NALYSIS OF FACTORS INFLUNCING FOOD SECURITY STATUS OF CROP-LIVESTOCK FARMERS IN KADUNA STATE

[1]Anosike, F.U., [2]Atala, T. K., [2]Akpoko, J. G., [1]Rekwot, G.Z. and [1]Owoshagba, O.B.
[1]National Animal Production Research Institute, Ahmadu Bello University, Shika, Zari. Nigeria.
[2]Department of Agricultural Extension and Rural Development, Faculty of Agriculture, Ahmadu Bello University, Shika, Zaria.
Corresponding Author's Email and Phone No: anosikefrancisugo@gmail.com
+2348038192350

ABSTRACT

The study analyzed the factors influencing food security status of crop-livestock farmers in Kaduna State, Nigeria. Data were collected from 351 crop-livestock farmers using a well structured questionnaire. Probit regression and food security index were used in the data analyses. Result of their food security status shows that 21% of the respondents were food secured with an average daily calorie intake of 4325.13kcal, which is above the recommended calorie intake of 2260kcal, while 79% were food insecure with a daily calorie intake of 1287kcal, which is below the recommended daily calorie intake of 2260kcal. Furthermore, socio-economic and institutional factors; age and number of extension visit significantly influenced the food security status of crop-livestock farming household positively, while marital status, years of schooling, family size, crop-livestock experience, and amount of credit significantly influenced the food security status of crop-livestock farming household negatively. It was recommended that food insecure households should be assisted by both Government and Non-Government Organizations to increase production of staple crops and livestock to enhance their food security status through improved access to better food production technologies and provision of incentives that would motivate farmers to produce more, like adequate farming inputs, accessible roads, electricity, good market and stabilize price.

KEY WORDS: food security, crop-livestock, farmers, factors influencing

INTRODUCTION

Food insecurity still represents one of the biggest challenges facing most part of the world population and must be treated with the utmost urgency (Pasquale and Matteo, 2011). Food security exists 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, 2015). One best way to increase food production, reduce wide spread hunger, increase income and ensure food security for farmers, and still ensure utilization of resources and environmental protection without hampering economic growth, is encouraging smallholder farmers to continually involve themselves in integrated crop-livestock farming system. The Integrated farming system of crop and livestock is one of the many technologies that have been developed for the sustainability of production and increase farmers' income (Mukhlis *et al.*, 2018). Food demand is increasing day by day as food production is declining; this is as a result of the ongoing conversion of land to residential land, drastic reduction of working farmers (Jaishankar *et al.*, 2017) and also the high rate of insecurity in the country. In the face of expanding human population, food production has to be increased commensurately to enhance food security among farming household; hence the need to analyze the factors influencing crop-livestock farmers' food security status in Kaduna state. The study analyzes the food security status crop-livestock farmers' and factors influencing the food security status.

METHODOLOGY

Study area

The study was conducted in Kaduna State, Nigeria. The state is located within the Northern part of Nigeria's High Plains. Kaduna state comprises of 23, Local Government. These Local Government Areas of the State are grouped into 4 Agricultural Development Project (ADP) zones, namely Maigana, Lere, Samaru-kataf and Birnin Gwari zones. By the 2006 census, the total population of the State was estimated at 6.1 million (NPC, 2006) and now about 9.1million people in 2019, based on an

annual growth rate of 3.2%. The State is well known for its involvement in crop-livestock production. (Kaduna State Ministry of Economic Planning, 2013).

Sampling and data collection

A multi-stage sampling technique was employed in selecting farming households for data collection. The first stage involved random sampling of two Local Government Areas (LGAs) form each of the four (4) agricultural zones. The second stage was the random selection of two villages from each of the selected Local Government Areas. Finally, using Yamane (1967) slovian formula, (as applied by Abdurahman *et al.*, 2016) the sample size based on an assumed 5% margin of error, 95% confidence and applying finite correction factor was determined, from the list of rural farmers obtained from Kaduna State Agricultural Development Project (KADP) in 2018 to give atotal of 351 farmers which made up the sample size for this study. The Slovian formula is given as: $n_0 = \frac{N}{1+N\,(e^2)}$. Where: n_0 = sample size; $e^2 = 0.05$; N = total number of observations.

The study made use of primary data. The primary data were obtained through the use of a questionnaire administered to 351 household heads in the selected villages.

Analytical technique

Food security index was used to achieve food security status of farmers in this study.

$Z = \frac{K}{R}$ ---------- (1)

Where:

Z = Food Security Index

K = Per capita calorie available to a household per day

R = Recommended per capita calorie intake per day

A household is said to be food secure if its calorie food intake is more than or equal to Z. The recommended daily per capita calorie intake is 2260Kcal (FAO, 20150).

Probit regression model was used to determine the factors influencing crop-livestock farmers' food security status

Probit Model is specified explicitly as:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + ei$-- (2)

Y = Food security status (1= for food secure households; 0 = for food insecure households)

X_1 = Age (years)

X_2 = Marital status (Married = 1, Otherwise = 0)

X_3 = Sex (Male = 1, Female = 0)

X_4 = Income (Naira) per year (both farm income and non-farm income)

X_5 = Education (Number of years of formal education)

X_6 = Household size (number)

X_7 = Farm experience (years)

X_8 = Farm size (hectare)

X_9 = Herd size (tropical livestock unit)

X_{10} = Amount of credit obtained (Naira)

X_{11} = Extension contact (Number of contacts per year)

X_{12} = Membership of cooperative (years)

RESULT AND DISCUSSION

Food security status of crop-livestock farmers

Food security index was used to determine their food security status based on their daily calorie intake. The result in Table 1 shows that 21% of the respondents are food secured with an average daily calorie intake of (4325.13 kcal) which is higher than the recommended daily per capita calorie intake, while 79 % of the respondents were said to be food insecure with an average daily calorie intake of (1287.77kcal) which is lower than the recommended daily per capita calorie intake. This implies that majority of the respondents in the study are food insecure. . The food insecurity gap and surplus index which measures the extent of deviation from food security line shows that food secure households exceeded the calorie requirement by 91%, while the food insecure households fell short of the calorie requirement by 43%. This shows a gap between the food secure and food insecure households in the study area. This result findings disagrees with the one reported by Ojeleye, (2015)

who reported in his study that the FSI of household obtained showed that 66% of the respondents were able to meet the daily calorie intake of 2260kcal per capital. However the result finding agrees with the one reported by Misgina, (2014) who reported that 31.2% and 68.8% of the sampled household were food secured and food insecure respectively. Furthermore, this result findings agrees with one reported by Saleh and Mustafa, (2018) who reported that majority (54.5%) of the respondents in the study were food insecure.

Table 1: Distribution of respondents by their food security status

Statistical estimates	**Food secure**	**Food insecure**
Frequency	74	277
Percentage	21.08	78.92
Average daily calorie intake (kcal)	4325.13	1287.77
Maximum daily calorie intake (kcal)	9999.59	2242.8
Minimum daily calorie intake (kcal)	1056.07	453.4
Shortfall/surplus index (P)	0.91	-0.43
Head count ratio (H)	21	79
Standard deviation	2633.97	508.02
Recommended daily per capita calorie intake (Kcal)`	2260	

Factor influencing crop-livestock farmer's household food security status

The probit regression result shown on Table 2 reveals that age and number of extension visit positively influenced the food security status in the study area at 1% significance level, whereas marital status, family size, crop-livestock experience and amount of credit negatively influenced the food security status in the study area at 10% significance level, also year of schooling was said to negatively influenced the food security status at 1% significance level. This implies that the older they become the more food secure they become, also the more the extension visit by the extension agents to disseminate new technologies to the farmers the more food secure they become. Furthermore, the less educated they are, increase in family size, less experience in crop-livestock integration, and less amount of credit obtained, the more food insecure they become. This result finding disagrees with the one reported by Ahmed *et al.* (2015) who reported that the major determinants that positively influenced food security in the study area were gender, and level of education, cooperative membership, and farming experience, access to credit, income, and farm size. The finding at variant with the one reported by Keku, (2017) who revealed that membership to cooperative society, access to credit, farm size and non-farm income was positive and significantly influenced the food security status of the farming household. However, the finding agrees with Misgina (2014) who reported that family size was negatively related and statistically significant to food security status of the rural household.

Conclusion and Recommendation

The study revealed that majority of the respondents in the study area are food insecure. Furthermore, socio-economic and institutional factors significantly influenced the food security status of crop-livestock farming household.

The study, recommends that policy makers take into consideration the significant effect played by socio- economic and, institutional factors in formulating any policy on crop-livestock integration and food security in Kaduna State. Also food insecure households should be assisted by both Government and Non-Government Organizations to increase production of staple crops and livestock to enhance their food security status.

Table 17: Estimate of probit regression of the determinants of food security status

Variable	Coefficient	Standard error	T-value	Marginal effect
Constant	0.91689	0.48989	1.872*	
Age	0.02612	0.00924	2.826***	0.0066
Marital status	-0.40115	0.22577	-1.777*	-0.1019
Years of schooling	-0.15794	0.05777	-2.734***	-0.0401
Family size	-0.02915	0.01749	-1.667*	-0.0071
Farm size	0.03859	0.02813	1.372	0.0098
Crop –livestock experience	-0.02030	0.01058	-1.918*	-0.0052
Years of membership of cooperative society	-0.02107	0.02534	-0.831	-0.0053
Number of extension visit	0.03099	0.01217	2.546***	0.0079
Amount of credit received	-0.00009	0.00006	-1.665*	-0.0034
Total household income	0.00006	0.00011	0.547	0.0058
Prob > chi^2	0.0000			
Pseudo R^2	0.217			
LR $chi^2(10)$	41.83			
Log likelihood	-158.30			

Note: *** and * significant at 1% and 10% levels of probability

REFERENCES

Abdurrahman, S., Okam, C. Y., Yusuf, O. and Suleiman, A. D. (2016). Comparative Analysis of Probability of Rice Production among Men and Women Framers in Ebonyi State, Nigeria, *Asian Journal of Agricultural Extension, Economic and Sociology*, 10 (1): 1-7

Ahmed F. F., Eugene, C. E. and Abah, P. O. (2015). Analysis of Food Security among Farming Households in Borno State, *Nigeria. Journal of Agricultural Economics, Environment and Social Sciences 1(1):130–141 September, 2015*

Food and Agricultural Organization (2015). The State of Food Insecurity in the World. Strengthening the Enabling Environment for Food Security and Nutrition. Remo: FAO

Jaishankar, N., Janagoudar, B. S., Kalmath, B.,, Naik, V. P and Siddayya, S. (2017) "Integrated Farming for Sustainable Agriculture and Livelihood Security to Rural Poor," International Conference on Chemical, Biological, and Environmental Sciences, May 12-13, Kuala Lumpur, 2017. 22–24.

Kaduna State Ministry of Economic Planing (2013). Kaduna State Infrastructural Plan 2018-2050.

Keku, O. M. (2017). Analysis of Food Security and Coping Strategies of Rural Farm Household in Kaduna State, Nigeria. Unpublished PhD Thesis. Department of Agricultural Economic, Faculty of Agriculture, Ahmadu Bello University, (ABU), Zaria.

Misgina, A. (2014). Rural Household Food Security Status and its Determinant: The Case of Laelaymychew Woreda, Central Zone of Tigrai, Ethiopia. *Journal of Agricultural Extension and Rural Development.* 6(5): 162–167 ISSN 2141-2170

Mukhlis, M., Melinda, N., Nofialdi, and Mahdi, K. (2018). The Integrated Framing System of Crop and Livestock: A Review of Rice and Cattle Integration Farming. International Journal of Sciences: Basic and Applied Research. 42(3): 66-82

Ojeleye, O. A. (2015). Analysis of Farm Household and Community Food Security in Kaduna State, Nigeria. An unpublished Ph.D Thesis, Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria.

Saleh, M. K and Mustafa, A. S (2018). Food Security and Productivity among Urban Framers in Kaduna State, Nigeria. Journal of Agricultural Extension. Vol. 22 (1). 2018. hpp://journal aesonnigria.org. ISSN (e): 24086851; ISSN

Yamane, T., (1967). Statistics: An Introductory Analysis. 2nd Edition, Harper and Row, New York.