PRIMARY RESEARCH

Acceptance of Agricultural *Takāful* Among Crop Farmers in Yobe State, Nigeria

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Abstract.

Purpose: The primary aim of this research is to examine the elements that influence the acceptance of agriculture *takāful* among crop producers in Yobe State. To achieve this, the study will focus on several specific objectives, including evaluating the impact of awareness, attitude, perceived behavioral control, and subjective norms on the acceptance of agricultural *takāful* among crop farmers in Yobe state.

Methodology: The study employed descriptive analysis using frequencies, percentages and inferential statistics using structural equation model as technique of data analysis. In this study, the data was analyzed by using software packages for social science, namely SPSS version 22, and AMOS version 21.

Findings: The result shows that; awareness of crop farmers towards agricultural *takāful* in Yobe State was positive and statistically not significant. While attitude, perceived behavioral control and subjective norms of crop farmers in the study area was positive and statistically significant.

Research Limitations/Implications: This study focuses solely on exploring the farmers' willingness to adopt agricultural *takāful* in Yobe state, specifically within the Damaturu local government area. The research exclusively relies on primary data obtained from participants through questionnaires. The reason for using this approach is that crop farming constitutes a significant portion of the economic activities in the study area.

KAUJIE Classification: I44, V12
JEL Classification: Q19, D19

INTRODUCTION

Agriculture is inherently characterized by high economic risks. According to Kumari et al. (2017), unforeseen events such as floods, plant disease infections, heavy rainfall, and droughts can lead to substantial losses in the agriculture sector. Additionally, Ullah et al. (2016) have identified two major types of risks in agriculture. The first type is business risk,

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which encompasses production risk relating to the possibility of farmers experiencing lower yields or outputs than projected. Market risk involves uncertainty surrounding commodity prices and the potential for adverse price changes that may impact the farmers. Institutional risk, on the other hand, is associated with uncertainties stemming from government actions. Moreover, personal risk involves factors like human health or personal relationships that can influence the farm business. The second type of risk is financial risk, arising from the various methods of financing the farm business. This risk can be triggered by the uncertainty regarding fluctuation of interest rates in future, the ability and willingness of lenders for providing funds when needed, and the farmer's ability to generate sufficient income for loan repayment. Agricultural *takāful* serves as a risk-sharing mechanism, offering an alternative to conventional insurance for global risk coverage. Rooted in the principles of social solidarity, cooperation, and mutual support among its members, this system entails a contract wherein a group of individuals agrees to collectively indemnify each other against crop loss or damage. Members contribute funds collectively through the concept of Tabarru, which involves voluntary donations for the benefit of others. Through this mutual sharing of losses, the element of absolute uncertainty in determining contributions is eliminated, as highlighted by Al-Salih & Holloway (2014).

Islam encourages the adoption of precautionary measures to mitigate risks. An example of this guidance can be found in chapter 12, verses 47 to 48, of the Holy Qur'ān, where Prophet Yusuf (Alaihi Salam) advised storing surplus grain during seven years of good harvest as a safeguard to ensure a continuous food supply during seven years of drought. This demonstrates the importance of proactively avoiding misfortune while being prepared for any eventualities.

Takāful, in line with this principle, aims to foster shared responsibilities and mutual cooperation among its participants. Its primary objective is to protect individuals from unforeseen risks, emphasizing the value of collective support and assistance among the involved parties. By following these principles, individuals can strive to secure their well-being and be prepared to face uncertainties.

The agricultural sector in Yobe state is facing significant challenges in meeting the rising food demand caused by its growing population. Crop farmers in the study area encounter numerous issues, leading to low productivity levels. The predominant agricultural practices in the region rely on rain-fed cultivation, and most farmers are involved in small-scale subsistence farming. The major food crops cultivated include millet, sorghum, cowpea, and maize, while cash crops comprise gum Arabic, groundnut, sesame seed, and cotton.

Yobe State is one of the regions severely impacted by drought and is recognized as one of the nine drought and desertification frontline states in Nigeria (Olagunju, 2015). The study area, in particular, faces the challenge of drought, significantly reducing the productivity and attractiveness of agriculture, which serves as the primary occupation for over 80 percent of the 2.3 million population in Yobe (YSSYB, 2019). Additionally, large-scale farmers in the area are contending with the issue of flash floods, as exemplified in Gashua, where the 2019 flood caused substantial crop destruction and hindered them from cultivating to their full capacity.

In addition; high temperature, incidence of locust and pests' outbreaks also aggravated the productivity of farmers at harvest level, whereby; it physically caused damage to their crops and harms agricultural productivity through feeding on crops and parasitizing it (Salleh et al., 2021). Finally, the ban on operations of motorcycle for both commercial and other purposes in about five major towns in the State, have seriously affected farmers to continue their farming activities (Adebisi et al., 2016).

To the best of the researcher's knowledge, only few studies focused on agricultural *takāful* such as Abbas et al. (2017); Aziz et al. (2017); Magami et al. (2014), all of the researchers cited found that farmers in their study locations were more likely to adopt *takāful* coverage. The fact that these investigations were carried out outside of Nigeria, however, leaves a gap in the literature regarding the acceptance of agricultural *takāful* among crop growers in Yobe state.

The present study used awareness, attitude, perceived behavioral control, and subjective norms as independent variables, each with five measuring items, to fill this knowledge gap. In addition, six corresponding latent indicators were used to measure the dependent variable, which was the acceptance of agriculture *takāful*. This study hopes to accomplish this by offering insightful information about the acceptability of agricultural *takāful* in the setting of Yobe.

LITERATURE REVIEW

Abi Huraira & Jahan (2021) investigates the factors influencing the intention of paddy's farmers to participate in Agriculture *takāful* in Sri Lanka. The study's main goal was to look into the motivations and viewpoints of paddy farmers with regard to their participation in *takāful*. To do this, the authors use a case study methodology to collect data from a sample of Sri Lankan paddy farmers by giving them a structured questionnaire. They analyze the responses using statistical techniques to examine the relationship between various factors and farmers' intention to participate in Agriculture *takāful*. The findings of the study suggest that farmers' intention to participate in *takāful* is influenced by several factors, including their knowledge and awareness of *takāful*, perceived benefits, trust in *takāful* operators, and perceived ease of use. The study highlights the value of raising knowledge of *takāful* and providing educational programs in order to increase farmers' understanding of and readiness to accept this Islamic insurance mechanism. The authors also consider how their conclusions may be applied in practice by policymakers, *takāful* business owners, and other players in the agriculture industry. They emphasize the need for targeted awareness campaigns, tailored products, and simplified processes to encourage farmer participation in Agriculture *takāful* in Sri Lanka. Overall, the research article provides valuable insights into the factors which affect the paddy farmers' intention for participating in the Agriculture *takāful* in Sri Lanka. This study improves our understanding of the potential barriers and prospects connected to *takāful* adoption within the Sri Lankan agriculture sector by using a case study technique and statistical analysis. The new information can serve as a springboard for further study and the development of tactics to encourage paddy farmers to participate in *takāful*. In the end, these initiatives may result in enhanced risk management and monetary security in the agricultural

industry.

Salleh et al. (2021) focuses on the development of a *wafāq* Crop Micro *takāful* framework using crowdfunding-*wafāq* in Malaysia. The authors' goal is to present a thorough framework that combines the concepts of Crop Micro *takāful*, crowdfunding-*wafāq*, and *wafāq* (Islamic endowment) to provide financial stability to small-scale farmers in Malaysia. They examine the advantages and beneficial interactions that could result from the fusion of these ideas. The paper provides a comprehensive overview of each component, explaining the principles of *wafāq*, the concept of Crop Micro *takāful*, and the mechanism of crowdfunding-*wafāq*. It highlights the potential of *wafāq* as a sustainable resource for agricultural risk management and the advantages of crowdfunding-*wafāq* in mobilizing community support and resources. The authors then present their proposed framework, outlining the key elements and the role of different stakeholders. They discuss the potential challenges and limitations of implementing such a framework and suggest strategies to address them. While the paper provides an interesting conceptual framework, it lacks empirical data or case studies to support its claims. Additionally, the paper's limited length within conference proceedings may restrict the depth of analysis and discussion. Nonetheless, the research contributes to the exploration of innovative approaches in agricultural risk management through the integration of *wafāq*, Crop Micro *takāful*, and crowdfunding-*wafāq*. The proposed framework opens up avenues for further research and practical implementation, potentially benefiting small-scale farmers in Malaysia by providing them with accessible and Sharia-compliant financial protection. Overall, the paper serves as a starting point for future discussions and investigations into the practical viability and effectiveness of the proposed *wafāq* Crop Micro *takāful* framework through crowdfunding-*wafāq* in Malaysia.

Rifas et al. (2021) focuses on exploring the factors influencing paddy farmers' intention to participate in Agriculture *takāful* in Sri Lanka. The study applies the Theory of Planned Behavior (TPB) as a framework to understand farmers' attitudes and behavioral intentions towards *takāful* participation. The authors utilize a quantitative research approach and collect data through a structured questionnaire administered to paddy farmers in Sri Lanka. They analyze the responses using statistical techniques, including regression analysis, to examine the relationships between farmers' beliefs, attitudes, subjective norms, perceived behavioral control, and their intention to participate in Agriculture *takāful*. The findings of the study indicate that farmers' attitudes towards *takāful*, subjective norms, and perceived behavioral control significantly influence their intention to participate. The research highlights the importance of promoting positive attitudes towards *takāful*, creating awareness about its benefits, and enhancing farmers' perceived control over participating in *takāful* programs. By using the TPB paradigm to examine Agriculture *takāful* in its particular context, the research adds significantly to the body of knowledge already available. The study provides useful insights into the elements that affect farmers' aspirations to take part in *takāful* through empirical observations. The study offers a thorough and nuanced explanation of the factors influencing *takāful* adoption among paddy farmers in Sri Lanka by taking into account their beliefs, societal influences, and sense of control. Additionally, incorporating qualitative research methods could have enriched the study by capturing the farmers' perspectives and

experiences in greater depth. Overall, the article offers valuable insights into paddy farmers' intention to participate in Agriculture *takāful* in Sri Lanka, employing the TPB framework as a theoretical lens. The findings contribute to the understanding of the socio-psychological factors influencing *takāful* adoption and can inform the development of targeted interventions to promote *takāful* participation among paddy farmers, ultimately enhancing risk management and financial protection in the agricultural sector.

Hydara (2020) explores an integrated model that combines *wafāq*, *wafāq* (voluntary charity), and *takāful* to empower women farmers and alleviate poverty in rural Gambia. The article is published in the Journal of Islamic Finance. The author focuses on addressing the socio-economic challenges faced by women farmers in rural Gambia, emphasizing their vulnerability to poverty and limited access to financial resources. The paper proposes an integrated model that utilizes *wafāq*, *wafāq*, and *takāful* as mechanisms to provide financial support and empower these women farmers. The article provides a comprehensive analysis of each component, explaining the principles and benefits of *wafāq*, *wafāq*, and *takāful* within the context of poverty alleviation. It highlights the potential of these Islamic finance tools to create sustainable and community-driven solutions. The author presents a conceptual framework that integrates these three elements, outlining their roles and interactions in supporting women farmers. The framework emphasizes the importance of community participation, capacity-building, and education to ensure the effectiveness and sustainability of the proposed model. While the article offers an insightful perspective on addressing poverty and empowering women farmers in rural Gambia, it would benefit from more empirical evidence or case studies to validate the proposed model's feasibility and impact. Additionally, a more in-depth analysis of the challenges and potential limitations of implementing such a model could provide a more comprehensive understanding. Overall, the article contributes to the discourse on poverty alleviation and women's empowerment in rural communities through the integration of *wafāq*, *ṣadaqah*, and *takāful*. It provides a basis for further research and practical initiatives that explore the implementation and effectiveness of the proposed integrated model.

Adesoji et al. (2017) conducted a survey to evaluate the awareness and participation levels of fish farmers in agricultural insurance, aiming to enhance these levels. They employed a survey method and selected 295 respondents from a total of 1,728 registered fish farmers in Ondo state. The researchers observed that the majority of fish farmers were literate, married, and had children. Approximately 70% of them were aware of agricultural insurance schemes, but only 15% had taken fish insurance cover in the last five years. Despite the high level of insurance awareness, the actual participation in insurance was significantly low.One limitation of this study is that it did not consider *takāful* (Islamic insurance) as an alternative option, even though 55% of the Ondo population are Muslims. This could be a reason why the participation level in conventional insurance was low in the study area. The findings of the study may have been more relevant if *takāful* had been included as an insurance option for fish farmers in the area.

In a study conducted by Ellis et al. (2017), a dichotomous contingent valuation method was utilized to assess the willingness to pay for crop insurance among cereal farmers in the eastern

province of Ghana. The primary data was collected from 208 sampled farmers in the study area and analyzed using descriptive statistical techniques. The results showed that 52.9% of the sampled farmers expressed interest in crop insurance. To estimate the mean willingness to pay for crop insurance, Ellis employed the probit model, and a Heckman two-stage approach was used to identify the factors influencing this willingness. The empirical findings from the probit model indicated that factors such as marital status, education, access to extension services, crop type, borrowing behavior, savings habits, and awareness of crop insurance significantly influenced the farmers' willingness to purchase insurance coverage. While Ellis's study is valuable, it is important to note that it was based on conventional principles that may conflict with certain elements of Islamic Shari'ah law. As such, the study could have been even more relevant if it had applied a Shari'ah-compliant form of insurance cover to align with Islamic principles.

In a study conducted by Abbas et al. (2017), an investigation was made into the demand for livestock *takāful* (Islamic insurance) in Punjab province, Pakistan.-scaleinflThe study findings indicated that the willingness of livestock owners to pay for livestock *takāful* was influenced by factors such as the number of animals, animal quality, herd strength, and farm income. Specifically, 85.2% of farmers expressed their willingness to increase their herd strength, while only 14.8% opposed this trend. Likewise, 89.6% of farmers intended to improve their herd quality, while 11.4% were not interested in doing so. Furthermore, the research revealed that 58% of respondents were willing to participate in Islamic livestock *takāful*, while 42% were not willing to participate. It's important to note that this study specifically focused on livestock *takāful* in Pakistan. As a result, there is a need for similar research to be conducted, concentrating on the crop farming sub-sector of agriculture in Nigeria, particularly in Yobe state.

Falola et al. (2013) conducted a study to investigate the willingness of cocoa farmers in Nigeria to take up agricultural insurance. The research involved a three-stage sampling procedure, leading to the selection of 150 cocoa farm households. Data was collected from the respondents using a structured questionnaire, and the analysis was performed through descriptive statistics and a probit regression model. The study revealed that 77.5% of the farmers in the study area were aware of agricultural insurance, but only 50% were actually eager to opt for it. Factors such as the age of the household head, educational level, access to extension services, and farm income were identified as significant variables influencing the farmers' willingness to embrace agricultural insurance in the study area. However, it is essential to acknowledge that the study's scope was limited to Ondo state of Nigeria, which comprises over 18 local governments. Consequently, the sample size of 150 cocoa farmers might have been more valuable if it were larger and more representative. Moreover, the findings could have been enhanced by using *takāful* (Islamic insurance) instead of conventional insurance in the study. This would have catered to the needs and preferences of those who adhere to Islamic principles.

RESEARCH METHODOLOGY

Study Design

A causal research design has been used in this study, this research design is used to determine cause-and-effect relationships between variables. The design is best suited for this study because it aims at finding out the prevalence effect of awareness, perceived behavioral control, and subjective norms of the respondents on dependent variable attitude. Thus, the study is cross sectional in nature that is; data had been collected at a certain point of time.

Sample Size and Sampling Technique

The study population comprises all large as well as small scale crop farmers in Yobe State. As obtained from the state agricultural development program office, the number of large-scale farmers as at December 2021 was 2,963 and 37,204 small scale farmers making a total number of 40,167 to be the population of the study. According to (Krejcie & Morgan, 1970), 386 can stand as sampling size of a population of one million. For that reason, for the sake of this study; 386 crop farmers are taken as the sample size. Judgmental sampling technique is used to administer questionnaire to both large- and small-scale farmers in Damaturu local government of Yobe state because; my respondents have a specific characteristic to measure.

Study Instrument

The study used only Primary data. Primary data has been collected from the crop farmers in the study area through the use of a structured questionnaire. The questionnaire has been categorized into 2 sections. Section (A) covers demographic information of the respondents while. While section (B) measured the acceptability of agricultural *takāful* among crop farmers in line with theory of planned behavior (TPB) with four predictors namely, awareness, attitude, perceived behavioral control and subjective norms. The questionnaire consists of 20 questions that measured four independent variables whereas 6 question measured the dependent variable.

Method of Analysis

The study utilized two types of data analysis: descriptive analyses, employing frequencies and percentages, and inferential statistics using Structural Equation Modelling (SEM). SEM was chosen as the data analysis technique because it is a robust statistical method suitable for the multivariate analysis by using the latent variables. This technique involves a set of linear equations to test hypotheses about the relationships between latent and observed variables, utilizing a confirmatory approach. SEM is commonly employed in various disciplines, including the social sciences, and is particularly useful for confirmatory studies. To carry out the analysis, the study utilized both SPSS (version 22) and Amos (version 21) software to process and interpret the data.

RESULTS AND FINDINGS

Data Analysis
Descriptive Analysis

The descriptive analysis section commences by outlining the demographic characteristics of the study's respondents. Additionally, this section provides the descriptive statistics for the study's constructs.

Socio Economic Factors of the Respondents

The survey questionnaire comprises six demographic questions related to respondents' gender, age, religion, marital status, qualification, and occupation. A total of 386 respondents received the questionnaire. This section presents a summary of the general frequency distribution of respondents' characteristics, as displayed in Table 1.

TABLE 1
Respondents Profile

	Frequency	Percent	Valid percent	Cumulative percent
Gender				
Male	367	95.1	95.1	95.1
Female	19	4.9	4.9	100
Total	386	100	100	
Age				
20-29	28	7.3	7.3	7.3
30-39	91	23.6	23.6	30.8
40-49	113	29.3	29.3	60.1
50-59	110	28.5	28.5	88.6
60 Above	44	11.4	11.4	100
Total	386	100	100	
Religion				
Muslim	359	93	93	100
Non-Muslim	27	7	7	7
Total	386	100	100	100
Marital Status				
Single	56	14.5	14.5	14.5
Married	326	84.5	84.5	99
Widow	4	1	1	100
Total	386	100	100	
Qualification				
No Formal Education	51	13.2	13.2	13.2
Below Secondary School	46	11.9	11.9	25.1
Secondary School	55	14.2	14.2	39.4
Diploma	122	31.6	31.6	71
Bachelor's Degree	108	28	28	99
Master's / PhD's Degree	4	1	1	100
Total	386	100	100	
Occupation				
FARMING	386	100	100	100

Regarding gender, the Table 1 revealed that 367 of the respondents (95.1%) are males while only 19 (4.9%) are females. From Table 1, the 28 (7.3%) of the respondents are in 20-29 age group. While 30-39 age bracket consist of 91 (23.6%) of the respondents, 113 (29.3%) within the age group of 40-49, 110(28.5%) of the respondents are within 50-59 bracket, 44 (11.4%) of the respondents are within above 60, it shows that most of the respondents are farmers having age between 40-49 with 29.3% and follows by 50-59 age group with 28.5%. In terms of religion, 359 (93%) of the respondents are Muslims while 27 (7%) were non-Muslims. In term of marital status 56 (14.5%) of the respondents are single, 326 (84.5%) of people are married and only 4 (1.0%) are widow. The above Table 1 reveals that 51 (13.2%) of the respondents obtained no formal education, while 46 (11.9%) of the respondents held below secondary school certificate, while 55 (14.2%) of the subjects obtained secondary certificate and 122 (31.6%) of the respondents obtained diploma certificate, 108(28.0%) obtained Bachelor degree while only 4 (1%) obtained masters/PhD certificate.

TABLE 2
KMO and Bartlett's Test

Attitude		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.67
Bartlett's Test of Sphericity	Approx.Chi-Square	493.502
	Df	10
	Sig	0.000
Awareness		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.842
Bartlett's Test of Sphericity	Approx.Chi-Square	2599.995
	Df	10
	Sig	0.000
Perceived behavioral control		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.651
Bartlett's Test of Sphericity	Approx.Chi-Square	888.309
	Df	10
	Sig	0
Subjective Norms		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.757
Bartlett's Test of Sphericity	Approx.Chi-Square	539.942
	Df	10
	Sig	0
Acceptance		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.605
Bartlett's Test of Sphericity	Approx.Chi-Square	1419.778
Df 15		
Sig 0		

This clearly shows that majority of the subjects got at least of secondary certificate and follows by bachelor degree. The above Table 1 indicates that 386 (100%) of the respondents are farmers and this signifies that all the subjects are farmers by occupation.

Result of Exploratory Factor Analysis (EFA)

In this section, the discussion on the results of the EFA are conducted in order to assess the suitability of the instruments used in the study.

According to the results presented in Table 2, the Attitude, awareness, perceived behavioral control, subjective norm and acceptance EFA demonstrates a high value of 0.670, 0.842, 0.651, 0.757 and 0.605 respectively for the KMO. This suggests that the research data is well-suited for structure detection, indicating the proportion of variance in the items that can be attributed to underlying factors (Hair et al., 2006). Thus, the data is deemed appropriate for factor analysis. Furthermore, the significance of Bartlett's test of sphericity for Attitude, awareness, perceived behavioral control, subjective norm and acceptance (χ^2: 493.502, p-value ¡ 0.000; 2599.995, p-value < 0.000; 995.2355, p-value < 0.000; 539.942, p-value < 0.000 & 1419.778, p-value < 0.000) respectively, this confirms that all the variables are not unrelated, making them suitable for structure detection (Awang, 2014). The next step is running confirmatory factor analysis procedure.

Reliability Test

The findings reveal that all constructs have Cronbach's Alpha reliability coefficients exceeding 0.6. Overall, Table 4 demonstrates that the internal consistency reliability of the variables utilized in this study is considered strong and excellent.

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TABLE 3
Result of the Reliability Statistics of the variable of the Study
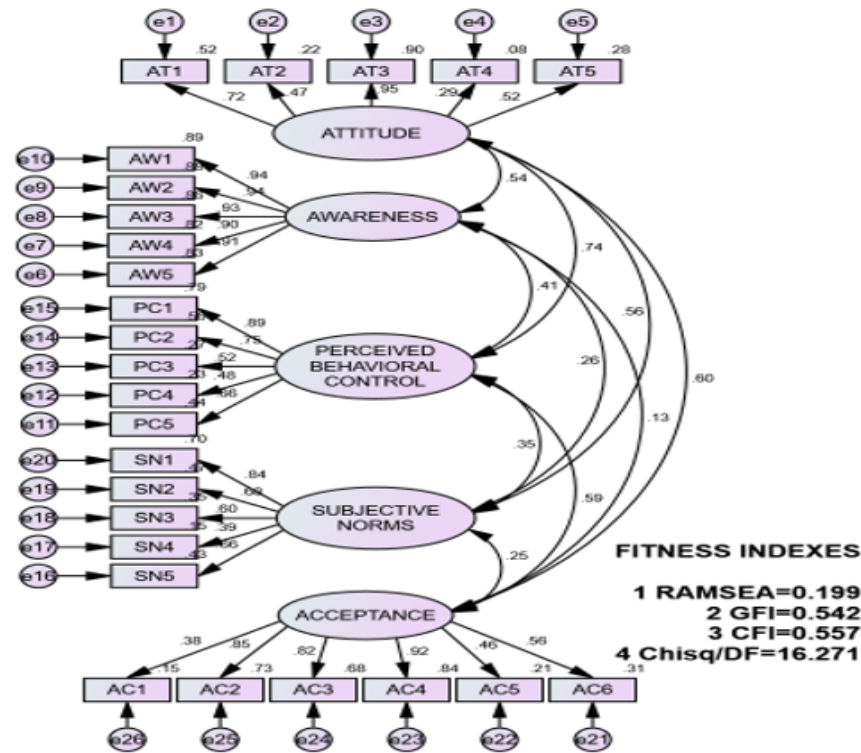
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Construct	Number of items in construct	Cronbach's Alpha
Attitude	5	0.659
Awareness	5	0.966
Perceived behavioral control	5	0.798
Subjective norms	5	0.770
Acceptance	6	0.843

Confirmatory Factor Analysis Unidimentionality and Validity of the Measurement Model

Confirmatory factor analysis enables the evaluation of the unidimensionality, validity, and reliability of a latent construct before exploring its interrelationships in a structural model. Consequently, it serves as a validation procedure for the measurement model of the latent construct.

The primary aim of this study is to employ SEM in investigating the impact of attitude, awareness, perceived behavioral control, and subjective norms on acceptance.

The examination of the overall fit of the measures is based on four indexes. Additionally, parameter estimates are scrutinized to ensure their correct direction and reasonable magnitude. Moreover, latent factor correlations and factor determinacies are inspected. Finally, standardized residuals are analyzed to identify any aspects of the model that may not fit the data well (DiLalla, 2000; Emmioğlu, 2011). Figure 1 illustrates the tested measurement model.

FIGURE 1. Confirmatory Factor Analyses (Measurement Model)

There are two models involved in dealing with AMOS version 21 which are measurement and structural models. In the measurement model, the researcher is using twenty-six measuring items as parameters. However; in the case of reliability test, the researcher used internal consistency approach through Cronbach Alpha value of greater than 0.60. Therefore, in figure 1, the factor loading given above having value of 0.60 except AT4 with a value of 0.29, SNs4 with a factor loading of 0.39 and AC4 with a value of 0.38 that need to be deleted before moving further. But it should be noted that, the deletion should not be above 30% of the items in a construct. This resulted to getting a new measurement model with 23 dimensions subsequently.
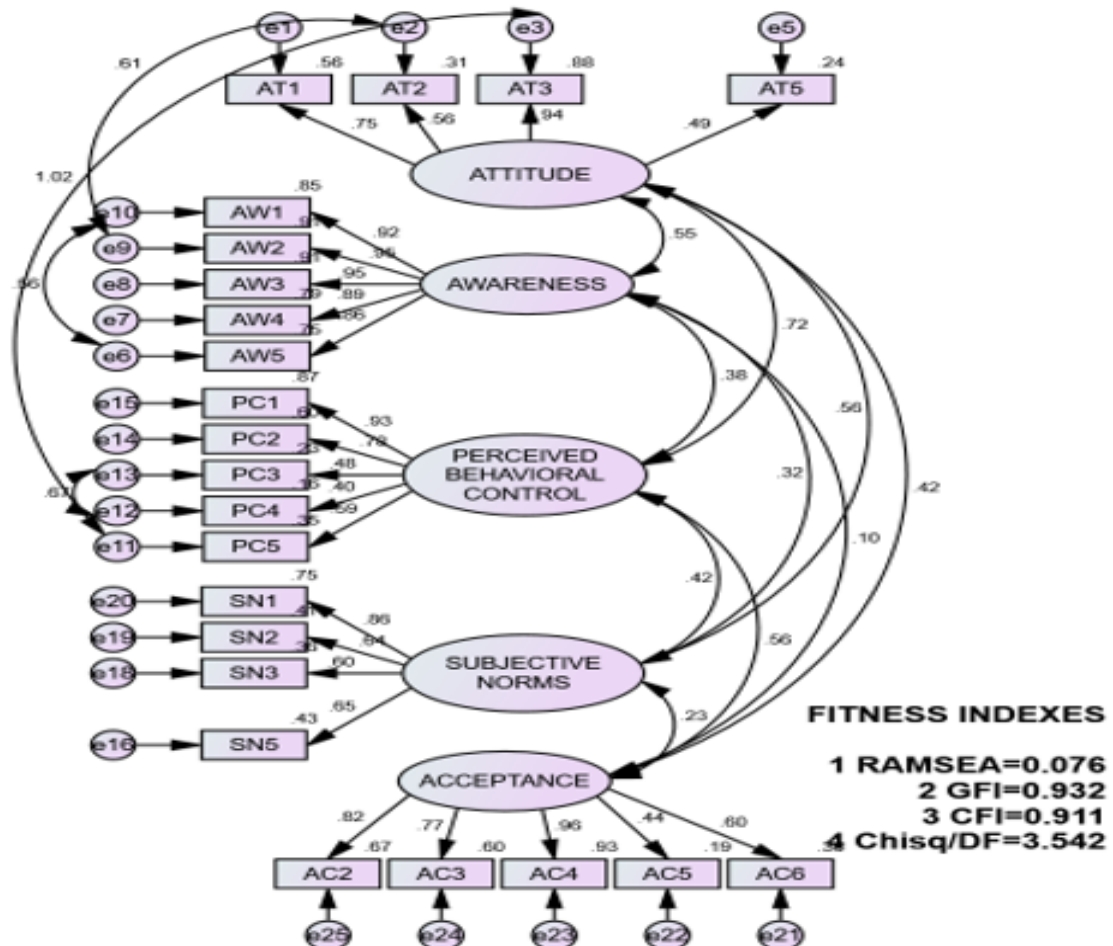
TABLE 4
The Fitness Indexes for Measurement Model

Name of Category	Name of Index	Index Value	Comments
Absolute Fit	RMSEA	0.199	The Required Level is not Achieved
	GFI	0.542	The Required Level is not Achieved
Incremental Fit	CFI	0.557	The Required Level is not Achieved
Parsimonious Fit	Chisq/df	16.271	The Required Level is not Achieved

The CFA results indicate that the model did not meet the criteria for further analysis. The

fitness indexes for all the constructs fell below the required level, and the proposed model did not adequately fit the data. The assessment of the measurement model did not provide strong evidence of unidimensionality, convergent validity, and discriminant validity. To improve the fitness indexes of the measurement model, a modification is necessary. Specifically, we will remove the three-factor loadings that are less than 0.60. The modified model is shown in Figure 2.

The New Measurement Model

FIGURE 2. The New Factor Loading after three items with low factor loading were deleted (The New Measurement Model).

TABLE 5
The New Fitness Indexes for Modified Measurement Model

Name of Category	Name of Index	Index Value	Comments
Absolute Fit	RMSEA	0.076	The Required Level is Achieved
	GFI	0.932	The Required Level is Achieved
Incremental Fit	CFI	0.911	The Required Level is Achieved
Parsimonious Fit	Chisq/df	3.542	The Required Level is Achieved

Note: The fitness index has improved after the modification has taken place in the measurement model.

Figure 2 is a new measurement model indicating a new factor loading after modifying the first measurement model. This result is shown after deleting three items of AT4 with a value of 0.29, SN4 with a value of 0.39, and AC1 with a factor loading of 0.38 in which all the three items are below the recommended Cronbach Alpha value of 0.60 and above.

Based on Figure 2 and Table 5, the CFA results reveal the following fitness indexes: RMSEA = 0.076, GFI = 0.932, CFI = 0.911, and *Chisq/df* = 3.542. As depicted in Table 6, these fitness indexes demonstrate that the measurement model fits the data satisfactorily, and all the fitness indexes indicate an adequate fit. Overall, the assessment of the measurement model provides strong evidence of unidimensionality, construct validity, reliability, and discriminant validity. Therefore, we can confidently state that the model is well-fitting and suitable for analysis.

TABLE 6
The Measurement Model Results for Each Construct (After Modification)

Construct	Items	Factor loading	Cronbach's Alpha	C.R.	AVE
			(Above 0.70)	(Above 0.60)	(Above 0.50)
Attitude	AT1	0.75	0.721	0.79	0.5
	AT2	0.56			
	AT3	0.94			
	AT5	0.49			
Awareness	AW1	0.92	0.966	0.962	0.837
	AW2	0.95			
	AW3	0.95			
	AW4	0.89			
	AW5	0.86			
Perceived behavioral control	PC1	0.93	0.798	0.784	0.543
	PC2	0.78			
	PC3	0.48			
	PC4	0.4			
	PC5	0.59			
Subjective Norms	SN1	0.86	0.778	0.785	0.503
	SN2	0.64			
	SN3	0.6			
	SN5	0.65			
Acceptance	AC2	0.82	0.846	0.851	0.548
	AC3	0.77			
	AC4	0.96			
	AC5	0.44			
	AC6	0.6			

Based on the data presented in Table 6, the model exhibits satisfactory measurement properties for each single factor, as evident from its Cronbach's Alpha, Composite Reliability, and Average Variance Extracted values. Therefore, based on these results, we can affirm that the model is well-suited for further analysis. Additionally, some items with low factor loadings and redundant characteristics have been removed as a result of this assessment.
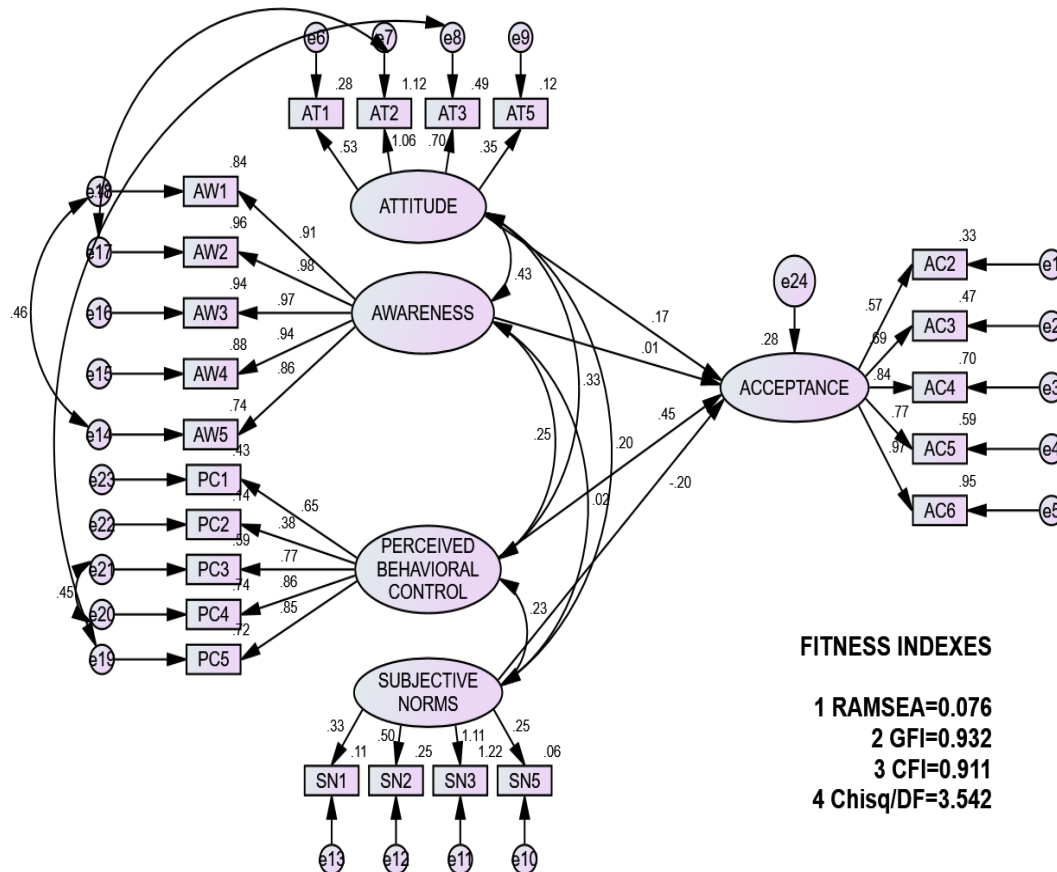
The Assessment of Normality for the Data

Once the fitness indexes have been attained, it is essential to conduct a normality assessment of the data before moving forward with modeling the structural model. Table 7 provides a comprehensive overview of assessment of the normality for each item included in the model.

TABLE 7
The Assessment of Normality Distribution for Items in the Construct

Variable	Min	max	Skew	c.r.	Kurtosis	c.r.
AC2	2	5	-1.623	-13.02	1.3	13.236
AC3	2	5	-1.289	-10.342	1.907	11.658
AC4	2	5	-1.615	-12.958	1.283	13.166
AC5	1	5	-1.654	-13.269	1.912	27.719
AC6	4	5	-0.391	-3.133	-1.847	-7.409
SN1	2	5	-0.1	-8.823	0.598	2.396
SN2	2	5	-0.122	-8.998	0.774	3.104
SN3	2	5	-0.237	-9.924	1.936	7.765
SN5	1	5	-0.309	-10.495	0.704	2.823
PC1	2	5	-0.107	-8.881	1.883	19.581
PC2	2	5	-0.991	-7.951	1.739	10.985
PC3	3	5	0.126	9.031	1.151	8.625
PC4	3	5	0.567	4.545	-0.361	-1.448
PC5	1	5	-0.501	-12.039	1.343	17.419
AW1	1	5	0.323	10.615	0.589	2.363
AW2	1	5	0.118	8.969	0.341	1.369
AW3	1	5	0.17	9.383	0.065	0.261
AW4	1	5	0.221	9.793	0.633	2.538
AW5	1	5	0.29	10.35	0.459	1.84
AT5	2	5	-0.977	-7.839	1.045	12.212
AT3	2	5	-0.207	-9.678	1.051	16.246
AT2	4	5	0.062	0.499	-1.996	-8.005
AT1	1	5	-0.58	-12.674	1.474	9.922
Multivariate					217.479	62.999

According to the findings presented in Table 7, the values of Kurtosis and Skewness fall within the recommended range of -1 to +1 for Skewness and -2 to +2 for Kurtosis. This indicates that the data is normally distributed, and the normality assumption has been satisfied.Given these results, the data is deemed appropriate for further analysis, specifically for conducting Structural Equation Modeling (SEM), or the Structural Model.

Structural Model

FIGURE 3. The Standardized Estimates for Every Path in the Structural Model

TABLE 8
The Standardized Path Coefficients for the Model

Independent Construct	Path	Dependent Constructs	Estimate
Awareness	− − − >	Acceptance	0.01
Attitude	− − − >	Acceptance	0.17
Perceived Behavioural Control	− − − >	Acceptance	0.45
Subjective Norms	− − − >	Acceptance	-0.20

TABLE 9
The Correlation Estimate for Each Pair of Exogenous Construct

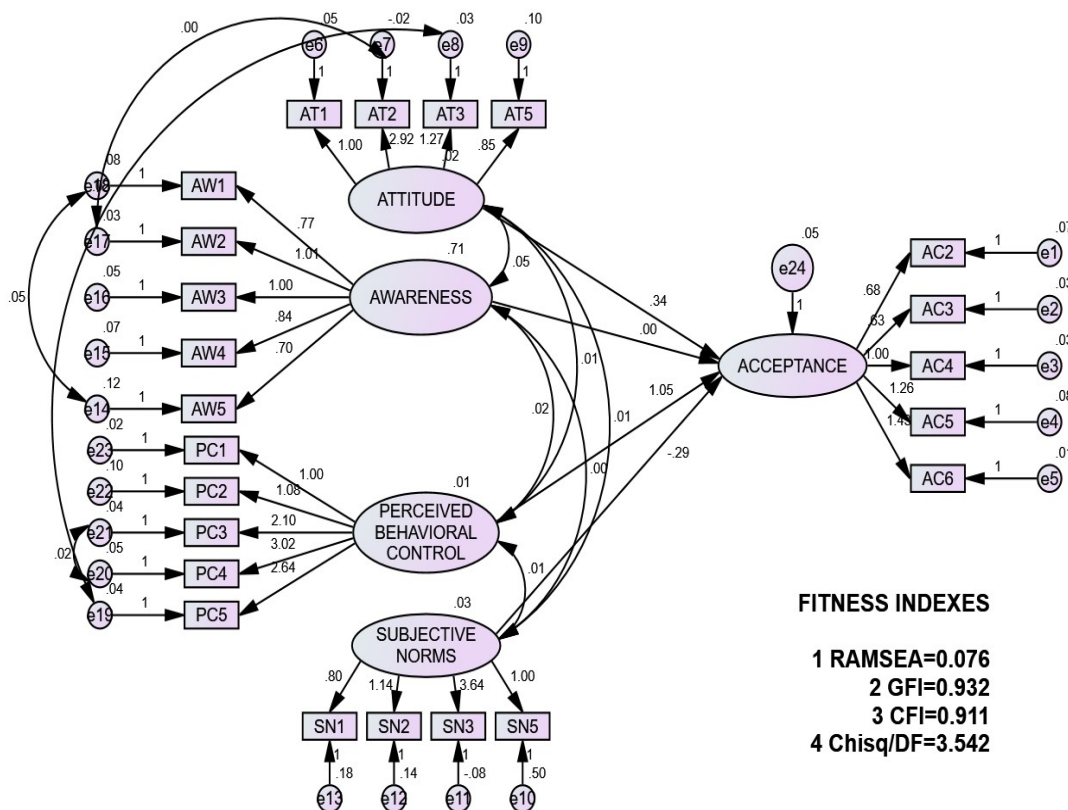| Constructs	Path	Constructs	Estimate correlation
Awareness	< −− >	Perceived behavioural control	0.25
Awareness	< −− >	Subjective norms	0.02
Attitude	< −− >	Awareness	0.43
Attitude	< −− >	Perceived behavioural control	0.33
Attitude	< −− >	Subjective norms	0.2
Perceived behavioural control	< −− >	Subjective norm	0.23

The result in Table 8 indicates that when attitude go up by 1%, acceptance goes up by 0.17%. When awareness goes up by 1%, acceptance goes up by 0.01% and also when perceived behavioral control goes up by 1%, acceptance goes up by 0.45% and lastly when subjective norms go up by 1%, acceptance goes down by 0.20%.

Table 9 displays the estimated correlations between various constructs. The results indicate that there is a correlation of 0.25 between awareness and perceived behavioral control, 0.2 between attitude and subjective norms, and 0.43 between attitude and awareness. Moreover, the estimated correlation between attitude and perceived behavioral control is 0.33, between attitude and subjective norms is 0.20, and between perceived behavioral control and subjective norms is 0.23.

These correlation values demonstrate acceptable levels of association between the constructs, as all of them remain below the threshold of 0.85.

TABLE 10
The Squared Multiple Correlation (R2)

Variable	Estimate (R2)
Acceptance of Agricultural *Takāful*	0.28

FIGURE 4. Regression Weights for the Model

According to the findings in Table 10, the squared multiple correlations suggest that approximately 28 percent of the variance in the acceptance of agricultural *takāful* can be

explained by the predictors. In other words, the remaining 72 percent of the variance is attributed to the error term.

The regression weight indicates the estimate of the beta coefficient that measures the effects of every independent's variable on the dependent variable.

TABLE 11
The Regression Weights for every Path Estimate and its Significant

	Hypothesized Path		β	C.R.	P-Value	Result	
Awareness	$---$ >	Acceptance	0.004	0.139	0.89	Not Significant
Attitude	$---$ >	Acceptance	0.338	1.888	0.048	Significant
Perceived Behavioural Control	$---$ >	Acceptance	1.047	2.971	0.003	Significant
Subjective Norms	$---$ >	Acceptance	0.293	2.805	0.005	Significant

Notes: ***$p¡0.001$; **$p¡0.01$; *$p¡0.05$

Table 11 provides the path (arrow) and its corresponding coefficient, illustrating the effects of each independent variable on the respective dependent variable. In pursuit of the study's objectives, four hypotheses have been formulated, and these are analyzed and interpreted below:

Testing of Hypothesis
Awareness and Acceptance of Agricultural *Takāful*

The hypothesis of this study stated that awareness does not impact crop farmers' acceptance of Agricultural *takāful* in Yobe state. The results in Table 12 indicate that the influence of awareness on acceptance of Agricultural *takāful* is positive (0.004 or 0.4%) but not statistically significant ($P¿0.05$, i.e., 0.890). The beta coefficient for the effect of awareness on acceptance is only 0.4%, suggesting that for each unit increase in awareness, acceptance increases by only 0.4%. Therefore, the null hypothesis is accepted, and the first objective of this study is achieved, demonstrating that awareness does not significantly affect crop farmers' acceptance of Agricultural *takāful* in Yobe state. These findings are consistent with the results of Ellis et al. (2017) and Falola et al. (2013), which found that awareness of conventional crop insurance influences farmers' willingness to purchase insurance coverage. However, they contrast with previous findings by Kumar et al. (2011), which indicated that while about 65% of farmers were aware of government risk mitigating measures, only half of them were aware of conventional crop insurance schemes. Similarly, Adesoji et al. (2017) revealed that approximately 70% of respondents were aware of agricultural insurance schemes, but only 15% had obtained fish policy coverage in the last five years.

Attitude and Acceptance of Agricultural *Takāful*

The second hypothesis of this study was formulated as follows: attitude does not have an impact on the acceptance of Agricultural *takāful* among crop farmers in Yobe state. The results in Table 12 demonstrate that the influence of attitude on acceptance of Agricultural *takāful* is positive (0.338 or 33%) and statistically significant ($P¡0.05$, i.e., 0.048). The beta coefficient for the effect of attitude on acceptance is 33%, indicating that for each unit increase in attitude, acceptance increases by 33%. As a result, the null hypothesis was rejected, and the

alternative hypothesis was accepted, achieving the first objective of this study. This indicates that attitude indeed has a significant effect on the acceptance of Agricultural *takāful* among crop farmers in Yobe state.

Perceived Behavioral Control and Acceptance of Agricultural *Takāful*

The hypothesis of this study posited that perceived behavioral control does not have an impact on crop farmers' acceptance of Agricultural *takāful* in the study area. However, the results in Table 12 reveal that the influence of perceived behavioral control on acceptance of Agricultural *takāful* is positive (1.047 or 104.7%) and statistically significant ($P < 0.05$, i.e., 0.003). The beta coefficient for the effect of perceived behavioral control on acceptance is 104.7%, indicating that for each unit increase in perceived behavioral control, acceptance increases by 104.7%. Consequently, the null hypothesis is rejected, and the alternative hypothesis is accepted, achieving the third objective of this study. This implies that perceived behavioral control does indeed influence the acceptance of Agricultural *takāful* among crop farmers in Yobe state. This finding aligns with previous research by Aziz et al. (2017), which similarly emphasized the significance of perceived behavioral control as a critical factor influencing farmers' intentions to accept agricultural *takāful*.

Subjective Norms and Acceptance of Agricultural *Takāful*

The hypothesis of this study stated that subjective norms do not have an impact on the acceptance of Agricultural *takāful* among crop farmers in Yobe state. However, the results in Table 12 reveal that the influence of subjective norms on acceptance of Agricultural *takāful* is positive (0.293 or 29.3%) and statistically significant ($P < 0.05$, i.e., 0.005). The beta coefficient for the effect of subjective norms on acceptance is 29.3%, indicating that for each unit increase in subjective norms, acceptance increases by 29.3%. As a result, the null hypothesis is rejected, and the alternative hypothesis is accepted, successfully achieving the fourth objective of this study. This implies that subjective norms do indeed affect the acceptance of Agricultural *takāful* among crop farmers in the study area.

Conclusions

This research aims to investigate the factors affecting the acceptability of agriculture *takāful* among crop farmers in Yobe State. The study has four main objectives, which are addressed through descriptive analyses utilizing frequencies, percentages, and inferential statistics using SEM as the data analysis technique. For data analysis, both SPSS (version 22) and Amos (version 21) were employed. The results presented in Table 12 indicate that the influence of awareness on the acceptance of agricultural *takāful* is positive but not statistically significant. In contrast, previous findings by Ellis et al. (2017) suggested that awareness of conventional crop insurance significantly influenced farmers' willingness to purchase insurance cover. Additionally, Kumar et al. (2011) found that around 65% of farmers were aware of government risk mitigating measures, but only half of them were aware of conventional crop insurance schemes. Furthermore, the findings reveal that the influence of attitude on the acceptance of agricultural *takāful* is positive and statistically significant.

Moreover, the study reveals that the influence of perceived behavioral control on the acceptance of agricultural *takāful* is positive and statistically significant. This aligns with previous findings by Aziz et al. (2017), which emphasized the significance of perceived behavioral control as an influential factor in shaping farmers' intention to accept and participate in agricultural *takāful*.

Additionally, the results presented in Table 12 demonstrate that the influence of subjective norms on the acceptance of agricultural *takāful* is positive and statistically significant. Overall, the result in table 12 point out that, the influence of awareness on acceptance of agriculture *takāful* is positive (0.004 i.e., 0.4%) and statistically not significant ($P > 0.05$ i.e 0.890). Hence, the null hypothesis is accepted and the second objective of this study is also achieved. Likewise, the result in table 12 shows that, the influence of attitude on acceptance of agricultural *takāful* is positive (0.338 i.e 33%) and statistically significant ($P < 0.05$ i.e 0.048). Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted, and the second objective of this study achieved. Additionally, the result in table 12 confirms that, the influence of perceived behavioral control on acceptance of agriculture *takāful* is positive (1.047 i.e 104.7%) and statistically significant ($P < 0.05$ i.e 0.003). Thus, the null hypothesis was rejected and the alternative hypothesis was accepted and the third objective of this study is achieved. Finally, the findings in table 12 indicated that the influence of subjective norms on acceptance of agriculture *takāful* is positive (0.293 i.e 29.3%) and statistically significant ($P < 0.05$) i.e 0.005. As a result, the null hypothesis was rejected and the alternative hypothesis was accepted, and the fourth objective of this study is achieved.

Limitations and Recommendations

Based on the findings of this study, the following recommendations are provided:

i. Yobe state government should collaborate with Yobe Islamic Center in order to help in *takāful* awareness campaign and how it complied with the sharia principles.

ii. In order to improve the situation of crop farmers in Yobe state, the state government should encourage all large as well as small scale farmers by influencing their attitude positively to accept crop *takāful* product in order to be covered against subsequent risk in the study area.

iii. The most important tool or equipment essential for farming is the tractor. Therefore, Yobe state government should provide enough and accessible modern tractors to farmers as early as possible to improve their production capacity. This will enable crop farmers to get more profit and subscribe to crop *takāful* scheme. iv. *takāful* companies in Nigeria should come-up with a strategy that will continuously attract the attention of crop farmers in the study area to accept crop *takāful* cover.

Suggestions for Further Study

Future studies should consider exploring livestock *takāful* products, as there is a significant population of livestock farmers in the study area who face various risks. To ensure reliable and precise results, upcoming scholars are encouraged to enhance the data collection method. Incorporating interviews as a data collection method, in addition to questionnaires, would be beneficial. Interviews allow for two-way communication, enabling researchers to obtain

more detailed insights from respondents. This approach offers opportunities for participants to provide further elaborations, maximizing the richness of information gathered. Moreover, researchers should consider providing a brief verbal introduction to *takāful* before administering the questionnaires. This step ensures that respondents have a clear understanding of the concepts under investigation, leading to more accurate responses. By combining multiple data collection methods and improving the clarity of the study context, future researchers can enhance the robustness and depth of their findings.

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