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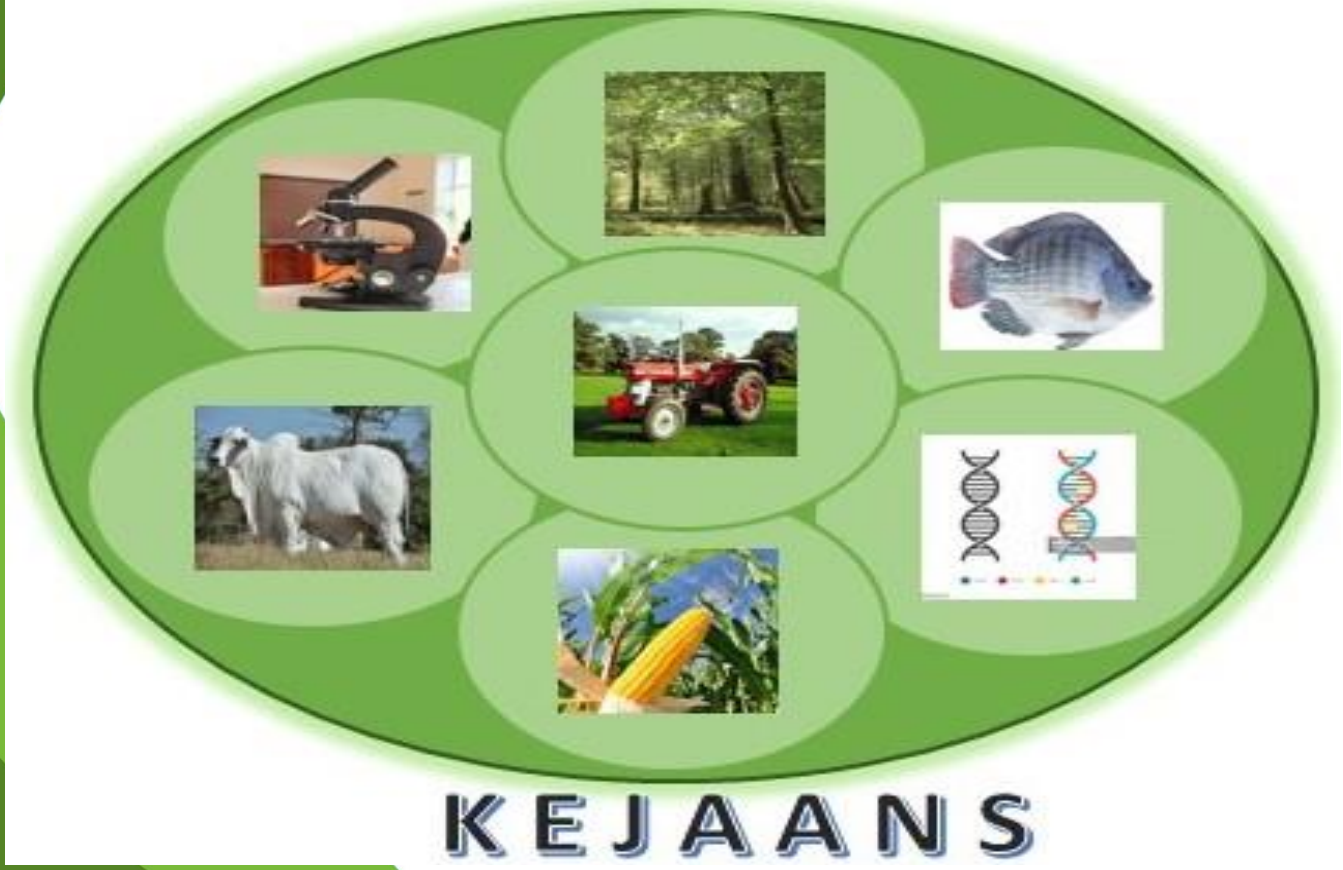

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DETERMINANTS OF FOOD SECURITY AND COPING STRATEGIES AMONG SMALLHOLDER FARMERS OF ALIERO, KEBBI STATE

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ABSTRACT

Achieving food security is of great importance and necessary for any society to strive, therefore emphasis on ensuring food security is paramount for all concerned. This study assessed factors that influenced food security status of smallholder farmers and coping mechanisms adopted to alleviate the effect of food insecurity. Data were collected from 100 smallholder farmers using well-structured questionnaire and were analysed using descriptive statistics and binary logistic regression. The result revealed that respondents' improved yield ($\beta = 0.60$, $p = 0.011$); Food aid ($\beta = 1.42$, $p = 0.027$); Educational background ($\beta = 0.696$, $p = 0.042$) and Age ($\beta = 0.60$, $p = 0.090$) were all found to be significant at 5% and 10% respectively, in addition positively related to enhancing food security level of the respondents. Although almost the remaining variables were found to be insignificant, are positively related to the food security status of the respondents. With regards to coping strategies have significantly enhance their food security level, as they served as measures which cushions the effect of adverse circumstances, such as crop failure or drought on household food security. The implication of this study would help policy makers to facilitate more consistent and comprehensive food production policies that will enhance sustainable food availability and access.

Keywords: food security, smallholder farmers, coping strategies, binary logistic regression,

Introduction

Food security is the central concern for the national and international governments and organisations around the globe (Alemayehu, 2024; Masha, Bojago, Abrham, & Leja, 2023) and food insecurity is one of the major serious challenge affecting many African, some Asian and other south American countries (Negash & Alemu, 2013). According to (Arshad, 2010; Connolly-Boutin & Smit, 2016) food security in most developing countries is advertently related to supply constraints particularly low productivity, inadequate access to production inputs, low level of technology, climate change impacts, political, and socioeconomic stresses. Global hunger prevalence had continuously decreased over the years, but it is in the rise in sub-Saharan Africa due to climate change variability, increase in population growth, incessant growing conflicts and inadequate attention towards agricultural productivity in the region(Wudil, Ali, Aderinoye-abdulwahab, & Raza, 2019) .

The concept of food security has and is being discussed across the globe due to its social and economic importance. Several theorists and organizations have define and describe food security empirically according to their perceived context, and this is because the issue of food security has and is geographically evolving over time(Ivers, 2015). Hence, the most presented definition within the literature is the United Nations (UN) definition of 1996. Which states that Food security can be achieved when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 2006).

Nigeria is a country is the most populous country in Africa blessed with vast agricultural land and human resource but still battling with food security problems due to poor agricultural policies, climate change, and problem of insecurity (Isaac & Adeleke, 2021). Statistics had shown that agricultural sector still remains one of the backbone of the Nigerian economy as it contribute a large share of its GDP and employing about 70% of its population (Folorunso, Momoh, Yusuf, Yg, & Ad, 2023). Smallholder farmers are the main producers of the country's agricultural products, whom are estimated to account for 80% of the total number of farmers in the country. They specialize in cultivating variety of crops and livestock for subsistence and cash crops (Chiaka, Zhen, Yunfeng, Xiao, & Muhirwa, 2022). Hence these set of farmers require and deserve numerous support to produce more food and raw materials vital for industrial sector to enhance domestic production and contribute in solving food and raw material supply deficit which costs the country millions of US dollars in import(Mgbenka & Mbah, 2016). But with the problem of poor agricultural policies, lack of access to adequate credit, climate change variability, insecurity, limited access to modern agricultural technologies and advisory services, agricultural and/or food production is becoming stagnant which will inevitably affect food security status of the smallholder farmers who occupy the largest population in the country(Folorunso et al., 2023; Mgbenka & Mbah, 2016). Other factors such as household income, household size, marital and educational status of the household head also affect smallholder farmer's food security.

Methodology

This study used a multistage sampling technique for selection of the respondents. The sampling technique was used in order to ensure that all the target smallholder farmers are covered and have an equal chance of being selected for the study. First, five villages were randomly selected, which include; Sabiyal, Aliero, Danwarai, Jiga, Marmaro, and in each village twenty farmers were also randomly selected to give a total of 100 farmers.

Data collected were analysed using the descriptive statistics and Binary logistic regression to achieve the study objectives

The **Binary** logistic regression was specified below

$$Z = Log\frac{p}{1-p} = bo + b1X1 + b2X2 \ldots\ldots\ldots bkXk + u$$

Given that Z as food security status, then food secured (i.e. 1) or otherwise (i.e. 0). Now taking the log simplifying equation above, we have the likelihood simplified as:

Where: Z = bo + b1X1 + b2X2 + … + bkXk + u

Z = Where Z = Logit for food security = Logit (p)

bo= Constant
b1, b2,…,bk = the regression coefficients which interpret the effect of X on Z
X = independent variables
K = number of independent variables
P = probability of presence of characteristic of interest
u = error term

In the logistic regression analysis, the independent variables X are as follows;
X_1 = Income from smallholder farmer;
X_2 = Sex (1 if male, 0 if female)
X_3 = Food aid (1 if received, 0 if otherwise)
X_4 = Age of farmers (in years)
X_5 =Improved farm yield (1 improved, 0 if otherwise)
X_6= Household size (number of individuals)
X_7= Access to credit (1 if received, 0 if otherwise)
X_8= Access to advisory service (1 if received, 0 if otherwise)
X_9 = Educational level (1 if have access to formal education, 0 if otherwise)

Results and Discussion

Background of the Respondents

Table 1 below revealed that majority of the respondents (92.0%) were reported to be males and only 8% were females indicating that farming and providing food for the family in the study area is predominantly males business.

44.0% of the respondents were within the age range of 36 to 53 years with a mean age of 48 years, this indicates that the large proportions of the respondents were adults and can adequately be regarded as active, agile, and physically fit to carry out any farming activities.

The table further showed that 92 % were found to be married, combined 64% were found to have western (formal) education, and with majority (40%) having a household size of a range of 11-20. Farmers income which is a major determinant of per capita household expenditure and food security was found to be within the range of ₦200,001- 400,000.

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Factors (determinants) Influencing Food Security

The result of the binary logistic regression model in Table 11 below, revealed that, log likelihood ratio chi-square test LR $\chi^2 = 32.49$. P = 0.0002 indicates that the combined effect of all the variables in the model is different from zero, and the model as a whole is statistically significant compared to the null model with no predictors.

Table 1: Socioeconomic and Demographic Profile of the Respondents

Variable	Frequency	Percentage	Mean	S.D
Sex				
Female	8	8.0	47.97	12.59
Male	92	92.0		
Age				
18 – 35	20	20		
36 – 53	44	44		
54 and Above	36	36		
Marital status				
Single	5	5.0		
Married	92	92.0		
Widowed/divorced	3	3.0		
Educational level				
Qur'anic education	36	36.0		
Primary education	37	37.0		
Secondary education	22	22.0		
Tertiary education	5	5.0		
Household size				
<4	10	10.0		
5-10	17	17.0		
11-20	40	40.0		
21-30	33	33.0		
Household income				
<200000	20	20.0		
200001-400000	40	40.0		
400001-600000	29	29.0		
>600001	11	11.0		

Table 2. Binary logistic regression results

Variable	Coefficient	SE	Z-stat	Prob.
Income	1.21804	.9867595	1.23	0.217
Sex	.9068209	1.423883	0.64	0.524
Food aid	1.426714	.6461574	2.21	0.027
Age	.0605079	.0356703	1.70	0.090
Improved yield	1.697587	.6635645	2.56	0.011
Household size	-.0950056	.0636722	-1.49	0.136
Access to credit	.9063736	.6398486	1.42	0.157
Access to advisory service	.1364098	.6798547	0.20	0.841
Educational background	.6961713	.3416859	2.04	0.042
LR chi 2 (9)	= 32.49			
Prob. > chi2	= 0.0002			
Pseudo R^2	= 0.2592			

Based on the results of z statistics it is indicated that respondents' improved yield (β = 0.60, p = 0.011); Food aid (β = 1.42, p = 0.027); Educational background (β = 0.696, p = 0.042) and Age (β = 0.60, p = 0.090) were all found to be significant at 5% and 10% respectively, and positively related to enhancing food security level of the respondents. This results is supported by the findings of Wudil et al., (2019) and Emmanuel, Issahaku, & Agebase, (2023) who found that farming output and educational attainment were positively related to beneficiaries' household food security status Variables like income, Sex, access to credit and advisory services were all found not to be significant but are positively related to the food security status of the respondents while household size was found to be insignificant and negatively related to food security status of the respondents. This result is consistent with the result of the study by Suharyanto et al. (2014) which confirms that farming households in Bali was found to be positively and significantly related to food security

Coping Strategies Employed by Respondents

Entries in Table 3 indicates that the perceived major coping strategies employed by farmers in cushioning the effects of food insecurity include: selling of assets to buy foods, (M= 2.69), receiving food aid (M= 3.00) and seeking assistance from families and friends (M= 3.51). Further reported that some coping strategies employed by households include reducing the quality and quantity of meals and the purchase of less preferred food. These were also major strategies employed by the households in the study area to cushion the effect of food insecurity. Other coping strategies employed by the households include: eating foods that are less preferred (M= 2.93); borrowing money from families and friends (M= 3.49), skipping of meals (M= 3.15); and purchasing food on credit (M= 3.27). According to Amaza *et. al.,* (2008) household assets is considered one of the measures of household resilience, which cushions the effect of adverse circumstances, such as crop failure or drought on household food security. Household assets include livestock, machineries and land which could be sold, if need be, so as to purchase food used in feeding the households in times of adversity.
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Table 3. Coping strategies adopted by farmers

S/N	**Coping strategy**	1*	2*	3*	4*	5*	M	S.D
1	Buying and consuming less preferred food	14	21	32	24	9	2.93	1.174
2	Receiving food aid	11	25	29	23	12	3	1.189
3	Borrowing money from families and friends	3	15	23	48	11	3.49	0.98
4	Seeking assistance from families and friends	2	18	25	37	18	3.51	1.049
5	Purchasing food on credit	7	16	36	25	16	3.27	1.127
6	Reduction of food quantity served to the adults	9	20	30	31	10	3.13	1.125
7	Skipping of meals	10	17	37	20	16	3.15	1.184
8	Selling of assets to buy food	17	29	30	16	8	2.69	1.169

Conclusion

Based on the study findings it was indicated that respondents' improved yield, Food aid Educational background and Age positively related to enhancing their food security level Hence, governments and other policy makers are recommended to further facilitate more consistent and comprehensive food production policies that will enhance sustainable food availability and access.

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