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EFFECT OF FARMER-HERDER CONFLICT ON FOOD SECURITY OF PASTORAL AND AGRO-PASTORAL HOUSEHOLDS IN KWARA STATE, NIGERIA

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Abstract
Inspired by the low food security status and vulnerability among pastoral and agro-pastoral households, we estimated pastoral-farmer conflict, determined food security status, appraised the outcome of pastoral- farmer conflict on food security and describe the survival game plans adopted by pastoral and agro-pastoral households to alleviate the effect of food insecurity in Kwara State, Nigeria. Purposive and random sampling methods were deployed to choose 120 respondents. The main tools of analysis are descriptive statistics, food safety index and logistic regression. The study showed that 37.2.5% of respondents were food secure while 62.8% were food insecure. In addition, pastoral-farmer conflict, age, herd size, migration, distance to grazing area, and number of animals sold to alleviate the outcome of food insecurity were the important drivers of food security in the area. Moreover, selling of animals, embracing litigation, being industrious, herders' experience, agro-pastoralism, satisfying other parties and seeking for supports from friends, relatives and government are the most effective survival game plans adopted by households. In view of the foregoing, government must encourage ranching and adoption of Rural Grazing Area (RUGA) to mitigate pastoral-farmer conflict. Schemes and game plans designed at increasing herd size should be supported.

Key Words: *Fight, Food safety index, Pastoralist, RUGA settlement and survival game plans*

Introduction

Pastoralism is a process of flocking animals while the pastoralists are those whose main sustenance is livestock flocking (Bhasin, 2011). Agropastoralism is a way of life based on growing of crops and raising of livestock as the primary means of economic activity. The Fulani ethnic group are traditional pastoralists and they possessed most of the livestock in Nigeria. They are found within arid and semi-arid regions and migrate from one part of the country to another hunting for grasses and water for their animals and in the process

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farmers' plots are damaged leading to conflicts between farmers and herders.

Pastoral-farmer conflict is still frequent in most parts of the country (Shehu *et al*., 2020). Conflict is a fight between competing users (Dietz and Albert, 2016). It could be facilitated by increasing population and climatic changes, which have forced farmers to plough more lands that are meant for grazing and cattle routes thereby causing more enmity among the users. The tenacious opposition between herders and farmers however, have resulted into detestation, bitterness and commotions in substantial parts of the country. This fight has grown tremendously, open out and escalate over the last five years and today constitutes a serious threat to our national existence. Many people were maimed, villages were burnt and so many users lost their lives and properties due to conflict. Frequent retaliation attacks and murdering aggravates the harmonious resolution of the conflicts. Community intimidation and organized crimes are becoming the standard and have escalated into a fatal illegal activity. Consequently, losses have been on the increase and the victims are on both sides (Shehu *et al*., 2020). Conflicts have indicated high tremendous ability to worsen the food crisis, disrupt free movement and harmonious relationship that exists among the different resource group users in the country (Moritz, 2016).

Food security exists when sufficient, safe, and nutritious food is always available to a target population, so that basic dietary needs for a healthy and active life are met (FAO, 2006). Food must be obtainable, attainable and well make use of for food security to occur at all levels. Food obtainability means that adequate, safe and nourishing food is either locally manufactured or imported. Food obtainability may not translate to food attainability. For food to be attainable, farmers and pastoral households must have enough purchasing power to always purchase required amount and standard food items. Furthermore, food utilization entails consuming adequate amount and standard food intake (Shehu *et al*., 2019). Food insecurity emerges when there is poor food availability, accessibility and utilization. Food insecurity if left unaddressed, could raise susceptibility to illness and lowers productivity.

Food insecurity is still a threat among pastoral and crop farming households in Nigeria (Shehu *et al.,* 2020). The incessant fights between these two agricultural resource-users over rangeland resources, worsen food insecurity situations in the country. Numerous studies have emanated on factors influencing food security of farming households (Agwu 2014; Ahmed *et al.*, 2016; Shehu *et al.*, 2020; Shehu *et al.*, 2022). Surprisingly, data quantifying the outcome of conflict on food security of pastoral households are rare in the literature. Thus, this study quantifies loses due to farmer-herder conflict, measures food security status, determines the influence of conflict on food security and identifies the survival game plans deployed by respondents in the area.

Literature Review

Concept of Food Security

Food security is having at all times an enough food and food products to meet rising demand to mitigate fluctuation in output and price (Idrisa *et al.,* 2008). According to FAO (1996) food security is a situation when all people at all times have physical and economic access to sufficient, safe and nutritious food for a

healthy and active life. According to Omonoma and Agoi (2007), there are four major elements of food security; food availability, food access, food utilization, and not losing the excess. Food security entails producing food that will go round every citizen both in quality and quantity (Oriola, 2009). To achieve this, agricultural production needs to be enhanced with adequate knowledge of the environment, climatic condition, the market and its operations.

Food insecurity is the direct opposite of food security. It is the poor access to sufficient quality and quantity of food for an active and healthy life. It is the inability of households or individuals to meet the required consumption level in the face of fluctuating production, price, and income (Maharjan and Chhetri, 2006). According to Gillespie and Haddad (2001), food insecurity boils down to inability of households to have reliable access to food in sufficient quantity and quality to enjoy active and healthy life. Food importation as a result of insufficiency has continued to be on the rise in Nigeria (Edokpa and Okafor, 2009). Food wastage has also been indicated as a bane of food security in Nigeria. Export of staple food has also been indicted as a cause of food insecurity, the export of staple food crops should be de-emphasized (Igberaese and Okojie-Okoedo, 2010).

Study Location

The study area is Kwara state. Kwara state was created on the 27th of May 1967 along with eleven other states. Kwara lies approximately on latitude 8°30′ and 8°50′ N and longitude 4°20′ and 4°35′ E of the equator. The state has a total land area of 36,825km^2. It is bordered in the east, south, north and west by Kogi, Osun, Niger, and Republic of Benin respectively. The mean temperature and rainfall ranges are 27ºC - 35ºC and 1,000-1,500mm respectively. The state has wet and dry seasons. The wet season comes within April-October while the dry season falls within November-March. The state is blessed with large volume of water bodies with an evaluated population of 3.2 million (NPC, 2016). The state is classified into four using ecological, cultural and agricultural project administrative amenity. These are: Zone A: Baruteen and Kaima Local Government Areas (LGAs); Zone B: Edu and Patigi LGAs; Zone C: Asa, Ilorin East, Ilorin South, Ilorin West and Moro LGAs and Zone D: Ekiti, Ifelodun, Irepodun, Offa, Oyun, Isin and Oke-Ero LGAs (KWADPs, 2010). Kwara inhabits people of different traditions, cultures and ethnic backgrounds such as: the Yorubas, Hausas, Fulanis, Nupes and Barubas (Figure1).

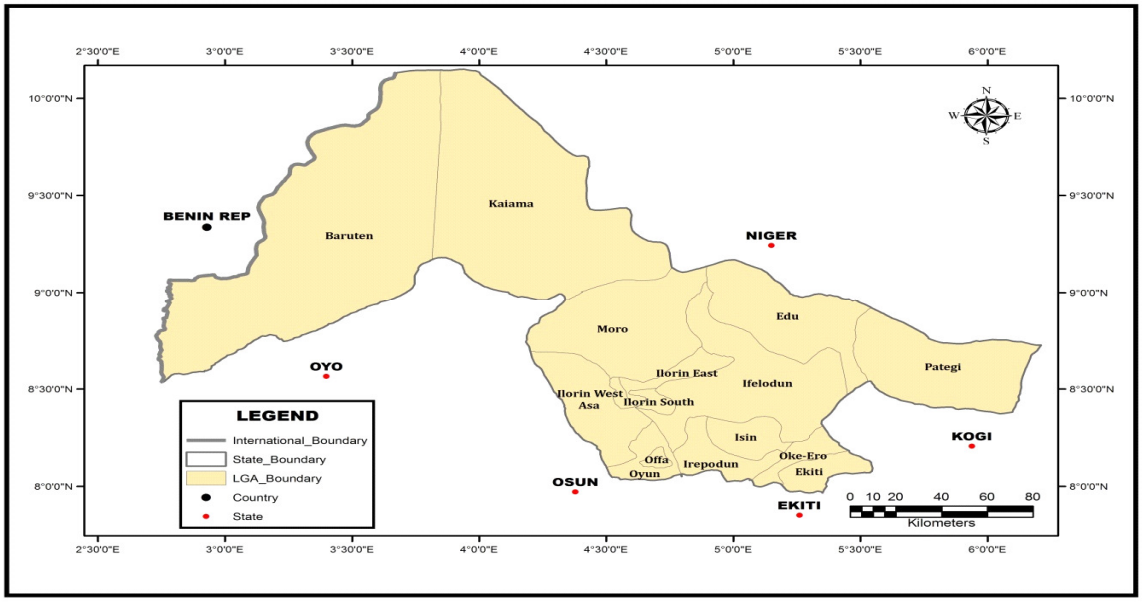


Fig 1. Map of Kwara State

Methodology

Data Collection and Sampling Methods

Kwara State has 16 local government areas (LGAs), 10 out of 16 LGAs are frequently linked with the conflict (Adisa, 2012). Firstly, 6 LGAs out of the 10, were chosen at random, namely: Asa, Patigi, Ifelodun, Ekiti, Isin, and Oke-Ero LGAs. Thereafter, villages where conflicts are well pronounced were picked, purposively. Hence, Alapa in Asa, Oro Ago in Ifelodun, Motokun in Patigi, Obbo Aiyegunle in Ekiti, Isanlu-Isin in Isin and Odo-Owa in Oke-Ero LGAs were selected. The lists of all concerned pastoral and agro-pastoral household heads were gotten from the village leaders and 20 persons were picked at random from each village to make up 120 respondents.

Analytical Techniques

This study deployed descriptive statistics, food safety index and logistic regression to attain the objectives. To describe the socio-economic features and the adopted survival game plans, statistical tools and a Likert type-scale were deployed respectively. The classification into food secure and food insecure was done using food safety index as shown below:

$$Si = \frac{PFC}{2/3MPFC} \quad [1]$$

Where:

Si = food safety index

PFC = per capita food costs

$MPFC$ = mean per capita food costs

If $Si \geq 1$= household is said to be food secured and if $Si < 1$= household is food insecured (Salau *et al.*, 2019).

Binary logistic regression model was deployed to verify the outcome of pastoral-farmer conflict on households' food security as shown below:

$Q = ho + h_1p_1 + h_2p_2 + \cdots + h_kp_k + u$ [2]

Where

Q = binary outcome of food safety status, where food-secure household takes the value of 1and 0 if otherwise

Ho = Constant

h_1, h_2,…,hk = the regression coefficients, which interpret the effect of p on Q
p = descriptive factors
k = amount of descriptive factors
u = error term
The descriptive variables are:
p_1 =pastoral- farmer conflict (proxy by total loss due to conflict in Nigerian Naira)
p_2 =value of animals sold to alleviate the outcome of food insecurity (Nigerian Naira)
p_3= herd size (number)
p_4= herding experience of the household head (years)
P_5=household distance to grazing area (km)
P_6=migration (Yes = 1; No = 0)

The survival game plan of the pastoralists and agro pastoralists were estimated using 15 items on a 3-point Likert-type scale. The items include 10 problem-designed survival game plans (PDSGP), 3 feeling-designed survival game plans (FDSGP) and 2 social support seeking survival game plans (SSSGP) as corroborated by Adisa (2012).

Results and Discussion

Socio-economic Features of Respondents

All 100% of the respondents were males (Table 1). It suggests that gender sensitivity is inclined towards men than women among pastoral and agro-pastoral households. The average age of household head is 43.3 years. Implying that respondents are still young and could withstand the rigours that are associated with livestock flocking. Age is a significant variable that may affect the ability and cleverness towards attaining the food needs of the family (Shehu *et al.,* 2019). Household size connotes the entire number of people living and feeding in the same household. Most (73.3%) family sizes fall within 1-5 persons while 26.7% have household sizes between 6-10 members. The average household size is 4 persons. Furthermore, majority (56.7%) of the respondents had Qur'anic education while 13.3% had secondary education. Education is essential in managing risks and uncertainties that are linked with pastoralism and technology adoption in the industry. According to Onoja *et al*. (2012), people that are educated are better endorsers of transformations. Most (55.0%) respondents fall between 31-60 years, while 18.3% of them have between 61-90 years of herding experience with an average of 43 years. Experience could assist in reducing risks and uncertainties that are associated with livestock herding. Most (62.5%) of the respondents have herd sizes between 31-60 cattle, 10.8% have herd sizes between 61-90 cattle. The average herd size is 41 cattle. Most (71.7%) respondents were married, married households usually have larger household size than other households. This could constitute a threat to food security in the area.

Food Security Situation of Respondents

The average per capita food costs (MPCFC) of respondents were estimated to be ₦4001.122 per week. The households whose per capita food costs (PCFC) lies below and above ₦4001.122 were tagged as food insecure and secure respectively (Shehu *et al.,* 2019). Table 2 indicated that 37.2% of the respondents were food secure while 62.8% were food insecure.

Factors Affecting Food Safety Index

The Nagelkerke R Square value of 0.691 was obtained, indicating that 69.1% of the entire variation in food safety index

is explained for by the evaluated explanatory variables (Table 3). The coefficient of pastoral-farmer conflict was positive and significant at 5%. This indicates that the more the conflict, the better the chance of being food secured. This is because most households often get some form of relief packages or supports from relations, well-wishers, government and non-government organizations when conflict occurs. The number of animals sold to alleviate the outcome of food insecurity was also important at 1%. This suggests that the more the number of animals sold the more food secured the household. Herd size is positive and important at 5%, indicating that the larger the herd size, the more food secured the household. The possibility of being food secure rises as the households' livestock ownership increases. This is because livestock are livelihood assets for the pastoral and agro-pastoral households. In fact, their ability to withstand shocks is directly linked to their livestock holding. The coefficient of age and distance to grazing area are negative and significant at 10% and 5% level respectively. This connotes that, an increase in the age of the household head increases the likelihood of the household to be food secure among pastoral and agro-pastoral households. This finding disagrees with those of Shehu *et al*. (2020), in their study on the effects of farmer-herder conflict on farming households' food security in Kwara State, Nigeria. Distance to grazing area has negative connection with household food security. This suggests that the probability of being food secure decreases as the distance to grazing areas increases. The herder will incur more expenses on feeding his livestock rather than members of his family. Moreover, the coefficient of migration is found positive and important at 1%. Implying that migration is a viable survival game plans to alleviate food insecurity in the area.

Survival Game Plans Adopted by Households

Table 4 indicates that the game plans deployed are selling of animals (MS = 2.19), embracing litigation (MS = 2.15), being industrious (MS = 2.07), herders' experience (MS = 2.05), agro-pastoralism (MS = 2.04), appeasing other parties (MS = 2.03), and seeking for supports from friends, relatives and government (MS = 2.01) are the most effective game plans deployed by the respondents and are ranked 1st, 2nd , 3rd, 4th, 5th, 6th and 7th position respectively. Other non-effective game plans are borrowing from banks to buy foods (MS = 1.78), diversification (MS = 1.68), praying to God for calm (MS = 1.08) and accepting conflict as destiny (MS = 1.77).

Conclusion

Farmer-herder conflict is still prevalent in the country and foretells terrible outcome for food security and rural development. This study quantified pastoral-farmer conflict, measured food security status, examined the outcome of the conflict on food security and describe the survival game plans adopted by respondents to alleviate the outcome of food insecurity. Interestingly, most of the respondents were food insecure. Pastoral-farmer conflict, age, herd size, migration, distance to grazing area, and number of animals sold to alleviate the outcome of food insecurity were the significant drivers of food security. Furthermore, selling of animals, embracing litigation, being industrious, herders' experience, agro-pastoralism, appeasing other parties

and seeking for supports from friends, relatives and government are the most effective survival game plans deployed to alleviate the outcomes of conflict. Consequently, to mitigate the outcomes of the conflict, government must initiate and encourage the establishment and use of cattle ranching and Rural Grazing Area (RUGA). Since, herd size is directly related to food security, schemes and game plans towards increasing herd size should be intensified.

Acknowledgement

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Table 1: Socio-economic features of households

Characteristics	Frequency	Percentage
Age (years)		
1- 30	30	25.0
31-60	69	57.5
61-90	21	17.5
Education qualification		
Quranic education	62	56.7
Primary education	42	35.0
Secondary education	16	13.3
Marital Status		
Single	22	18.3
Married	86	71.7
Divorced	12	10.0
Household size		
1 – 5	88	73.3
6- 10	32	26.7
Herding experience (years)		
1 – 30	32	26.7
31- 60	66	55.0
61- 90	22	18.3
Herd size		
1 – 30	32	26.7
31- 60	75	62.5
61- 90	13	10.8
Migration		
Yes	55	45.8
No	65	54.2

Table 2: Households' food safety index

Item	Food secure (%)	Food insecure (%)	All
Proportion of households	37.2	62.8	100
Number of households	48	72	120

Table 3: Logistic regression

Variable	Coefficient	Standard Error	Significance
Pastoral-farmer conflict (p_1)	0.000035	0.000016	0.027865**
Number of animals sold per year (p_2)	0.325956	0.122379	0.007733***
Herd size (p_3)	0.050409	0.022418	0.024537**
Age of the household head (p_4)	-0.040615	0.021033	0.053481*
Household distance to grazing area (p_5)	-0.304722	0.127098	0.016505**
Migration (p_6)	4.115215	0.755741	0.000000***
Constant	-6.960727	2.255057	0.002024***

* **, *** Significant at 10%, 5% and 1% respectively

Table 4: Survival game plans

Survival game plans	Mean	STD
Problem-designed survival game plans (PDSGP)		
Industrious	2.07	0.632
Utilizing herding experience	2.05	0.634
Take money from banks or relatives	1.78	0.578
Selling of animals	2.19	0.694
Agro-pastoralism	2.04	0.635
Purchasing food	1.98	0.655
Migration	2.12	0.667
Relying on local charms	1.38	0.534
Diversification	1.68	0.622
Fencing of ranch	1.48	0.534
Feeling-designed survival game plans (FDSGP)		
Accepting as destiny	1.77	0.588
Praying to God for calm	1.08	0.544
Satisfying other parties	2.03	0.677
Social support seeking survival game plans (SSSGP)		
Embracing litigation	2.15	0.672
Seeking for supports from friends, relatives and governments	2.01	0.734

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