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Analysis of Perceived Causes and Consequences of Herders–Farmers Conflicts on Cassava and Yam Production in Southeast Nigeria

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Abstract
This study examined perceived causes of herder–farmer conflicts in Southeast Nigeria and their economic consequences for cassava and yam production. Primary data were collected from a random sample of 240 farmers using structured questionnaires, interviews, and focus group discussions. Descriptive analysis identified the principal perceived drivers as crop destruction by cattle ($\bar{x}$ = 3.94), water pollution ($\bar{x}$ = 3.90), sexual harassment of women by herders ($\bar{x}$ = 3.85), and competition for land and water ($\bar{x}$ = 3.80). Respondents reported economic impacts that included farm abandonment ($\bar{x}$ = 3.26), reduced cultivated area ($\bar{x}$ = 2.62), and decreased crop output ($\bar{x}$ = 3.89). Simple linear regression analyses showed a statistically significant negative association between conflict and cassava production ($\beta = -0.007$, $p < 0.05$) and between conflict and yam output ($\beta = -0.002$, $p < 0.05$), suggesting that higher perceived conflict levels are associated with lower production of these two tuber crops. Since the study adopted a cross-sectional data design and the regression analysis was based on perception scores, these findings indicate association rather than causation, as other unmeasured factors may also affect cassava production in the study area. The study recommends strengthening local conflict-resolution mechanisms, improving land-use management and policies, and implementing targeted security measures to reduce crop losses and encourage return to cultivation.
Keywords: Herder-farmer, conflict, Cassava production, Yam production, Economic impact

Introduction

Conflict is a struggle between groups over scarce resources, rights, or interests. Herders–farmers conflict is a recurring clash between pastoralists and crop farmers over access to land, water, and other shared resources, and it increasingly undermines livelihoods, national food security, and social cohesion. Farming activities in Southeast Nigeria are similarly affected by escalating herder–farmer disputes, which tend to disrupt production of staple crops such as cassava and yam and thereby threaten household and national food security, rural incomes, and local markets. In recent years these disputes have intensified, producing violent clashes that have caused loss of life, population displacement, and economic setbacks (Okibe, 2022). Several factors have contributed to this escalation, including climate change, which has exacerbated environmental problems such as desertification and the shrinkage of vital water bodies like Lake Chad, compelling some herders to migrate southward into the more fertile lands of Southeast Nigeria (Awo,2020).

According to Daniel (2021), this movement increases competition over land and water with settled farmers and often culminates in disputes and violence. Additionally, the encroachment of grazing routes by expanding agricultural activities and infrastructure development has further strained relations between these communities (Skabash, 2021). Despite a growing literature on the causes and impacts of herder–farmer conflicts in sub-Saharan Africa and increased documentation of violent incidents and local disputes, systematic evidence remains limited on how farmers themselves perceive the drivers of these conflicts and on the concrete economic consequences for key root crops in the region. There is a notable research gap for comprehensive, context-specific analyses focused on Southeast Nigeria, where understanding regional specificity is crucial for developing effective, locally tailored conflict-resolution and peace-building strategies (Okibe, 2022). Hence, this paper analyses farmers' perceived causes of herder–farmer conflicts in Southeast Nigeria and assesses the economic consequences for cassava and yam production.

Methodology

The study was carried out in Southeast Nigeria, which comprises five states: Abia, Anambra, Ebonyi, Enugu, and Imo. A multistage sampling technique was used to select 240 farmers. In the first stage, three states with rising incidences of herder–farmer conflicts—Abia, Ebonyi, and Enugu—were purposively selected. In the second stage, two LGAs were purposively chosen from each of those states, yielding six LGAs. In the third stage, four communities were selected from each LGA (24 communities in total). Finally, with the assistance of community farmers' cooperative associations, 10 farmers were selected from each community using simple random sampling, producing a sample of 240 respondents. Data were collected through a structured questionnaire, in-depth interviews, and focus group discussions (FGDs), and were analyzed using descriptive and inferential statistics.

Model specification

Hypothesis 1 was tested using simple linear regression analysis in determining the effect of Herders-farmer conflict on the output of cassava crop production.

In implicit form, the model is specified thus:

$Y = f(X_1, e)$ …

Where:

Y = Cassava production (mean scores)

X = Perceived causes of farmer-herders conflict

e = error term.

Hypothesis 2 was tested using simple linear regression analysis in determining the effect of Herders – farmer's conflict on the yam crop production output.

In implicit form, the model is specified thus:

$Y = f(X_1, e)$ …

Where:

Y = Yam production (mean scores)

X =Perceived causes of farmer-herders conflict

e = error term.

Results and Discussion

Table 1: Mean rating of the perceived causes of herders / farmers conflicts in the study area

S/N	Causes of herdsmen/ farmers conflicts	Abia (n = 80)		Ebonyi (n = 80)		Enugu (n = 80)		Southeast (n = 240)	
		$\sum f(x)$	$\bar{x}$	$\sum f(x)$	$\bar{x}$	$\sum f(x)$	$\bar{x}$	$\sum f(x)$	Pooled $\bar{x}$
1	Destruction of crops by cattle	319	3.99	311	3.89	315	3.94	945	3.94
2	Water pollution sources by cattle	314	3.93	310	3.88	311	3.89	935	3.90
3	Ethnic rivalry	242	3.03	190	2.38	204	2.55	636	2.65
4	Change in pastoralism and farming practice	248	3.10	251	3.14	242	3.03	741	3.09
5	Indiscriminate bush burning	311	3.89	279	3.49	304	3.80	894	3.73
6	Inadequate pasture and grazing reserves	237	2.96	253	3.16	181	2.26	671	2.80
7	Killing of cattle and cattle rusting	214	2.67	244	3.05	190	2.38	648	2.70
8	Competition for the use of land and water bodies	312	3.90	304	3.80	295	3.69	911	3.80
9	Stealing of crops	235	2.94	242	3.03	247	3.09	724	3.02
10	Disregard to property rights of land and water	273	3.41	246	3.07	297	3.71	816	3.40
11	Religion / Cultural differences	234	2.93	197	2.46	189	2.36	620	2.58
12	Sexual harassment of women by herdsmen	316	3.95	296	3.70	312	3.90	924	3.85
13	Lack of system to deal with grievance	254	3.17	222	2.78	222	2.78	698	2.91
14	Harassment of herdsmen by the host youth	261	3.26	193	2.41	185	2.31	639	2.66
	Grand mean		**3.44**		**3.13**		**3.16**		**3.25**
	Decision mean cut-point		**2.50**		**2.50**		**2.50**		**2.50**

Source: Field Survey, 2023.

Perceived causes of the conflict between the herders and farmers

The result as presented shows that the mean scores of causes of conflict between farmers and herdsmen in Southeast, Nigeria were ($\bar{x}$ =3.44), ($\bar{x}$ =3.14) and ($\bar{x}$ =3.160) for Abia, Ebonyi and Enugu states respectively with a grand mean score of ($\bar{x}$ = 3.25) for the zone. The result also shows that eleven variables of the causes of the conflict in the study area had high mean scores of above three points while seven variables had scores below three but within the range of decision making since any mean score from 2.5 and above was regarded as a cause while any one below 2.50 was regarded as no cause. In this case, only one variable had a score below 2.50; encroachment of grazing reserve ($\bar{x}$ =2.47) which was regarded as no cause to herders-farmers conflict in the study area.

The variables with above three scores point were destruction of crops by cattle ($\bar{x}$ =3.94), cattle trespass ($\bar{x}$ =3.91), pollution of water sources ($\bar{x}$ =3.90), sexual harassment of women by herdsmen (3.85), competition for use of natural resources ($\bar{x}$ =3.80), indiscriminate bush burning ($\bar{x}$ =3.73), disregard to traditional rulers and land owners (3.64), disregard to property rights of land and water ($\bar{x}$ =3.40), change in pastoralism and farming practices ($\bar{x}$ =3.09) and stealing of crops by herdsmen ($\bar{x}$ =3.02) suggesting that they were regarded as causes of conflict.

In the context of the above variables, there exist significant impacts on the conflict and agricultural production. For example, cattle trespass onto farmlands leads to crops destruction and damage to agricultural produce resulting to financial losses for farmers, reduced crop yields and decreased agricultural productivity. Also, the presence of herders in farming communities can lead to instances of sexual harassment, creating a sense of insecurity and fear among women farmers. This can limit their mobility and access to farmlands, ultimately affecting productivity. More still, the increasing competition for natural resources, such as land, water and grazing areas, fuels tensions between farmers and herders. As herders seek to maintain their livelihoods, they may encroach on farmlands or protected areas, leading to conflicts with farmers and other stakeholders. These have far- reaching consequences on agricultural production, economic losses, social tensions and food insecurity particularly on cassava and yam production.

The findings are congruent with the study of Agyemang (2017) who asserted that the act of causing damage to farms and farm produce by the cattle and the herders is one of the main reasons for the tension between the farmers and herders. This result also conforms to the findings of Bukari, (2018) and Schilling, *et, al.* (2012) who argued that farmer- herder conflict mainly results from competition between farmers and herders over natural resources, particularly land, pasture and water. Supporting, Opoku (2014), observed that the causes of the farmer-herder conflict are raping of women on their farms, herdsmen causing bush-fires and pollution of water bodies by cattle.

Table 2: Mean rating of the perceived economic effects of herder-farmers conflicts on cassava and yam production in the study area

S/n	Economic effects of conflict on cassava Production	Abia (n = 80)		Ebonyi (n = 80)		Enugu (n = 80)		Southeast (n = 240)	
		$\sum f(x)$	$\bar{x}$	$\sum f(x)$	$\bar{x}$	$\sum f(x)$	$\bar{x}$	$\sum f(x)$	Pooled $\bar{x}$
1	Late farming	268	3.35	177	2.21	199	2.49	644	2.68
2	Abandonment of farmland	276	3.45	222	2.77	285	3.56	783	3.26
3	Reduction of access to extension services	231	2.89	169	2.11	176	2.20	576	2.40
4	Displacement of farmers	268	3.35	242	3.03	261	3.26	771	3.21
5	Reduce land area allocated to cassava production	252	3.15	182	2.28	195	2.44	629	2.62
6	Reduced Farm labour	253	3.16	198	2.48	182	2.28	633	2.64
7	Reduction of number of farming seasons	154	1.93	188	2.35	150	1.88	492	2.05
8	Loss of crops	319	3.99	314	3.93	318	3.97	951	3.96
9	Reduction in output	309	3.86	311	3.89	313	3.91	933	3.89
10	Discouraged farmers from cassava cultivation	316	3.95	309	3.86	317	3.96	942	3.92
	Grand mean		3.50		2.89		2.99		3.06
	Decision mean cut-point		2.50		2.50		2.50		**2.50**

Source: Field Survey, 2023.

Perceived economic effects of herder- farmer conflict on cassava and yam production

Table 2 presents the results of the investigation of the perceived economic effects of conflict on cassava and yam production on a four-point rating scale. The Table indicates the degree of damage done by the conflict in the study area. Conflict outcome experienced was actually determined as loss of crops (3.96), discourage farmers from cassava and yam cultivation (3.92),reduction in output (3.89), abandonment of farms (3.26), displacement of farmers (3.21), late farming (2.68),reduced farm labour (2.64),reduced land area allocated to cassava and yam production (2.62) which were considered as the major effects of conflict on crop production while reduction of

access to extension services (2.40) and reduction of number of farming seasons (2.05) with low weighted mean were perceived as the minor effect of conflict on cassava and yam production.
Under the activities of herders- farmer conflict, reduction in output of crop farmers occur as a result of indiscriminate bush burning and mindful destruction of crops by cattle which lead to either partial or total loss of crops by the farmers. The effect on crop yield therefore has negative impact on the affected farmer's output with its summary impact on the overall cassava and yam production. This is congruent with Agyemang (2017), who stated that with the increase of crops and farms destruction, as well as the harvested and stored foodstuff by cattle and bush burning, agricultural produce, including cassava and yam are reducing on the part of the farmers. The net effect has been cassava and yam production shortage and high cost of garri and fufu, and yam in the study area.

Hypotheses Testing

Effect of Herder-Farmer Conflicts on perceived economic effect on Cassava Production in southeast

Table 3. Simple linear regression estimates of the effect of-herder-farmer conflict on cassava production in the study area.

Variables	Coefficients	Std. error	t-value
Constant	6.962	0.358	19.428***
Cassava Output	-0.007	0.003	-2.573**
R^2	0.047		
Adjusted R^2	0.036		
F-ratio	6.623**		

Computed from field survey data, 2023
Key: ** and *** = Significant at 5% and 1% level of probability respectively
Decision: H0 Rejected at 5% level of significance

The result of the simple linear regression used to test the hypothesis that farmer–herder conflict has not significantly affected cassava production in Southeast Nigeria is presented in Table 3. The analysis shows a statistically significant relationship between the dependent variable (cassava production) and the independent variable (causes of farmer–herder conflicts). The coefficient for the constant term (6.962) represents the estimated cassava production score when conflict is absent. The coefficient for the conflict variable (−0.007) indicates that for every one-unit increase in conflict, cassava production decreases by 0.007 units. In practical terms, this means that as conflict intensifies, cassava production tends to decline slightly. This negative association suggests that conflict contributes to reduced cassava production in the study area, likely due to the destruction of farmland, disruption of farming activities, and loss of access to productive land during periods of unrest. Although the relationship is statistically significant at the 5% level ($t = -2.573$), the model explains only 4.7% of the variation in cassava production ($R^2 = 0.047$), indicating that other factors also influence production. Since the study adopted a cross-sectional design and the regression analysis was based on perception scores, these findings indicate association rather than causation, as other unmeasured factors may also affect cassava production in the study area. Therefore, we reject the null hypothesis and accept the alternative: there is a significant relationship between farmer–herder conflict and cassava production in Southeast Nigeria. These findings align with those of Oti, Onyia, and Umounyang (2017), and Sulaiman and Ja'afar-Furo (2010), who reported that farmer–herder conflicts contributed to reduced farm productivity, including cassava, in North Central Nigeria.

Farmer-Herders' conflict do not have significantly effect on the yam production output in Southeast.

Table 4: Simple linear regression estimates of the effect of farmer-herders conflict on yam production output in the study area

Variables	Coefficients	Std. error	t-value
Constant	6.503	0.186	35.044***
Yam Output	-0.002	0.001	-2.685**
R^2	0.035		
Adjusted R^2	0.028		
F-ratio	7.210^{**}		

Computed from field survey data, 2023

Key: ** and *** = Significant at 5% and 1% level of probability respectively

Decision: H0 Rejected at 5% level of significance

The result of the simple linear regression used to test the hypothesis that farmer–herder conflict do not have significant effect on yam production output in Southeast Nigeria is presented in Table 4.The analysis shows a statistically significant relationship between the dependent variable (yam production) and the independent variable (causes of farmer–herder conflicts). The coefficient for the conflict variable (-0.002) suggests that for each unit increase in farmers-herders conflict, yam production output decreases by 0.002 units. In practical terms, this means that as conflict intensifies, yam production tends to decline slightly. This negative association suggests that conflict contributes to reduced yam production in the study area, likely due to the destruction of farmland, disruption of farming activities, and loss of access to productive land during periods of unrest. The analysis indicates that the coefficient of herders- farmers' conflicts is negative and reduces yam production output in Southeast. This implies that there is positive association between farmer-herder conflict and yam production output in the study area.

Although the relationship is statistically significant at the 5% level ($t = -2.685$), the model explains only 3.5% of the variation in yam production ($R^2 = 0.028$), indicating that other factors also influence production. Since the study adopted a cross-sectional design and the regression analysis was based on perception scores, these findings indicate association rather than causation, as other unmeasured factors may also affect yam production in the study area.

The results suggest that farmer-herder conflict has a negative and statistically significant impact on yam production output in the study area. Therefore, we reject the null hypothesis and accept the alternative hypothesis that there is a significant relationship between farmers-herdsmen conflicts and yam production output in the study area. The findings conform to the studies of (Brinkman and Hendix 2011, USAID 2011 cited in Simmons 2013, Auma 2016 and Jeanty and Hitzhusen, 2006) which have shown that there is a positive relationship between violent conflict and reduced arable crop production.

Conclusion

The study concluded that herder–farmer conflicts substantially harm yam and cassava production in Southeast Nigeria through crop destruction, disruption of farming activities and productivity, and resulting economic losses. In practical terms, as conflict intensifies, it actually tends to decline agricultural productivity and these impacts threaten household livelihoods as well as local and national food security.

Recommendations

1. There should be established local mediation committees led by traditional and community leaders to resolve disputes quickly and restore trust for farmers to enable them to cultivate their farmlands.
2. Implement clear grazing rules and mapped corridors or reserves to separate seasonal grazing from cropland and avoid farmland destruction.
3. Strengthen community security to protect rural communities.
4. Provide rapid support to affected farmers (seeds, inputs, and extension services) to restore production after incidents.

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