize production, could contribute to the reduction of greenhouse gas emissions. That the farmers were unaware of these agronomic practices may make them to be dependent on synthetic fertilizers which may not environmentally sustainable. On the other hand, majority (70%) of the maize farmers exhibited awareness regarding the existence of maize varieties resistant to pests and diseases. This awareness stands as an encouraging indicator for maize farming, as the recognition of pest and disease-resistant varieties bears the potential to diminish crop losses and enhance overall productivity.

Table 2. Maize farmers' level of awareness of drought tolerant maize varieties.

S/N	Statement	Yes F(%)	No F(%)
1.	Are you aware that some maize varieties can grow and produce even if rain fails	26(26)	74(74)
2.	Do you know that there are maize varieties that are pest and diseases resistant	70(70)	30(30)
3.	Are you aware you can plan your planting period with some maize varieties	46(46)	54(54)
4.	Do you know there are some maize seedlings that improves early seedling growth during the germination stage	45(45)	55(55)
5.	Do you know for best management against drought, maize seeds for planting must be bought every year and not from previous planting	44(44)	56(56)
6.	Are you aware you can determine yourself when to plant with some maize varieties	32(32)	68(68)
7.	Do you know with some best agronomic practices such as no-till, maize production can reduce greenhouse gas emission	29(29)	71(71)
8.	Are you aware of new improved maize varieties that is early maturing	41(41)	59(59)
9.	Are you aware of maize varieties that can still grow even when there is increase in variability of rainfall patterns	24(24)	76(76)

3.3. Farmers' Attitude Towards Agricultural Innovation

Table 3 shows that the strongest attitude of the respondents towards agricultural innovations was that they are willing to embrace any agricultural innovation provided the innovation was practicalised ($\bar{x}$ = 4.28). This suggests that the respondents recognize the importance of innovation in agriculture and are open to adopting new technologies and practices. This is a positive sign for the agricultural sector, as innovation can help to increase productivity, reduce environmental impact, and improve food security. This contradicts the findings of (Kazeem et al., 2017), who found out that farmers attitudes had an insignificant impact on technology adoption, but identified that negative perceptions of extrinsic factors, such as constraints on technology training, had a stronger influence on farmers' adoption of novel technology. Next is the belief that agricultural innovation is better than traditional practices ($\bar{x}$ = 4.08). This suggests that the respondents recognize the potential benefits of adopting new technologies and practices in

agriculture. They always wish to receive information about agricultural information ($\bar{x}$ = 4.07), which implies that the respondent has positive attitude towards receiving information about agricultural innovation. This suggests that the respondents are interested in learning about new technologies and practices in agriculture which will in turn increase their productivity. I often take my time before making a decision to adopt an agricultural innovation ($\bar{x}$ = 3.89), this implies that the respondents tend to deliberate and carefully consider before deciding to adopt new agricultural innovations. Other identified attitudes of the farmers include, their farmer friends who use new agricultural innovation influence them to do the same ($\bar{x}$ = 3.84). This suggests that social networks play an important role in the diffusion of agricultural innovations. Farmers may be more likely to adopt new technologies and practices if they see their peers doing the same, as this can provide social proof and reduce the perceived risk of experimentation. According to farmers opinions, the use of any agricultural innovation increases effectiveness in their farm ($\bar{x}$ = 3.68). This suggests that farmers believe that new technologies and practices can help to increase their productivity, reduce costs and improve the quality of their produce. They may have had positive experiences with previous innovations or seen the benefits of innovation in the farms of their peers. Policy makers have acknowledged that farmers' responses to changes in agricultural policy are influenced in part by their attitudes and mindsets. The implication here is that the attitudes and mindsets of farmers play a role in shaping how they react to shifts or modifications in agricultural policies. This understanding is crucial for policymakers as they design and implement changes, recognizing that the success and acceptance of new policies may hinge, at least in part, on aligning them with the attitudes and beliefs of the farming community. Furthermore, farmers' attitudes can be more positive when they possess knowledge about diversification, make informed choices regarding suitable technologies, and receive financial support to maximize returns while minimizing risks (Adegebo et al., 2016).

Table 3. Farmers' attitude towards agricultural innovation.

Statements	S	D	U	A	S	Mean
I always wish to receive information about agricultural innovation	5	8	6	37	44	4.07
I believe that agricultural innovation is better than traditional practices.	5	5	8	41	41	4.08
I will not forgo the traditional varieties no matter the information I hear of any agricultural innovation	37	5	14	21	23	2.88
I am willing to embrace any agricultural innovation provided the innovation is practicalized	3	4	20	48	25	4.28
The uncertainty of not knowing how successful an agricultural innovation will be in the long-term would make me uncomfortable to adopt	22	7	17	28	26	3.29
The use of agricultural innovation increases effectiveness in my farm	1	12	18	56	13	3.68
The use of any new agricultural innovation makes me popular among my peers	25	12	16	24	23	3.08
My farmer friends who use new agricultural innovation influence me to do the same	18	8	20	30	24	3.84
I enjoy reading/listening about the different agricultural innovation currently in use	17	10	9	44	20	3.40
I enjoy discussing about current agricultural innovation currently promoted by extension services	7	11	16	52	14	3.55
I often take my time before making a decision to adopt an agricultural innovation	15	8	19	39	19	3.89
I am always skeptical about new agricultural innovation	19	13	10	36	22	3.29
Friends always use me as a point of reference for new innovations	33	6	17	22	22	2.94
I have keen interest in new agricultural innovations	17	12	17	41	13	3.21
I am always skeptical when it comes to new agricultural innovations	22	10	9	34	25	3.30
I prefer to stick to existing agricultural practices that I am familiar with	39	9	11	22	19	2.73

2.05 is significant.

3.4. Constraints to the Adoption of Drought Tolerant Maize Varieties

Table 4 shows that the major constraints that hindered the respondent from adopting drought tolerant maize varieties were low output of drought tolerant maize varieties ($\bar{x}$ = 2.28). This could be due to lack of compliance with agronomic practices associated with the cultivation of drought-tolerant maize varieties. Next is technicalities of innovation (lack of technical know-how) ($\bar{x}$ = 2.27), this is due to various reasons such as inadequate information on usage and management of drought-tolerant maize varieties and limited access to extension services. Also, non-accessibility of drought tolerant maize varieties ($\bar{x}$ = 2.26). This due to reasons such as limited availability of drought-tolerant maize varieties in local markets, high prices of such varieties, or inadequate distribution channels. Other identified constraints encountered by the maize farmers include: lack of adequate information/warning about drought ($\bar{x}$ = 2.17). This is due to various reasons such as limited access to weather forecasts, inadequate communication channels for disseminating weather information, or low awareness of the risks associated with drought. Farmers unwillingness to adopt drought-resistant maize varieties due to

distrust arising from previous experience ($\bar{x}$ = 2.09). This is due to various reasons such as farmers' bad experiences with previously adopted drought-tolerant maize varieties, poor performance of such varieties, low yield, fragility to pests and diseases, inferior product quality and false promises from seed companies.

Table 4. Constraints to the adoption of drought tolerant maize varieties.

Statement	Major Constraint	Minor Constraints	No constraints	Mean	Ranking
Low output of drought tolerant maize varieties	44	40	16	2.28	1st
Technicalities of innovation (lack of technical know-how)	43	41	16	2.27	2nd
Non-accessibility of drought tolerant maize varieties	44	38	37	2.26	3rd
Lack of adequate information/ warning about drought	37	43	20	2.17	4th
Farmers unwillingness to adopt due to distrust arising from previous experience	27	55	18	2.09	5th
Uncertainty/fear of failure of the drought tolerant maize varieties	32	36	32	2.00	6th
Lacking sufficient skills to adopt the drought tolerant maize varieties	30	36	31	1.96	7th
Inadequate extension agent to provide essential information	26	40	34	1.92	8th
Socio-cultural limitation to the adoption of drought tolerant maize varieties in my locality	20	45	35	1.85	9th

Major constraint = 3, Minor constraint =2, No constraint =1.

3.5. Factors Influencing Farmers' Attitude to Adopt Agricultural Innovation

Logit regression analysis indicated that the model holds statistical significance, underscoring its efficacy in predicting farmers' attitudes toward agricultural innovation (Table 5).

Sex: An exploration of the analysis revealed that the coefficient for sex (male = 1, female = 0) was estimated at 1.398 (SE = 0.585). This estimate was accompanied by a Wald chi-square statistic of 5.716, yielding a p-value of 0.017. The odds ratio for sex was determined to be 4.043 (95% CI: 2.054-6.924), suggesting that male farmers were notably more inclined to exhibit a positive attitude toward agricultural innovation compared to their female counterparts. This gender-based distinction significantly influenced farmers' attitudes toward agricultural innovation.

Income: The coefficient pertaining to income was observed to be 0.000 (SE = 0.000). This coefficient resulted in a Wald chi-square statistic of 5.025 and a corresponding p-value of 0.025. The odds ratio for income was computed as 1.000, indicating that with each unit increase in income, the odds of adopting a favorable attitude toward agricultural innovation increased by approximately 2.5%. The effect of income on farmers' attitudes was statistically significant, reinforcing its role as a contributing factor.

These findings are in agreement with the findings of Adarkwa et al., (2017), that male farmers exhibited a higher propensity for embracing agricultural innovations compared to their female counterparts, while farmers boasting elevated income levels demonstrated a greater likelihood of adopting these advancements. Furthermore, research revealed that farmers who had undergone training in agricultural innovations exhibited a heightened inclination toward their adoption (Adarkwa et al., 2017).

Non-Significant Predictors: In contrast, the predictor variables of age, marital status, farm size, and years of farming experience exhibited no substantial impact on farmers' attitudes toward agricultural innovation.

Model Fit: The Nagelkerke R^2 value of 0.226 for the model indicates that approximately 22.6% of the variance observed in farmers' attitudes toward agricultural innovation can be attributed to the variables integrated into the model.

Table 5. Factors influencing farmers' attitude to adopt agricultural innovation.

Variable	Coefficient	SE	Wald	p-value
Sex (male =1, female =0)	1.398	0.585	5.716	0.017
Income	0.000	0.000	5.025	0.025
Age	-0.048	0.031	2.394	0.122
Farm size	-0.756	0.487	2.412	0.120
Years of Farming Experience	-0.035	0.058	0.362	0.548
Level of Education	-0.823	1.445	0.325	0.569

3.6. Test of Hypotheses

Two hypotheses were tested in this study and were stated in null form at 0.05% level of significance.

H_{01}: There is no significant relationship between farmer's socio-economic characteristics and Farmers attitude to adopt Agricultural innovations. The result of the Pearson correlation analysis presented in Table 6 indicates that there is a statistically significant relationship between level education and Farmers attitude to adopt Agricultural innovations, p-value <0.05. While there is no significant relationship between other selected socio-economic characteristics and farmers' attitude towards agricultural Innovation.

Table 6. Correlation analysis of relationship between the socio-economic characteristics and farmers attitude to adopt agricultural innovations.

Socio-economic characteristics/ farmer's attitude to adopt Agricultural innovation	Correlation Coefficient	P-Value	Decision
Age	-0.181	0.071	NS
Household size	-0.109	0.280	NS
Level of Education	0.200	0.046	NS
Farm Size	0.027	0.787	NS
Years of Farming Experience	-0.082	0.419	NS

Correlation is significant at the level 0.05(1-tailed). NS: Not significant.

H_{02}: There is no significant relationship between farmers' level of awareness on drought tolerant maize varieties and farmers attitude to adopt Agricultural innovation.

Table 7 presents the results of Chi-square analysis to show relationship between the level of awareness on drought maize tolerant varieties and farmers attitude to adopt Agricultural innovation. Statistically, there is a significant relationship between the level of awareness on drought tolerant maize varieties and farmers attitude to Agricultural innovation ($p < 0.05$). This implies that farmers who are more aware of drought maize tolerant varieties as Agricultural innovation, have a positive attitude towards adopting them. This is because awareness help farmers to understand the benefits of drought tolerant maize varieties as Agricultural innovation and to see how they can help them to improve their yields and incomes in drought-prone areas.

Table 7. Chi-square analysis of relationship between farmers level of awareness and farmers attitude to adopt agricultural innovation.

Hypothesis	Chi-Square value (χ^2)	Sig. Value	Decision
There is no significant relationship between farmers level of awareness on drought tolerant maize varieties and farmers attitude to adopt agricultural innovation	100.000	0.000	Significant

4. Conclusion

The study's results indicate a noteworthy gap in farmers' awareness when it comes to comprehending the advantages and features of drought-tolerant maize varieties. A significant portion of farmers exhibited a lack of understanding regarding the qualities and benefits associated with the drought tolerant maize varieties. Several impediments to the actual adoption of these varieties were identified. These challenges encompassed issues such as low output of drought-tolerant maize varieties and the technical complexities related to their integration into farming practices due to a lack of requisite technical expertise. The research also highlighted the substantial impact of two key factors, namely, (sex and income) on farmers' decisions regarding the adoption of drought-tolerant maize varieties. These factors emerged as pivotal influencers in shaping the inclinations and choices of maize farmers towards adopting drought tolerant maize varieties. Level of education and level of awareness was correlated.

Based on the findings of the study on factors influencing farmers' attitude to adopt drought-tolerant maize varieties in Ondo State, Nigeria, the following recommendations are suggested:

1. Farmers maize output was low probably due to high effects of increased pest and diseases and drought. High yielding drought tolerant varieties could be massively deployed to drought prone area. This would go a long way in improving the low yield of maize production in the study area.

2. Level of awareness for drought tolerant maize varieties was very low. It is therefore recommended that information constraints by agricultural extension services / information dissemination services in the state, should be strengthened to increase farmers' awareness of the benefits of drought-tolerant maize varieties. This can be achieved through targeted awareness campaigns and training programs.

3. Maize farmers were saddled with so many maize production constraints all of which were either: socio-economic, institutional and technological factors. These could

be avoided through appropriate policies and better research approaches which will be critical to the future of maize producers and of the maize industry in Nigeria.

4. Getting appropriate feedback on farmers technology adoption behavior is crucial in designing a well-tailored intervention that could result in rationalizing scarce resources required for used by stakeholders in agricultural sector of the economy to avoid misappropriation of financial resources to develop varieties that would not be adopted by the end users.

5. The government and agricultural development organizations should work together to provide access to extension services to farmers in Ondo State, Nigeria.

Conflict of Interest

The authors declare that they have no conflict of interest.

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