



LIVELIHOOD DIVERSIFICATION AND SETTLEMENT PATTERNS AMONG AGRO-PASTORALISTS IN IBADAN/IBARAPA AGRICULTURAL ZONE, OYO STATE, NIGERIA

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Abstract

This study assessed livelihood diversification and settlement patterns among agro-pastoralists in Ibadan/Ibarapa Agricultural Zone, Oyo State, Nigeria. A multi-stage sampling procedure was used to select 106 agro-pastoralists, while data were collected with the aid of pre-tested and validated interview guide. Data were subjected to descriptive (frequency, percentage, mean) and inferential (chi-square) statistics using Statistical Package for Social Sciences (SPSS) version 20.0. Results revealed that the mean age of respondent was 43 years, and that 60.4% of the respondents were sole owner of their cattle. The major livelihood activities were sale of cattle, crop farming and sale of milk/milk products. Findings also showed that many of the agro-pastoralists practiced either the transhumance (25.5%) or semi-transhumance (55.7%) settlement patterns. It was further revealed that the respondents benefited from equitable access to land, expansion of business trade and market integration. Some of the challenges faced by the agro-pastoralists include; cattle defecating on streams and roads (78.3%), extensive sedentarization (80.2%), farmland invasion by cattle (85.8%), and overgrazing on fallow lands (80.2%). Chi-square analysis revealed that there were significant associations between settlement patterns and livelihood diversification; selling of milk and milk product ($\chi^2 = 12.248, p \leq 0.01$), cultivation of crops ($\chi^2 = 15.362, p \leq 0.01$), petty trading ($\chi^2 = 7.957, p \leq 0.05$) and commercial selling of livestock ($\chi^2 = 9.456, p \leq 0.05$). It was concluded that the transhumance or semi-transhumance settlement patterns adopted by the agro-pastoralists had positive influence on their livelihood diversification into different activities. It is therefore recommended that agro-pastoralists should diversify into more income generating livelihood activities.

Keywords: Agro-pastoralist, Challenges, Herd size, Livelihood diversification, Settlement Pattern

Introduction

To attain its full potential, agricultural output in every country requires an enabling environment. Historically, livestock production involves rearing animals for meat, eggs, milk, wool and skin production, while raising young ones. It also serves as economic resource basis for survival and livelihood sustenance of agro-pastoralists, even though cattle's relevance to food security, household nutrition, agricultural employment, soil fertility, livelihoods, transportation, and long-term agricultural productivity is still being disputed (Chilonda and Otte, 2006; Randolph *et al.*, 2007; Perry and Sones, 2007). More so, livestock farming provides a safety net in the form of tangible assets to farmers, and diversification strategy for food supply. All of this has demonstrated the crucial role that livestock breeding plays in the livelihoods of people in emerging countries. Of more importance, to harness all these benefits, quality feed and appropriate animal feeding are essential. Although, ruminant feed diets vary, pasture is

essential for long term ruminant management (Atanga *et al.*, 2013), since it is the least expensive kind of feed available for ruminant livestock (Buckingham *et al.*, 2013). Furthermore, a well-managed pasture may cover over 90% of the energy demands of sheep and cattle, and 70% of the energy needs of dairy cows.

Pastoralism became necessary as a nomadic feature of agriculture that involves the movement of people (herders) and animals (herds) from one location to another in pursuit of optimum grazing sites in terms of fresh pastures and water (Moran, 2006) for ruminant livestock. With an estimated 20.5 million cattle, Nigeria has the most livestock population in West Africa (FAOSTAT, 2018), and the Fulani pastoralists make up the majority of the nation's agro-pastoralists, even though they account for only 4% of Nigeria total population (World Atlas, 2017). They live as transhumant agro-pastoralists who migrate animals from a stable base periodically (Azuwike and Enwerem,

2010; Iyayi *et al.*, 2003; Blench, 2001), while living in heterogeneous community consisting of several Fulani clans, subclans, local cultures, languages, and differences in herding methods. Specifically, there are three categories of Fulani's; settled Fulani (who are ancestors to the Hausa land's aristocratic elite), semi-sedentary Fulani (who are usually agro-pastoralists), and a limited number of nomadic pastoral Fulani (who survive primarily off their herds). In a study by Uhembe (2015), pastoralists in the region were described as making up of two categories, the resident pastoralists and the mobile armed pastoralists. While the former group is fully integrated into their host communities to the extent of speaking their languages and intermarrying with them, the latter group is comprised of the Bokolo or Bururu who are militants, armed enough to coerce their hosts to inflict mayhem usually fueled by land and water use, religion, boundary disputes, manipulations by politicians, with the new entrant on stage being the magnitude of killings carried out by the herdsmen (Campbell, 2016).

Therefore, even though the history of livestock keeping has long been a part of the pastoralists' economy, changes in land use, increased agricultural activities, increasing population, climate change, and desertification have coerced pastoralists to move south as the savannahs become less suitable (Roma, 2008; Mwiturubani and Van-Wyk, 2010; Young and Goldman, 2015). Conventionally, land is one of the most important and attractive resources for pastoralists to settle, while charcoal making, selling of milk and milk products, petty trading, daily labourers, commercial livestock, cultivation of crops for food and security guards serves as a major diversification strategy. However, one of the primary restrictions encountered by agro-pastoralists (i.e. Fulanis) is access to safe land, which has long been a policy problem in Nigeria, with progress in attaining this not being evident. Particularly, according to literature experts, land accessibility by Fulanis who have lived among the Yorubas in Southwest Nigeria is entirely dependent on land right regimes existing within Yoruba communities. Thus, pastoralists tend to adopt agro-pastoral tendencies, veering into the combination of crop farming with the rearing of livestock, implying that they may take up residence for specific periods in areas which they deem conducive at any point. These are some of the harmless mechanisms known to

characterize Fulani pastoralism which involved a naturalization process spanning the pre-colonial era to the post-colonial era, through which they became an identifiable group in Nigeria, until recently where the evolution of their tactics has led to the need for a reconsideration of their activities. This perspective arise from the role of the herdsmen in fueling the spate of ethno-religious and political conflicts and upheavals that have engulfed sections of the country in recent years. Strangely it is the states with a sizeable Christian presence that have been subject to the most attacks by these rampaging Fulani herdsmen, thereby raising questions as to the actual motives behind the onslaughts. Thus, the specific objectives of this study were to: describe the socio-economic characteristics of agro-pastoralists; assess the livelihood diversification of agro-pastoralists; identify the various settlement patterns of agro-pastoralists; determine the benefits derived by agro-pastoralists from their settlements; and identify the challenges faced by agro-pastoralists based on their livelihood.

Hypothesis

H₀1: There is no significant relationship between livelihood diversification and settlement pattern of agro-pastoralists.

Methodology

This study was carried out in Ibadan/Ibarapa Zone; one of the four Agricultural Zones in Oyo State, Nigeria, with 11 Local Government Areas (LGAs). The other Zones are Oyo with 4 LGAs, Ogbomosho with 5 LGAs and Saki with 13 LGAs. The study population consists of all the agro-pastoralists in Ibadan/Ibarapa Agricultural Zone of Oyo State, Nigeria. A multistage sampling procedure was adopted in selecting the respondents for this study. The first stage entailed the purposive sampling of Ibarapa Central out of the 11 LGAs that constitute the Agricultural Zone due to the dominance of agro-pastoralists in the LGA. This was followed by the random selection of two-thirds of the major agro-pastoralist settlements in Ibarapa Central LGA, giving ten agro-pastoralist settlements. The final stage entailed the proportionate selection of 15% of the agro-pastoralists in the selected settlements as detailed in Table 1, giving a sample size of 106 agro-pastoralists who provided the primary data used in this study.

Table 1: Sampling procedure for the study

S/no	Major Agro-Pastoralist Settlements	Population Size	Sample size (15% of population size)
1	Gaa Imeleke	85	13
2	Gaa Jagode	100	15
3	Gaa Akeroro	25	4
4	Gaa Sekere	80	12
5	Gaa Abuleoye	40	6
6	Gaa Obatade	70	11
7	Gaa Kondo	100	15
8	Gaa Apataaku	70	11
9	Gaa Abulepanu	50	8
10	Gaa Geeke	70	11
Total		690	106

Source: Pre-

Data were collected with the aid of interview guide which was pretested and validated as reliable for data collection. The data were then subjected to frequency counts, percentages, mean, standard deviation and Chi-square analytical techniques. The Chi-square mode 1 given by Taylor (2019) is expressed thus;

$$\chi^2 = \sum_{k=1}^n \frac{(e_k - f_k)^2}{e_k}$$

Where, χ^2 is the symbol for chi-square statistics, e_k denotes expected counts, and f_k denotes the observed counts.

Measurement of key variables

Livelihood diversification of agro-pastoralists: This was measured at nominal level using a 9-item scale consisting of livelihood activities on a 2 point response of Yes (1) or No (2).

Settlement patterns adopted by sampled agro-pastoralists: This was measured as a categorical variable at nominal level as nomadic = 1, sedentary = 2, transhumance = 3 and semi-transhumance = 4.

Benefits derived from settlement pattern of agro pastoralist: This was measured at nominal level with a 7-item scale on a 2 point response of Yes (1) or No (2). The 'Yes' response option implies that the respondents benefitted, while the 'No' response option indicated otherwise.

Challenges faced by agro pastoralists: This was measured with a 7-item scale with response options Very severe, Slightly severe and Not severe assuming scores of 3, 2 and 1 respectively. The items with mean severity score of at least 2.00 [(3+2+1)/3] were considered as severe challenges, while items with mean severity score below 2.00 were considered as not severe.

Results and Discussion

Socio-economic characteristics of sampled agro-pastoralist

Results in Table 2 reveal that most (92.5%) of the respondents were within the age range of 21 – 60 years, while only a 7.5% were older than 60 years, with mean age of 43 years. This shows that the agro-pastoralists are still within the economically active population. Being young, they are characterized as agile and have the capability to discharge their duty effectively. Most (94.3%) of the respondents were male, while only 5.7% were female. This implies that agro-pastoralism is dominated by men, probably because of the strenuous and tedious nature of the activities involved in the enterprise which can be better handled by men. This is in tandem with the position of Adesiji *et al.* (2012), who attributed male dominance to the fact that men are more agile and capable of engaging in laborious production

activities connected with their farming method than women. It however indicated that some women are now participating in a variety of agricultural tasks, including those traditionally associated with men. This could be as a result of the continued movement of able-bodied rural male inhabitants to peri-urban and metropolitan regions in pursuit of greener pastures. Conjugal relationship is highly revered among the agro-pastoralists with majority (87.7%) of who are married. Responses on educational status reveal that many (47.2%) of the pastoralist's attained primary education, while 22.6% had only nomadic education, 20.8% secondary education and 9.4% tertiary education. They all, however, are literate in Qur'anic education indicating a low level of literacy as stated also by Fabusoro *et al.* (2010). The findings from this study are in agreement with the findings of earlier studies (Kubkomawa *et al.*, 2017; Adebayo *et al.*, 2016) which reported that pastoral cattle production was dominated by married male persons who practiced Islam and are mostly within 31-50 years with limited formal educational attainment. Findings gathered from responses of agro-pastoralists in Table 2 show that majority (60.4%) are cattle owners. This could imply that the pastoralists sometimes take care of cattle belonging to other people who may not be Fulani, indicating different herding practices such as between family-based pastoralists and hired herders. Both have implications on peaceful coexistence in agricultural communities. The family-based pastoralists keep small family units who are focused on rearing and reproduction of family herd. Such pastoralists may be less prone to conflict as relations are maintained with host communities across family lines (UNOWAS, 2018). On the other hand, hired herders involved hiring young men who are given control of livestock and migrate without their families. Such pastoralists are more prone to destroying crops because they do not negotiate access to pasture with farming communities or other Fulani population. It was gathered that majority (77.4%) of them kept less than 50 cattle, while 17.9% had 51-100 cattle and very few (4.7%) had above 100 cattle. This implies that the sampled pastoralists were smallholder livestock farmers. Also, the highest proportion (38.7%) of the agro-pastoralists had household size of 6 – 10 persons with a mean household size of 8 persons. This conveyed that a typical pastoral family is relatively large and this large number of household members supplies the bulk of labour required for farming activities carried out by the pastoralist both for off- and on-farm activities. Results further revealed that 36.8% of the respondents had settled in the area for between 5 – 7 years, while, 27.4% had settled 8 -10 years, 19.8% between 2 – 4 years and 16.0% above 10 years. The mean year of settlement of the pastoralists was 6.45 years, which implies that they have been in the host communities for substantial period of time.

Table 2: Socio-economic characteristics of sampled agro-pastoralist (n = 106)

Socio-economic characteristics	Frequency	Percentage	Mean
Age (years)			
21-30	11	10.4	
31-40	47	44.3	
41-50	27	25.5	43.24
51-60	13	12.3	
>60	8	7.5	
Sex			
Male	100	94.3	
Female	6	5.7	
Marital Status			
Single	9	8.5	
Married	93	87.7	
Widowed	4	3.8	
Religion			
Islam	103	97.2	
Christianity	1	0.9	
Traditional	2	1.9	
Household Size			
1-5	44	41.5	
6-10	41	38.7	8.14
11-15	15	14.2	
>15	6	5.7	
Educational Status			
Primary education	50	47.2	
Secondary education	22	20.8	
Nomadic	24	22.6	
Tertiary education	10	9.4	
Occupational status			
Farming	76	71.1	
Trading	24	22.6	
Artisan	6	5.7	
Cattle ownership			
Yes	64	60.4	
No	42	39.6	
Herd size			
≤50	82	77.4	
51-100	19	17.9	
>100	5	4.7	
Years of settlement			
2-4	29	27.4	
5-7	39	36.8	6.45
8-10	21	19.8	
>10	17	16.0	

Source: Field Survey, 2019

Livelihood diversification of agro-pastoralists

The study reveals that majority of the agro-pastoralists diversified into the cultivation of crops for food (71.7%), commercial livestock selling (70.8%) and selling of milk and milk products (63.2%). The least livelihood activities of the pastoralists were charcoal making, daily labour, transportation service, security guards and selling of veterinary drugs. This implies that the pastoralists have diversified well into other income generating/livelihood activities that could either support their household income or livelihoods. Since the

pastoralists also cultivate crops, it may be difficult for them to intentionally allow their cattle to graze on farmers' crops. Furthermore, it was revealed that the age-old feud has significantly widened the socioeconomic divide between the Fulani and other cattle producing tribes in Nigeria and sub-Saharan Africa in general. Therefore, the major livelihood activities of agro-pastoralist in the study area were cultivation of crops for food, commercial livestock selling and the selling of milk and milk products.

Table 3: Livelihood diversification of agro-pastoralists (n = 106)

Livelihood activities	Frequency	Percentage
Charcoal making	15	14.2
Selling of milk and milk products	67	63.2
Cultivation of crops for food	76	371.7
Petty trading	40	37.7
Daily labourers	15	14.2
Commercial livestock selling	75	70.8
Selling of veterinary drugs	15	14.2
Transportation service	17	16.0
Security guards	19	17.9

Source: Field Survey, 2019

Settlement patterns adopted by sampled agro-pastoralists

Result from Table 4 shows that more than half (55.7 %) of agro pastoralist practiced semi-transhumance settlement pattern in the area sampled, while 25.5% are into transhumance pattern with very few (2.8%) into sedentary pattern. This implies that almost all of the sampled agro-pastoralists either practiced transhumance or semi-transhumance. This is in tandem with UNOWAS (2018) which observed that agro-pastoralists have increasingly been migrating permanently or seasonal transhumance southward from northern states in search of more favourable grazing conditions. Transhumance is frequently connected with

the cultivation of some crops; which are largely for the use of herders rather than for the market. The findings further indicated that those with purely nomadic lifestyle are a minority among pastoralists in Nigeria. UNOWAS (2018) submitted that semi-settled, transhumance pastoralists are more common in Nigeria. Transhumance pastoralists maintain a permanent homestead and base where the community's elders spend the whole year. There is a significant link with greater rainfall zones; if the precipitation is such that the existence of fodder is not an issue, herders can afford to establish permanent relationships with certain locations, such as erecting homes.

Table 4: Distribution of sampled agro pastoralist based on their settlement pattern

Settlement pattern	Frequency	Percentage
Nomadic	1	0.9
Sedentary	3	2.8
Transhumance	27	25.5
Semi-Transhumance	59	55.7

Source Field Survey, 2019

Benefits derived from settlement pattern of agro pastoralist

Table 5 revealed that most of respondents indicated they benefited from equitable access to land (90.6%), expansion of business trade (76.4%) and market integration (71.7). Majority (60.4%) also benefitted

through increasing regional interconnectivity. This implies that through the settlement patterns, the agro pastoralists are able to gain access to equitable access to land, business expansion, market integration and regional interconnectivity.

Table 5: Benefits derived from chosen settlement pattern on livelihood activities of agro-pastoralist

Benefits	Frequency	Percentage
Equitable access to land	96	90.6
Access to water resources	25	23.6
Secure land use systems	33	31.1
Protection of pastures from encroachment	48	45.3
Expansion of business trade	81	76.4
Integration of markets	76	71.7
Increasing regional interconnectivity	64	60.4

Source: Field Survey, 2019

Challenges faced by agro pastoralists

The challenges faced by agro-pastoralists are presented in Table 6. Results reveals that majority of the agro-pastoralists indicated cattle defecating on streams and roads (78.3%), extensive sedentarization (80.2%), farmland invasion by cattle (85.8%), and overgrazing on fallow lands (80.2%) as severe challenges encountered by them. Other severe challenges include; expansion of

farming on pastures (64.2%), burning of range land (62.3%) and destruction of lives and properties (55.7%). The mean values of severity of the challenges ranked defecation on streams and roads by cattle ($\bar{x} = 2.36 \pm 0.27$) as the most severe challenge, followed by invasion of farmlands by cattle ($\bar{x} = 2.34 \pm 0.29$), extensive sedentarisation ($\bar{x} = 2.20 \pm 0.33$) and overgrazing on farmlands ($\bar{x} = 2.20 \pm 0.31$). According

to Genyi (2014) and Uhembe (2015), expansionist tendencies can be expressed in circumstances where the pastoralists either move to claim ownership of the lands which were allocated to them by host communities on trust based on predetermined agreements, or under the guise of being driven by the concerns for the well-being of their herds, trespass into the farmlands and farm produce of their hosts and adjoining communities. Instances of this have been experienced in Southern Kaduna where some of the communities were overrun by Fulani pastoralist/militant groups had come to be

inhabited by them since the natives had been too scared to return to their homes, further fuelling the greed and expansionist perspective on the crises (Jacobs, 2017). As Campbell (2016) pointed out, the situation is made grimmer by the fact that the Nigerian state is already grappling with her sovereignty being threatened by BokoHaram insurgency in the Northeast. The deployment of substantial military and material resources to the region has taken a toll on the capacity of the military forces, thereby leaving a window for violence to thrive.

Table 6: Distribution of agro-pastoralist according to severity of challenges

Challenges	Very severe	Slightly Severe	Not severe	mean±SD
Defecation on streams and roads by cattle	61(57.6)	22(20.8)	23(21.7)	2.36±0.27
Extensive sedentarisation	41(38.7)	45(42.5)	20(18.9)	2.20±0.33
Invasion of farmlands by cattle	51(48.1)	40(37.7)	15(14.2)	2.34±0.29
Overgrazing on fallow land	42(39.6)	43(40.6)	21(19.8)	2.20±0.31
Expansion of farming on pastures	33(31.1)	35(33.0)	38(35.9)	1.95±0.51
Burning of range land	24(22.6)	42(39.6)	40(37.7)	1.85±0.55
Destruction of lives and properties	27(25.5)	32(30.2)	47(44.3)	1.81±0.77

Source: Field Survey, 2019

Relationship between livelihood diversification and settlement patterns of agro-pastoralists

The results of the stated hypothesis tested at 0.05 levels of significance with non-parametric chi-square analytical technique were presented in Table 7. It reveals that there were significant association between settlement patterns and livelihood diversification; selling of milk and milk product ($\chi^2 = 12.248, p \leq 0.01$), cultivation of crops ($\chi^2 = 15.362, p \leq 0.01$), petty trading

($\chi^2 = 7.957, p \leq 0.05$) and commercial selling of livestock ($\chi^2 = 9.456, p \leq 0.05$). This implies that agro-pastoralists who adopted either the nomadic or sedentary lifestyle may not be able to diversify into certain livelihood activities such as cultivation of food crops or petty trading, while those with either transhumance or semi-transhumance lifestyles can easily combine different livelihood activities as a result of their settlement patterns.

Table 7: Chi-square results of the associations between livelihood diversification and settlement patterns of the respondents

Livelihood activities	Chi-square value	df	p-value
Charcoal making	4.605	3	0.351
Selling of milk and milk product	12.248	3	0.001***
Cultivation of crops for food	15.362	3	0.001***
Petty trading	7.957	3	0.049**
Daily labourers	3.002	3	0.174
Commercial livestock selling	9.456	3	0.025**
Selling of veterinary drugs	1.821	3	0.114
Transportation service	0.339	2	0.495
Security guards	2.362	3	0.062

*df = degree of freedom, *indicates significant association at $p \leq 0.01$, **indicates significant association at $p \leq 0.05$*

Conclusion

Livestock production is a crucial economic and social enterprise for the Fulani agro-pastoralists in Nigeria, and land availability is a key element determining both their livelihood activities and settlement patterns. This study deduced that agro-pastoralism was dominated by smallholder herders who were married and within the economically active age category. The agro-pastoralists who mainly practiced either the transhumance or semi-transhumance settlement patterns diversified well into cultivation of food crops, selling of milk and milk products, and commercial selling of livestock (e.g. cattle). They benefited from their settlement patterns through equitable access to land, expansion of business trade and market integration. Based on the findings from this study, it was concluded that the transhumance or

semi-transhumance settlement patterns adopted by the agro-pastoralists had positive influence on their livelihood diversification into different activities. It is therefore recommended that agro-pastoralists should diversify into more income generating livelihood activities. Furthermore, Federal and State legislators should update and enhance grazing reserve laws. Such laws should establish clear demarcations between farmlands and grazing lands in order to curb the menace of farmers-herdsmen conflicts arising from invasion of farmlands by livestock. The government should encourage agricultural expansion, particularly food crops production, by providing subsidized farm inputs on time and boosting irrigation operations in areas with such potential.

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