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RESEARCH ARTICLE

Challenges of Agroforestry Farmers with Herdsmen in Ekiti State, Nigeria

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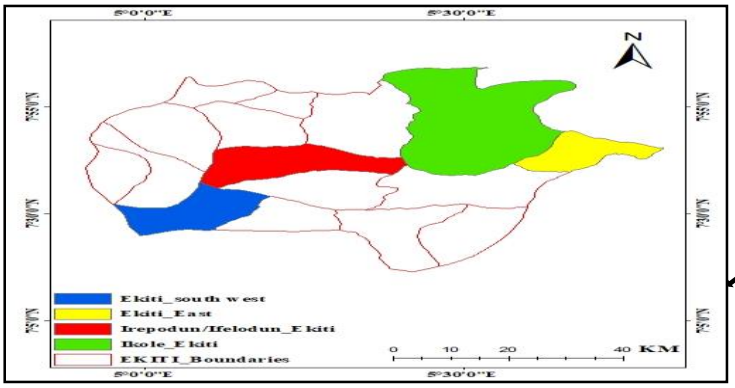
ABSTRACT

Changes in climatic conditions, soil degradation and the destructive actions of herders on agroforestry farmers' crops are some of the myriad challenges threatening rural people's livelihoods. This study was carried out to evaluate the effects of open cattle grazing on the activities of agroforestry farmers in Ekiti State. A multistage random sampling technique was used for sampling the respondents in the study area. One hundred and twenty pre-tested questionnaires were administered to respondents for collection of data. Information obtained from the study revealed that the majority of the respondents are married (80.8 %), male (80 %). The study revealed that 32.5 % of the respondents are above 50 years old with 40 % operating farm size of 1-5 hectares acquired through inheritance (83.3 %). Crops such as cassava, maize, yam and cocoyam are popularly grown in the study area. Provision of food (29.4 %) and income generation (25.2%) are the major contributions of agroforestry to respondents' livelihood in the study area, while browsing (27.7 %), trampling (26.2 %) and uprooting (26.2 %) were the major damages caused by herders' cattle to farmers' crops. Verbal warning (46.2 %) was the major measure adopted by the respondents to control herdsmen incursion into their farm while registration of herdsmen with the government ranked first (1st) among the suggested strategies to control herders' activities. It was recommended that anti-grazing offices should be established in every local government for prompt report of any possible attack from the herdsmen.

1. Introduction

In many developing nations, including Nigeria, agriculture and pastoralism have long been the primary sources of income, fostered by reciprocal, interdependent relationships [1]. This trend continues in emerging nations like Nigeria, Ghana, Cameroon, Tanzania, and Kenya, where both rural and urban populations rely heavily on agricultural produce and livestock for sustenance. According to IFAD and UNEP [2], smallholder farmers in Asia and sub-Saharan Africa contribute significantly to food security, producing 80% of the food they consume. Historically, there existed a harmonious and mutually beneficial relationship between farmers and herders, but this dynamic has shifted in recent years, leading to deadly conflicts [2]. Traditionally, this harmony was most evident between traditional agroforestry farmers and [3]. However, intensive pastoralism has begun to negatively impact arable farming in Nigeria [4]. The subsistence nature of farming and the small scale of herding allowed for ample land for both groups, fostering peaceful coexistence. However, the increasing frequency and violence of disputes threaten peace, food security, the economy, and the livelihoods of rural farmers. What was once a cordial relationship between farmers and herders is deteriorating into atrocities, leading to loss of lives and property and posing a threat to national unity [5]. Open cattle grassing has triggered a lot of problems in Ekiti State, and Nigeria in general. The destruction of agroforestry farmers' crops by cattle and the attack of herders has inflicted fear psychologically on the rural populace to the extent that most farmers have deserted the rural communities where their occupation was based [6, 7]. The previous peaceful coexistence and cordiality between traditional agroforestry farmers and herders in Ekiti State seems to have suffered and continues to

suffer an unbearable setback in their entrepreneurial practice and causing high poverty among people.



The severity, frequency, and geographic extent of these incidents have increased significantly and rapidly over the past decade. The influx of pastoralists into Ekiti State, which boasts abundant vegetation suitable for pastoralism, is likely to have some effects [8]. The frequent destruction of farmland by pastoralists and the ensuing confrontations are negatively impacting the production of arable crops and the livelihoods of rural agroforestry farmers. The conflict between agroforestry farmers and herders has escalated due to the large-scale migration of herdsmen to the fringes of the humid forest zone in southwest Nigeria. The severity, frequency, and geographic reach of these incidents have all escalated dramatically and swiftly in the last ten years. The high level of open grazing of cattle in Ekiti State by herdsmen has heightened fears among the populace. The hostility posed by open grazing has eaten deep into the economy and has now become a veritable threat to public safety and food security in the State. Olaleye et al. [9] noted that herders encounter problems with the local people because their cattle destroyed their crops. It is against this background, that this study is being conducted to outline the pressing challenges facing smallholder agroforestry farmers due to herdsmen activities in the state.

2. Materials and Methods

2.1 The Study Area

The study took place in Ekiti State, situated in southwest Nigeria. It is bordered to the south by Kwara and Kogi States, to the west by Osun State, and to the east and south by Ondo State. Ekiti State lies between latitudes 7°51' and 8°51' north of the equator and longitudes 4°51' and 5°45' east of the Greenwich meridian. The region experiences a monsoon-style climate typical of West Africa, characterized by distinct dry and rainy seasons. The wet season, lasting from late March to October, brings sporadic strong winds and thunderstorms, with its onset and conclusion typically aligning. The dry season, usually spanning November to March, is marked by the chilling Harmattan wind. The landscape is dominated by numerous hills of varying sizes, giving the cities and villages a picturesque setting. Annual rainfall ranges from 1,200 mm to 1,500 mm, and temperatures fluctuate between 21°C and 32°C. Relative humidity averages nearly 90% at 7:00 am and around 65% at 4:00 pm throughout the year.

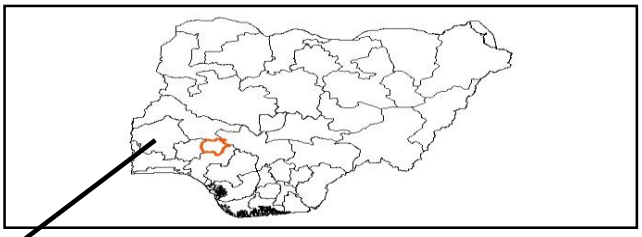


Figure 1: Map of Ekiti State showing the study area.

2.2 Sampling Procedure, Data Collection and Analysis

A multistage sampling technique was used for the study. The study area was stratified into two zones viz; the derived savanna to the northern peripheries and the rainforest zone to the southern part. Four local governments were randomly selected out of the sixteen local government areas of the state to give a 25% sampling intensity. Two communities were randomly selected in each of the sampled local governments to give a total of eight communities. Fifteen (15) respondents from each of the selected communities were sampled for interview making a total of 120 respondents. (Table 1). A pre-tested, semi-structured questionnaire was administered to the respondents. Data collected was analyzed using descriptive statistics of frequency table and percentage distribution.

3. Results

3.1 Socio-economic Characteristics of Respondents

Results on Table 2 showed that 80 % of the respondents are male while 20 % are female in the in the study area. Majority of the respondents (67.5 %) are above 40 years while 80.8 % are married with family size of 5-8 accounting for 52.5 %. Respondent's level of education shows that 60 % of the respondents have at least secondary education.

3.2 Agroforestry Practices

Table 3 revealed that 40 % of the respondents in the study area operate on an average farm size of 1-5 hectares while another 33.3 % operate average farm size of 6-10 hectares. The study also showed that 60.8 % of the respondents have over 15 years of farming experience while majority of the respondents 83.3 % acquired their land through inheritance. Respondents' source of labour revealed that 41.9 % do the work themselves while 26.7 % engaged haired labour. The result on crops planted by the respondents showed that cassava, yam, maize, cocoyam, vegetables and pepper with 10.9 % each are the crops mostly cultivated (Table 4).

3.3 Contribution of Agroforestry to Household Livelihood

The result in Table 5 showed that provision of food (29.4 %) and income generation (25.2 % were the major contributions of agroforestry to respondents' livelihood in the study area.

3.4 Damage to Farmers' Crops and Control Measure Against Herdsmen Activities

The result in Table 6 revealed that browsing (27.7 %), trampling (26.2 %), uprooting (26.2 %) and grazing (19.9 %) were the damages done to respondents' crops by the herdsmen. While the study revealed that verbal warning (46.2 %) and planting of melon (37 %) were some of the measures employed by agroforestry farmers to checkmate the activities of herders on their farms (Table 7).

Table 1: Distribution of respondents in the study area.

Vegetation zone	Local government	Towns	No of respondents
Rain forest	Irepodun/Ifelodun	Afao-Ekiti	15
		Iyin- Ekiti	15
	Ekiti south west	Igbaraodo-Ekiti	15
		Ilawe-Ekiti	15
Derived savannah	Ilejemeje	Ikole-Ekiti	15
		Ayedun-Ekiti	15
	Ekiti east	Omuo-Ekiti	15
		Ilasa-Ekiti	15
Total	**4**	**8**	**120**

Table 2: Distribution of respondents by Socio-economic characteristics.

Gender	Rainforest	%	Derived savanna	%	Total	%
Male	46	76.7	50	83.3	96	80
Female	14	23.3	10	16.7	24	20
Age						
≤30	4	6.7	8	13.3	12	10.
31-40	13	21.7	14	23.3	27	22.5
41-50	20	33.3	22	36.7	42	35
Above 50	23	38.3	16	26.7	39	32.5
Religion						
Islam	15	25	17	28.3	32	26.7
Christianity	42	70	37	61.7	79	65.8
Traditional	03	5	06	10	09	7.5
Marital status						
Single	11	18.3	12	20	23	19.2
Married	49	81.7	48	80	97	80.8
Household size						
≤4	26	43.3	24	40	35	29.2
5-8	29	48.3	34	56.7	63	52.5
> 8	5	8.3	2	3.3	22	18.3
Educational level						
No Formal Education	3	5	7	11.7	10	8.3
Primary	18	30	20	33.3	38	31.7
Secondary	30	50	27	45	57	47.5
Tertiary	9	15	6	10	15	12.5
Total	**60**	**100**	**60**	**100**	**120**	**100**

Table 3: Distribution of respondents by farm Practices

Farm size (hectares)	Rainforest	%	Derived savanna	%	Total	%
≤5	26	43.3	22	36.7	48	40
6-10	15	25	25	41.7	40	33.3
11-15	10	16.7	7	11.7	17	14.2
16-20	6	10	4	6.6	10	8.3
>20	3	5	2	3.3	05	4.2
Years of experience						
≤5	03	5	02	3.3	05	4.2
6-10	09	15	08	13.3	17	14.2
11-15	12	20	13	21.7	25	20.8
16-20	16	26.7	14	23.3	30	25
>21	20	33.3	23	38.3	43	35.8
Land Ownership						
Inheritance	51	85	49	81.7	100	83.3
Gift	03	5	01	1.7	4	3.3
Leasehold	01	1.7	03	5	4	3.3
Purchase	05	8.3	07	11.6	12	10
Total	**60**	**100**	**60**	**100**	**120**	**100**
Source of labour						
Self	48	36.4	60	47.6	108	41.9
Haired labour	33	25	36	28.6	69	26.7
Group	25	18.9	12	9.5	37	14.3
Family member	26	19.7	8	14.3	44	17.1
Total	**132***	**100**	**126***	**100**	**258***	**100**

*Multiple responses

3.5 Suggested Strategies to Mitigate Agroforest-farmers/ Herders Conflicts.

The result in Table 8 showed suggested ways by which conflicts between farmers and herders can be mitigated. Registration of herdsmen with the government ranked 1st followed by educating herders on how to grow pasture all year round in the 2nd position, while mass and compulsory western education and creation of dedicated grazing areas for pastoralism were ranked 3rd.

4. Discussion

Observation from this study reveals that most respondents were between 41-50 years of age. This suggests that the agroforestry farmers in the research region were still rather active. It is anticipated that this will have a favorable effect on the respondents' ability to produce crops for increased food security. This implies that agroforestry farmers in the study area were still in their active age. This is expected to positively impact respondents' capacity for crop production for improved food security. The preponderance of male respondents pointed to the fact that farming activities are laborious and require hefty men. The level of education of the respondents with the majority having at least secondary education could have been responsible for the high level of understanding been displayed by agroforest farmers in the handling of issues with pastoralists so as to prevent or minimize conflicts among the two groups in the study area.

Land ownership mostly through inheritance could be the reason for the small farm size operated by the respondents, since this method always leads to land fragmentation. This could restrict authority and decision-making about infrastructure, such as fences to keep pastoralists from invading farmland. Similar assertion was reported by Jamala, et al. [10]. Also, land ownership by inheritance could be the reason why the respondents in the study area are mainly peasant farmers. These categories of farmers are usually vulnerable to devastating shocks that may arise from any unpleasant situations such as destructive activities of pastoralists, prolong draught and fire outbreak. This assertion corroborates the report by Blench [11] that herdsmen activities caused a lot of damage to farmers' crop. Results on years of farming experience reveal that agroforestry farmers in the study area are well experienced with the majority having practiced for over 16 years.

Table 4: Distribution of respondents by food crop planted

Food crops	Rainforest	%	Derived savanna	%	Total	%
Cassava	60	11.6	60	10.2	120	10.9
Yam	60	11.6	60	10.2	120	10.9
Maize	60	11.6	60	10.2	120	10.9
Beans	24	4.6	51	8.7	75	6.7
Cocoyam	60	11.6	60	10.2	120	10.9
Groundnut	36	6.9	48	8.2	84	7.6
Vegetables	60	11.6	60	10.2	120	10.9
Potatoes	49	9.4	56	9.6	105	9.5
Rice	38	7.3	45	7.7	83	7.5
Sugarcane	12	2.3	17	2.9	29	2.6
Paroparo	00	00	09	1.5	09	0.8
Pepper	60	11.6	60	10.2	120	10.9
Total	**519***	**100**	**586***	**100**	**1,105***	**100**

*Multiple responses

Table 5: Distribution of respondents by agroforestry contribution to household livelihood

Agroforestry contribution	**Rainforest**	**%**	**Derived savanna**	**%**	**Total**	**%**
Income generation	47	22.9	56	27.6	103	25.2
Provision of food	60	29.3	60	29.6	120	29.4
Insurance against crop failure	45	22	38	18.7	83	20.3
Economy of labour	53	25.8	49	24.1	102	25
Total	**205***	**100**	**203***	**100**	**408***	**100**

*Multiple responses

Table 6: Distribution of respondents by damages caused by the herdsmen

Damages	**Rainforest**	**%**	**Derived savanna**	**%**	**Total**	**%**
Trampling	55	27.5	58	25	113	26.2
Browsing	60	30	60	25.9	120	27.7
Grazing	32	16	54	23.2	86	19.9
Uprooting	53	26.5	60	25.9	113	26.2
Total	**200***	**100**	**232***	**100**	**432***	**100**

*Multiple responses

Table 7: Distribution of respondents by control measure

Control measure	**Rainforest**	**%**	**Derived savanna**	**%**	**Total**	**%**
Planting of melon	31	34.4	42	39.3	73	37
Boundary setting	10	11.1	15	14	25	12.7
Net setting	3	3.3	5	4.7	8	4.1
Verbal warning	46	51.1	45	42	91	46.2
Total	**90***	**100**	**107***	**100**	**197***	**100**

*Multiple responses

Observation from this study revealed that agroforestry contributes greatly to household livelihood especially in the area of food security. Provision of food constitutes one of the most basic livelihoods criteria especially in rural households. Other

benefits of agroforestry as revealed from the study include the production of fuel wood, staking material, timber, provision of medicinal herbs and soil fertility improvement among others. Crops such as cassava, yam, maize, cocoyam and vegetables are planted by agroforestry farmers to ensure regular supplies for household needs. This assertion has similarly been reported by Olujobi et al. [12]. The various damages caused by herdsmen to farmers' crops by way of browsing, trampling and uprooting, especially the tuber crops could lead to reduction in crop yield and consequently food scarcity and reduced income. The fear of possible attack from herdsmen also has great impact on the number of hours and days spent on the farm. This no doubt comes with negative consequences on food crop production thereby increasing the poverty level of poor subsistence agroforestry farmers.

Table 8: Strategies for Mitigating Conflicts

Mitigation strategies	**Strongly Agree (4)**	**Agree (3)**	**Strongly Disagree (2)**	**Disagree (1)**	**Weight score**	**Mean index**	**Rank**
Grazing areas should be created and dedicated to pastoralism.	21	75	12	10	343	2.86	3rd
Farmers should fence off their farmland	3	10	20	68	150	1.25	5th
Setting up securities post at the border to prevent herdsmen into the study area	2	28	57	32	238	1.98	4th
Educating herders on how to grow pasture all year round.	54	34	15	7	355	2.96	2nd
All herdsmen should register with the government.	112	8	0	0	472	3.93	1st
Compulsory western education for young herders.	35	63	5	4	343	2.86	3rd

Prominent among measures adopted by agroforestry famers to dowse tension of possible conflicts with herdsmen in the study area is verbal warnings. This was made possible probably because of the educational level of the respondents. In this case agroforestry farmers and the herdsmen dialogue together. Implementing these procedures can be instrumental in preventing conflicts of interest between crop producers and pastoralists, considering their direct involvement [12]. However, dealing with certain herdsmen can be challenging due to their unpleasant and belligerent behavior. They often destroy agricultural crops under the cover of night and disappear before daybreak, making it difficult to achieve desired outcomes. Registration of herdsmen with the relevant government agency and educating herders on how to grow pasture all year round were some of the strategies suggested to mitigate challenges posed for agroforestry farmers by herdsmen.

5. Conclusion and recommendations

The result from this study has shown that the majority of the respondents in the study area are married males with at least secondary education. The majority of the respondents have farm size of 1-5 hectares acquired through inheritance. The result also revealed that crops like cassava, maize, yam, cocoyam, vegetables and pepper are popularly grown by the respondents in the study area while *Gliricidia sepium* is the most favoured tree species planted.The major uses and contributions of agroforestry to respondents' livelihood are fuelwood production and the provision of food. The major damage caused by herdsmen to agroforestry farmers' crops is browsing with its attendant negative impacts on employment and income generation. The control measure adopted by the respondents against herdsmen incursion into their farms is by verbal warning while registration of herdsmen with the government ranked first (1st) among the suggested strategies to reduce herdsmen challenges. In the light of the above it is recommended that government should endeavour to establish ranches with adequate facilities to reduce open grazing and indiscriminate movement of cattle on roads. Furthermore, Anti-grazing offices should be established in every local government where agroforestry farmers can easily make a report of any possible attack from herdsmen.

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