

TRANSHUMANCE CRISIS AND FOOD SECURITY ISSUES IN SOUTHEAST NIGERIA: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT

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Abstract. *Food security in sub-Saharan Africa in recent history is beginning to experience alteration due to some factors such as transhumance-related crises in the region. Although transhumance is an age-long practice among developing nations, especially in sub-Saharan Africa, its relationship with farming and agricultural sustainability has gradually changed due to increasing politically motivated resource-access crises in the region. In this study, we investigated transhumance-related resource-access crises and food security management in southeast Nigeria. The study sample is made up of 625 rural farmers domicile with farmers' cooperative societies in the region. The study was guided by the Resource-Access Theory and survey research design; a questionnaire instrument was used in data gathering while percentage, correlation and regression statistics were deployed to assess the collected data. Among the major findings of the study, transhumance-related conflict negatively correlated with the four dimensions of food security in the region such as food production (p.000, r = -.386), food availability (p.000, r = -.325), food accessibility (p.000, r = -.376) and food stability (p.000, rho = -.389). Rural-urban food circulation is predicted by open grazing, herdsmen encroachment into the farm, farmers/herders clash, climate change indicators (***) p<.000, R²=.791), while agricultural sustainability is predicted by the age of the respondents, open grazing, herdsmen encroachment into the farmland, farmers/herders clash, climate change indicators as well as desertion of farmland because of herdsmen attacks (***) p<.000, R²=.876).*

Keywords: *transhumance-related crises, resource-access crises, food security management, climate change, agricultural sustainability, rural-urban food security.*

Reikšminiai žodžiai: *su ganyklomis susijusios krizės, išteklių prieinamumo krizės, aprūpinimo maistu valdymas, klimato kaita, žemės ūkio tvarumas, kaimo ir miesto aprūpinimas maistu.*

Introduction

Pastoralists and farming communities across the world have lived in the ancient times and the current historical epoch in more of a symbiotic relationship than a saprophytic relationship, owing to the indispensability of their essences to each other. While in the developed nations the closeness between the pastoralists and the farming communities has been drastically reduced by industrialization and advanced farming and herding techniques, in recent times in the developing nations such as in sub-Saharan Africa, the situation is more of crude nature and retains largely the closeness of the herders and the farmers in the rural communities where majority of the agricultural activities took place (Turner & Schlecht, 2019; Udeagbala, 2020; Okafor et al., 2023). This constant closeness has been exploited over the years by the duo with the absence of or minimal conflicts however, in recent times there has been a change in the indicators of this relationship with unwanted outcomes across sub-Saharan Africa (Krätli & Toulmin, 2020).

Due to poverty in sub-Saharan Africa, livestock management by seasonal movement has remained a dominant form of herds business with some socioeconomic implications (Gentle & Thwaites, 2016). These movements of livestock are adapted to areas where natural resource availability varied in time and space (Niamir-Fuller, 1999). Transhumance although underestimated across the globe, is one of the vital aspects of the economy of most developing nations, but it much depended on open grazing.

The transhumance form of livestock business is largely found in Africa, where about 268million pastoralists are engaged in the business, covering about 43% of the African land mass. Nonetheless, the livestock business is part of the agricultural sector, and contributes to approximately 40 to 50 percent GDP of the economy of most of the developing nations largely located in the African Sahel region; these contributions come as the wealth from animal products such as leather, milk, etc. (Food and Agricultural Organisation, 2019).

Majority of the population of sub-Saharan Africa nations, especially in the rural communities are herders and farmers per occupation (Nwakanma & Boroh, 2019; Food and Agricultural Organisation, 2015), prompting the ever-increasing incidences of herders/farmers clashes in the rural communities across the region. With the weak governance and compromised ethnic and religious interests, the nomenclature of the relationship between the herders and farmers has gradually changed, triggering constant tensions across the region (Brottem, 2021; Dimelu, Salifu, Enwelu & Igbokwe, 2017).

The herders/farmers conflicts, which are the outcome of the winding down of the symbiotic relationship between the duos, have resulted in a number of socioeconomic crises. Such crises as killings, destruction of properties and farmlands, devastation of the farmers from their farmstead and ancestral land, distortion of industrial activities and foreign investors, etc, have all impacted negatively on the Gross Domestic Products (GDP) of many sub-Saharan African nations (Yakubu et al., 2020; Okoro, 2018; Okafor et al, 2022). More importantly, the situation in some cases has developed into full-blown wars and ethnic cleansing across the region with lasting impacts on the economy such as in the area of food security (Antwi, 2018; Obasanmi & Enoma, 2022).

In Nigeria, herders/farmers conflicts over the years have lingered in northern Nigeria with Fulani ethnic group and others. While Fulani ethnic group is mostly known with cattle rearing business in the region, other ethnic groups in the region including Fulani are mostly known with farming business.. Lately, the herders/farmers clashes have shifted towards the southern axis such as southeast Nigeria where relatively significant percentage of the population is in the farming business, both subsistence and commercial farming (Gever & Essien, 2017). Across the Nigerian southeast region in recent times, poor governance compromised ethnic interests, and religious interests have gradually rubbed off the taste of a symbiotic relationship between the pastoralists and the farming communities, bringing undesirable results (Apeh, Opat, Amaechiand & Njoku, 2021).

There has been an increase in the influx of herders into southern Nigeria with most of them settling in southeast and southwest Nigeria. This has been attributed to the increase in the impacts of climate

change, which has started surfacing aggressively in northern Nigeria with drought and other indicators (International Crisis Group, 2018). While a number of studies have supported climate change as a culprit in the recent change in transhumance, especially in sub-Saharan Africa (Akinyemi & Olaniyan, 2017; Abugu, Bello, Odele & Amahagbor, 2021; Okafor et al., 2023; Onuoha & Ezirim, 2015), other studies have attributed the change in transhumance in the developing nations such as in sub-Saharan Africa to the poor governance and overriding interests of ethnicity and religion among these nations such as in Nigeria.

With the increase in transhumance in recent times towards southeast Nigeria, there have been incidents of transhumance-related conflicts such as the destruction of farm lands, killings, destruction of properties, rape and other criminal activities across the states in the region. These herdsmen take their livestock direct to feed on farm lands, destroying farm crops. They also convey their livestock on foot within rural settlement, urban centres thereby causing obstruction in the communities. When the residents complained, fights erupt, leading to killings. A number of studies have shown that in recent times across the southeast Nigerian region, herders/farmers conflicts have increased resulting to the destructions of properties and farmlands in such states as Enugu, Imo, Ebonyi, Abia and Anambra (Okafor et al., 2022). These transhumance-related conflicts have been attributed to certain factors relating to human behavioural dispositions including, struggle for access to natural resources, population explosion, climate change crises, political instability, ethnic rivalries as well as the clash of globalization and traditional mechanisms. These have invariably affected the global and regional efforts for sustainable peace and food security.

As part of the ongoing global agenda, the United Nations has set out among other 17 agenda, three (3) specific agenda to achieve sustainable development through Ending poverty in all its forms everywhere-goal-1, Ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture-goal-2 and Ensuring sustainable consumption and production patterns-goal-12. These goals are dependent mostly on the rural farmers in the developing nations such as Nigeria, where majority of the rural population depended on farming and produce over 60% of the foods consumed in the rural communities as well as the urban communities alike. The increase in the herders/farmers conflicts in southeast Nigeria has resulted to untold hardship and challenges both to the farmers and the general public with such indicators as alteration of food production, food availability, food accessibility, and food stability in the region (Oli, Ibekwe & Nwankwo, 2018; Oti, Onyia & Umoinyang, 2017). One notable effect of transhumance-related conflict in Nigeria is the alteration of food security mechanism in southeast Nigeria. Herding and farming businesses are sacrosanct in the survival of the population and economy of the sub-Saharan African nations; this is evidence in the nutritional needs of household of these nations being met by herders and farmers alike. Meeting the dietary needs of the population at the individual, household, national and global scales, which is one of the major agenda of the United Nations is a subject to the physical and economic access to food products from near and far depending on their locations.

Different researchers have explored the issue of transhumance-related conflicts in southeast Nigeria from different dimensions with different results. However, much are yet to be empirically explored on the effect of transhumance-related crises in view of the four dimensions of food security (food production, food availability, food accessibility and food stability) in the region. The recent surge in food insecurity in southeast Nigeria both in the urban and rural areas has been connected to the timeline of herdsmen invasion of southeast geopolitical zone of Nigeria. The farmers are destabilized from their farms in the rural communities by the activities of herdsmen, which has far reaching implications to the overall processes of food insecurity. The regional and interregional transportation networks through which food is moved from one state to another has been entirely disrupted by the herdsmen insecurity activities thereby hampering food accessibility among the population; and, the price of food items in the market has obviously been unstable with price fluctuation due to the scarcity of food items. All these crises, which are connected to food security, have not been specifically investigated with population based survey research. Owing to the need for population-based empirical substantiation of the cause-effect relationship between resource-access crises and food insecurity for sustainable policy intervention and contribution to the on-

going global discuss on food security, the present study has been designed to dig deep into the indicators of reoccurring resource-access crises and the emerging food insecurity in southeast Nigeria. The study investigated the relationship between environmental-related conflicts and the four dimensions of food security. Equally, the study investigated the predicting factors to food insecurity in southeast Nigeria. These were carried out with the aid of survey design and correlation statistics specifying the relationship of the interest variables. The investigated variables in the study showed the strong relationship between the indicators of environmental-related conflicts and the food security indicators as well as climate change social indicators and the food security indicators. Having introduced the study, other sections of the study included research questions, theoretical framework, research methodology, findings of the study, discussion and conclusion.

Research Questions

The study was guided by the following research questions:

RQ1 What is the correlation between transhumance-related crises and the four dimensions of food security in southeast Nigeria?

RQ2 What are the factors affecting rural-urban food circulation management among the rural farmers in southeast Nigeria?

RQ3 What are the predictors of agricultural sustainability among the farmers in southeast Nigeria?

RQ4 What are the implications of transhumance-related resource-access crises in southeast Nigeria to agricultural-associated sustainable development goals?

Theoretical Framework

This study was guided by Resource Access Theory by Ribot and Peluso (2003). The theory was propounded in 2003 as analytical framework and thesis to understand the invisible forces of crises between resource availability and access to such resources. Central to the human existence and survival, is the question of resources and access to the available resources among a given human population. As the nature and nomenclature of resources changes with context and time, access to resources becomes dynamic in view of the obtainable among the population. The theory of access as was propounded by Ribot and Peluso (2003), points to the inalienable circumstances surrounding access to resources in the society among the given population. Basically, according to Ribot and Peluso (Ribot & Peluso, 2003), the composition of access to resources included location and schema of the dimensions and web of benefits of the resources to the interested individual/group, identification of the system of gain, control and maintenance of the flow, and distribution of benefits by the involved actors. It also involves the understanding of the power relations obtainable in the system regarding the available benefits.

Mechanism of access according to Ribot and Peluso includes the right based access and illegal access, which are captured in the knowledge, capital, market, authority, labour, technology, identities and social relations. While the right-based access according to Ribot and Peluso is the right sanctioned by the state and society through laws, norms, conventions and tradition, illegal access is on the contrary, the enjoyment of access not socially sanctioned by the society and the state. In any case, illegal access is operated through coercion and other compelling means other than socially verifiable and acceptable means among the population. According to the access resources framework, access to the available resources can be facilitated by right-based or illegal access, which are dependent on knowledge, authority, technology, labour, market capital, identity and social relations.

When individuals or group have knowledge of the available resources and the benefits thereof, they tend to utilize this knowledge to take upper hand in the setting; this also applies to having technology and capital that exploits opportunities and resources as the possessors of the technology are bound to overtake the handicapped. In identity and social relationship, the available resources are accessed through the

networks of social connections and identifications available to the individuals and groups. The transhumance-related conflicts in southeast Nigeria is anchored on the basic problem of access to natural resources [land], which the farmers and the herdsman are struggling to access and control. While the farmers in the region see themselves as possessing right-based access to the land resources, the herdsman are viewed as strangers operating illegal access to the lands by invading communities with their cows.

The benefits from the land resources observed by the farmers as cultivation and harvesting of food crops as well as by the herders as grazing reserve for their cows, are seen to be accessed through either right-based access or forceful access. However, the problem of herders/farmers' clashes emanates from the forceful access by the herdsman moving in from northern Nigeria. The herdsman who are intruders and accessing the land resources through illegal means do occupy the farmlands with weapons and frequently clash with the farmers who are indigenes and socially and traditionally approved to own land in the region. The herdsman are aided by the advanced technology in weaponry, capital (financial power) and identity connections. The crises thereof result to the interruption of farming activities evidence in food insecurity captured as interrupted food production, food availability, food accessibility, food utilization and food stability, which are affecting the region. Although Resource-Access-Theory captures the conflict dimension of resource struggle especially the developing nations such as in southeast Nigeria, the lapses of the theory in this context can be found in the role played by developmental indices. For instance, the structure of the farmers/herders conflicts is hanging more on the underdeveloped structure of the business of cattle in Nigeria. This also applies to the farmers who lacked modern mechanism for farming making them vulnerable to the herdsman invasion.

Study Methodology

The study was carried out in southeast Nigeria, which lays between latitudes 4°20' and 7°25' North of the Equator and longitudes 6°37' and 8°28' East of the Greenwich Meridian. Southeast Nigeria is home to the Igbo ethnic group that made up about 18% of Nigerian population and is majorly characterized by socioeconomic activities such as clerical duties, commercial activities and mostly commercial and subsistence agriculture among the rural population. Farming in the rural areas is much dependent on the traditional ownership of land such that non indigenous population in the region is highly restricted from owning the land resources. Traditionally in southeast Nigeria, land ownership follows ancestral lineage and in some cases acquisition through buying of land portions from individuals, families or communities.

The population of southeast Nigeria is about 22 million however, in the rural communities where the farmers reside, the farmers are not easily identified save for the cooperative societies, which classify them according to their farming specialization and interests. The study relied on the cooperative societies in the region to develop sampling frame for the study. In southeast Nigeria, there are five administrative states under which there are numerous senatorial zones, local councils and communities. Under these structures, there are cooperative societies that are platforms for the recognitions of the farmers in the region. These cooperative societies are classified according to their farming activities as well as their interests. The cooperative societies are located in the rural communities but are interconnected in terms of membership and community locations.

Among the five administrative states in southeast Nigeria, which included Abia, Anambra, Ebonyi, Enugu and Imo states, the study randomly selected three administrative states, which happened to be Enugu, Ebonyi and Anambra states. Among the three selected states, there are about 128 standard cooperative societies based on the accreditation criteria by the World Bank and other supportive organisations to agricultural programs in Nigeria. According to the classifications, for a cooperative society to be recognised and given grants and other supports, there must be specification of their types and forms of farming and the membership must not be below 36 consistent farmers, who have at least been in the business for about five years. Equally, there must be evidence of activeness among the societies such as monthly meetings,

seasonal farming activities and annual farming programs exclusive to the societies. From the available documentations, there are about 28082 active cooperative society members in the three states that are involved in the study. The above figure determined the sampling frame as well as the sample size for the study. These cooperative societies were chosen as the sampling frame due to the disjointed activities of independent farmers in the rural communities who cannot be easily located for a study of this pedigree.

Multistage clustered sampling technique was applied to select 78 cooperative societies [these comprise approximately 2736 farmers] for sampling. 625 respondents were selected using appropriate sampling techniques suitable for the study and the population involved in the study. The sampling and selections of respondents were coordinated beginning from the state level to that of senatorial, local council and community levels to accommodate the different stages of cooperative societies' existence in their fashions in the area. Equal sampling technique was applied to select 26 cooperative societies from each of the three administrative states involved in the study, while quota sampling technique was adopted to select cooperative societies at the senatorial, local council and community levels. 6 senatorial zones were selected in total for the study (2 senatorial zones from each of the 3 administrative states) while at least, 4 local councils and 4 communities were selected from each of the included senatorial zones. At least, 4 cooperative societies were selected from the included local communities and, at least 8 respondents were selected from each of the included cooperative society for data using equal proportional sampling technique. In total, 625 respondents were selected from 78 cooperative societies, 39 local councils, 6 senatorial zones and 3 administrative states in southeast Nigeria. The study adopted multistage sampling procedure due to the spatial locations of the cooperative societies and the farmers in the region. Multistage sampling technique enabled the study specifically locate the population appropriate for the study.

The instrument of data collection was questionnaire designed in nominal and ordinal scales containing questions eliciting information on socio-demographic details of the farmers and the four dimensions of food security such as food production, food availability, food accessibility and food utilization. The questionnaire instrument contained 30 items in three segmentations; the first segment contained the socio-demographic information of the respondents; the second segment contained the basic information on farming experiences, encounters with the herdsman and other similar challenges among the farmers, while the third segment of the questionnaire contained the indices of the four dimensions of food security designed in line with the FAO (2021) mild, moderate and severe food insecurity scale and Coleman et al. (2012) Household Food Security Survey Module [HFSSM]. The questionnaire was shared among the respondents simultaneously across the cooperative societies involved in the study with face-to-face approach. This was to control the possible bias envisaged in the study. The data were collected with the help of recruited research assistants from the rural communities. The collected data was analysed using SPSS version 23 while descriptive and inferential statistics were deployed to evaluate the relationship of substantive variables to the study. The analysis was carried in three stages such as the descriptive, correlation and modelling of the predicting factors to food insecurity. These were done with the aid of percentage analysis, Pearson Moment Correlation and Linear model.

Findings of the Study and Analysis

Table 1 shows the socio-demographic information of the respondents. According to the table, majority of the respondents are females (50.2%), while 49.8% are males. From the table, majority of the respondents (34.9%) are in the age category of 40-50 years followed by those in the age category of 18-28 years (20%); 15.2% are in the age category of 29-39 years, 15% are in the age category of 62 years and above, while 14.9% are in the age category of 51-61 years. Majority of the respondents are only educated up to the level of primary/secondary school (54.9%), 30% are educated up to the level of Higher National Diploma/degree certification, 10.1% are educated up to the level of National Certificate in Education/Diploma, while only five percent are educated up to the level of Masters degree and above.

Table1. Socio-demographic information of the respondents

	Variable items	N	Percentage
Gender	Male	311	49.8%
	Females	314	50.2%
Age	18-28	125	20.0%
	29-39	95	15.2%
	40-50	218	34.9%
	51-61	93	14.9%
	62and above	94	15.0%
Education	Primary/Secondary	343	54.9%
	National Certificate in Education/Diploma	63	10.1%
	Higher National Diploma/Degree	188	30.1%
	Masters of Science and above	31	5.0%
Religion	Christianity	377	60.3%
	Islam	62	9.9%
	Traditional African Religion	186	29.7%
Types of Farming by the respondents	Cereals	31	5.0%
	Tuber crops	345	55.2%
	Large crops	124	19.8%
	Vegetables	62	9.9%
	Animal husbandry	63	10.1%
Family size	Less than 1-3	62	9.9%
	4-6 in a household	250	40.0%
	7and more in a household	313	50.1%
Total		625	100.0%

Majority of the respondents (60.2%) are Christians, 29.7% are Traditional African Religion adherents, while about nine percent are Muslims. In the classification of the types of farming by the respondents, majority of the respondents (55.2%) specialized in tuber crops farming these included yams, cassava, cocoyam, potatoes, etc., 19.8% specialized in large crop farming, 10.1% are engaged in animal husbandry about nine percent of the respondents are engaged with vegetables farming and about five percent of the respondents are engaged with cereals. Majority of the farmers maintained family size of 7children and above (50.1%), 40% maintained family size of 4-6children, while only 9.9% of the respondents have family size of less than 1-3children.

Table 2 tested the correlation between transhumance-related crises and food security indicators in the region. The indices of the four dimensions of food security according to the FAO and HFSSM were statistically treated to capture the variables separately for correlation test with the variable of transhumance crisis.

Table 2. *Correlation test on Transhumance-related Crises and Food Security Indicators*

	Spearman's rho	Transhumance-related crises
Food productivity	Correlation Coefficient	-.386**
	Sig. (2-tailed)	.000
Food availability	Correlation Coefficient	-.325**
	Sig. (2-tailed)	.000
Food accessibility	Correlation Coefficient	-.376**
	Sig. (2-tailed)	.000
Food stability	Correlation Coefficient	-.389**
	Sig. (2-tailed)	.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the .000 level (2-tailed).

From the table, there is a significant correlation between transhumance-related conflicts and food production in southeast Nigeria and this relationship is in the negative direction (p.000, rho = -.386); the finding showed that transhumance-related crises explained about 14.9% of the problems of food production among the farmers in southeast Nigeria. This means that the more the incidence of transhumance-related crisis, the less the food production among the famers in the region. From the table also, there is a negative correlation between transhumance-related crises and food availability in the region (p.000, rho = -.325). In translation to real time impact, the finding showed that transhumance-related crises were responsible for about 10.6% of the problem of food availability in the region and this further showed that the more the incidence of transhumance-related crisis, the less of food availability in the region. From the table, there is a negative correlation between transhumance-related conflicts and food accessibility in southeast Nigeria (p.000, rho = -.376); this further showed that transhumance-related crises was responsible for about 14.1% problem of food accessibility in southeast Nigeria; this further shows that the more the incidence of transhumance-related crisis, the more difficult access to food in the region. Nevertheless, the table showed that there is a negative correlation between transhumance-related crises and food stability among the rural farmers in southeast Nigeria (p.000, rho = -.389); this is translated in the real time impacts as about 15.1% of food stability issues among the rural farmers being explained by transhumance-related crises in the region. Equally, the finding shows that the more the incidence of transhumance-related crisis, the less the food stability in the region.

Table 3 showed the predictors of rural-urban food circulation in southeast Nigeria among the rural farmers. The included variables in the model were selected based on the major thrust of the study and the factors relevant in the daily activities of the population. The explanatory power of the table is about 62.6%, that is, the table was able to explain about 62.6% of rural urban food circulation issues in southeast Nigeria. Among the included variables, only education and types of farming among the respondents positively predicted rural urban food circulation among the respondents. In any case, the more educated the respondents are, the more likely they are going to encourage rural urban food circulation in southeast Nigeria. Equally, the more varieties of farming types there are among the farmers, the more likely they are going to encourage rural urban food circulation in southeast Nigeria. Nonetheless, other included factors in the model negatively predicted rural-urban food circulation among the rural farmers in southeast Nigeria. By virtue of the position in the model, factors such as open grazing, herdsman encroachment into the farm, farmers/herders clash, climate change indicators as well as desertion of farm because of herdsman attacks negate rural-urban food circulation. In other words, the more the occurrence of these factors, the less likely the rural urban food circulation I southeast Nigeria.

Table 3. Coefficients of Rural-Urban Food Circulation and other Variables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.535	.134		33.777	.000
Respondents' education	.222***	.016	.451	14.132	.000
Types of Farming by the respondents	.273***	.012	.782	22.207	.000
Rate of open grazing by herdsmen in the local communities	-.089***	.011	-.234	-7.998	.000
Frequency of herdsmen encroachment into the farm	-.222***	.013	-.617	-17.268	.000
Frequent farmers/herdsmen clash	-.267***	.016	-.737	-16.657	.000
Climate change indicators	-.210***	.014	-.485	-14.675	.000
Desertion of farm by farmers due to herdsmen attacks	-.410***	.038	-.488	-10.820	.000

a. Dependent Variable: Rural-Urban Food Circulation

(*df* 8), **p*<.05, ** *p*<.01, *** *p*<.000, *R*²=.791 (62.6), *F* (128.587)

Table 4 showed the model predicting agricultural sustainability among the rural farmers in south-east Nigeria. Among the included variables in the model, only education and types of farming among the farmers positively predicted agricultural sustainability among the rural farmers in southeast Nigeria.

Table 4. Coefficients Of Agricultural Sustainability And Other Variables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.808	.122		22.937	.000
Respondents' age	-.066***	.013	-.146	-5.089	.000
Respondents' education	.053**	.017	.091	3.073	.002
Types of Farming by the respondents	.123***	.011	.295	11.098	.000
Open grazing by herdsmen in the local communities	-.059***	.011	-.131	-5.274	.000
Frequent encroachment into the farmland by herdsmen	-.107***	.012	-.250	-8.596	.000
Frequent clash with herdsmen by farmers	-.323***	.011	-.751	-29.290	.000
Climate change indicators	-.180***	.015	-.349	-12.366	.000
Desertion of farmland due to herdsmen attacks	-.254***	.027	-.251	-9.344	.000

a. Dependent Variable: Agricultural Sustainability

(*df* 8), **p*<.05, ** *p*<.01, *** *p*<.000, *R*²=.876 (76.7), *F* (224.752)

Specifically, the more the farmers become educated, the more likely the agricultural sustainability in southeast Nigeria; the more varieties of farming among the farmers in southeast Nigeria, the more likely the agricultural sustainability in the regions. Meanwhile, other included variables showed negative correlation with agricultural sustainability in southeast Nigeria; these variables included age of the respondents, open grazing, encroachment into the farmland by the herdsmen, farmers/herdsmen clash, climate change indicators as well as desertion of farmland because of herdsmen attacks. The rural farmers population is made up of people advanced in age, which by implication, shows that as they advance in age, their ability to participate in agricultural activities continuously reduce. In the cases of open grazing, encroachment, clashes and climate change indicators, they are obviously frustrating agricultural activities in the region.

Discussion of the Findings and Conclusion

Transhumance-related crises between the farmers and herdsmen in southeast Nigeria as observed in this study has appeared as one of the basic threats to food security in the region and perhaps in Nigeria and sub-Saharan Africa as a whole owing to the fact that foods produced in southeast Nigeria travel a long distance within the region. From the study for instance, transhumance-related crises in the region is responsible for about 14.9% of food production challenges in the region (see table2 above). Food production here included going to the farm, planting the farms during the season, maintaining the farm and successfully harvesting the food crops from the farm I due season. However, in the recent times in the southeast Nigeria, these activities have been interrupted in different manners such as farmers deserting their farmlands because of herdsmen/farmers clashes, changing business from farming to other trade in the urban settings, fear of going to the farm, food crops being destroyed outrightly by the herdsmen cows, etc. All these situations are directly connected to the activities of transhumance in the region. This finding corroborates the findings by other scholars (Obaniyi, Kolawole, Ajala, Adeyemo & Oguntade, 2020; Olumba, Olumba & Alimba, 2021; Ahmed & Kuusaana, 2021), that open grazing anywhere in the world contributes to crises among the herders and the farmers and in most cases with the host community. By implication, the challenges to food production in this region are capable of negatively impacting the national GDP, which has over the years depended on agriculture.

From the findings of the study, there is food availability crises in southeast Nigeria and these crises are connected to the ongoing transhumance-related crises in the region. As specified in the study's findings, transhumance-related crises explained about 10.6% of food availability crises in southeast Nigeria (see table2 above). Food availability is another key component of food security; it is the availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports. In specifics, food availability is dependent more on the productivity capacity of the rural farmers in sub-Saharan Africa, where majority of the food crops consumed are produced in the rural areas and the food consumed among the population is more of indigenous foods than imported food products. The Subsaharan African nations are majorly dependent on the food produced in the rural areas as is the case in southeast Nigeria. According to the finding of the study, the transhumance-related crises are gradually creating food availability crises in southeast Nigeria and in extension, to other regions directly or indirectly depending on the food crops from southeast Nigeria. Other studies earlier have pointed to the inalienable negative correlation between transhumance crises and food availability crises in other places raising a concern for cross examination in other regions as the present study has done (Global Agricultural Monitoring, 2022; Global Network Against Food Crises, 2021; Mbih, 2020).

From this study, it has been confirmed that transhumance-related crises has negative impact on food accessibility; this is statistically ascertained as 14.1% of the food accessibility crises in southeast Nigeria being explained by transhumance-related crises in the region (see table2 above). Food accessibility according to the Food and Agricultural Organization (Food and Agricultural Organization, 2019) is the ability of the population to reach out and secure the available food among the population and beyond following the food supply chain among the population. This included among other things, the ability to

buy the available food products in view of their cost implication, securing the quality and quantity of the food needed for daily consumption as well as accessing food crops available in another area but needed in the present area through food supply chain and interstate and regional links. However, the presence of transhumance-related crises in southeast Nigeria has interrupted the food supply chain in the region. Transhumance-related crises in southeast Nigeria over the years has interrupted farm supplies and by implication frustrated the ability of the farmers to reach out to the population in need of food supply across southeast Nigeria region. Transhumance-related crisis according to other studies (Olagbemiro, Ojediran & Oladipupo, 2022) is one of the basic challenges to food accessibility in many developing nations, complicating the issues of food insecurity in these regions.

Food stability, which is another dimension of food security, is the ability to obtain food over time. Obtaining food over time in different parts of the globe is a subject to the food security situation in a given context and time. Food stability indicators point to the regular availability of food crops produced and supplied within the food chain of a particular region as well as other areas it covers given the fact that science and technology have made it possible for the replication of methods and the approaches in producing the needed food crops without a limit. In southeast Nigeria, there are evidences that food stability as a dimension of food security is lacking in the region as transhumance-related crises have interrupted certain food crops and the farmers specializing in them. As a matter of fact, from this study, transhumance-related crises explained about 15.1% of food stability crises in southeast Nigeria (see table2 above).

Rural-urban food circulation is one of the reliable source for urban food security and this is dependent on the rural food security and food supply chain in the developing nations where there is less mechanized agriculture. In southeast Nigeria as part of the larger circle of the sub-Saharan Africa region, the increase in transhumance-related crises has interrupted rural-urban food supply chain. Notwithstanding, there are other factors in connection with the indicators of transhumance-related crises, that have negatively affected rural-urban food circulation. Social indicators of transhumance-related crises such as open grazing, herdsmen encroachment into the farm, farmers/herders clash as well as desertion of farm because of herdsmen attacks were shown to have negatively affected rural-urban food circulation. According to the study by other scholars such as (Ayantunde, Asse, Said & Fall, 2014), rural-urban food supply chain has been the reliable backup for urban food security in southeast Nigeria and this backup has been affected by the enduring climate change crises, which have affected southeast Nigeria in the recent time. Equally, the studies by (Gbamwuanand & Atim, 2022; Adebayo & Oriolan 2016) elsewhere have revealed the inalienable negative impacts of transhumance crises indicators on the rural-urban food chain and food security.

Agricultural sustainability as part of the global sustainability agenda, is hanging on the activities of farmers around the world. In southeast Nigeria, this is found around the rural farmers who are the backbone of food security in this region. The activities and condition of the rural farmers in southeast Nigeria have more impact on the overall analysis of agricultural sustainability. In the present study, there are factors found to be negating agricultural sustainability among the rural farmers. These included age of the respondents, open grazing, encroachment into the farmland by the herdsmen, farmers/herdsmen clash, climate change indicators as well as desertion of farmland because of herdsmen attacks. Age as a socio-economic variable plays a significant role to agricultural sustainability in the rural areas among the developing nations; this is because of the fact that much of farming activities in the developing nations are still dependent on the physical strength of the farmers, which invariably go down with age. Equally, the transhumance-related crises indicators as negative factors to agricultural sustainability are complicated due to the political and socio-cultural connectivity to this factor among the developing nations. With the continuous resource-access crises between the herdsmen and the farmers, agricultural sustainability seems to be endangered in southeast Nigeria due to the fact that such crises have forced many farmers to desert their farmers; others have changed farming business into other businesses in the nearby urban communities. In recent times, the transhumance-related crises in the rural communities in southeast Nigeria have unfortunately forced many farmers to seek for relief in the urban communities resulting on some population

settlement crises the southeast Nigeria urban communities. The chain reaction of the problem included the fact that the same population that are abandoning farm trade in the rural communities are the ones that are increasing the pressure on urban food security in the urban communities.

Conclusion

As part of the 17 sustainable development agenda, the United Nations have set out to end poverty in all its forms everywhere-goal-1, end hunger, achieving food security and improved nutrition, and promoting sustainable agriculture-goal-2 and ensure sustainable consumption and production patterns-goal-12. As was set out to explore in this study, these key points were found to be endangered by the situation obtainable in southeast Nigeria. For instance, transhumance-related crises in southeast Nigeria have sacked many communities and rendered many farmers jobless. Joblessness and instability in business among the rural farmers are in no doubt harbingers of poverty especially, among a population that lacks diversity in skill and alternative to indigenous farming business. Also, the crises and change in activities orchestrated by transhumance activities in the region has significantly affected food security thereby promoting hunger and consumption crises among the rural as well as urban population in the region due to the interruption of food accessibility, productivity, availability and stability in the region. More importantly, agricultural activities in the region has been generally interrupted with more complex implications such as reducing the number of willing members of the population who would want to participate in farming currently and in future. By implication, food security and agricultural sustainability has been altered among the population and required the intervention of the appropriate government and non Governmental agencies to rescue the population of the region from gradual and enduring food insecurity orchestrated by transhumance crisis.

Limitation to the Study and Direction for Further Study

The present study is limited methodologically, geographically and in the area of interest, prompting the need for further study in an expanded manner to accommodate other aspects of the food insecurity crisis, larger region and methodological triangulation. The study suggests further research on environmental resource-access crises, emerging food insecurity and humanitarian crisis in sub-Saharan Africa.

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SU GANYKLOMIS SUSIJUSIOS KRIZĖS IR APRŪPINIMO MAISTU PROBLEMOS PIETRYČIŲ NIGERIJOSJE: DARNAUS VYSTYMOŠI PASEKMĖS

Anotacija. Pastaruoju metu aprūpinimas maistu Afrikoje į pietus nuo Sacharos pradeda keistis dėl kai kurių veiksnių. Pavyzdžiui, su ganyklomis susijusių krizių regione. Nors sezoninis gyvulių perkėlimas į kitą vietovę yra sena besivystančių tautų, ypač Užsachario Afrikoje, praktika, jos santykis su ūkininkavimu ir žemės ūkio tvarumu pamažu keičiasi dėl regione vis dažniau kylančių politiškaai motyvuotų krizių, susijusių su išteklių prieinamumu. Šiame tyrime nagrinėjome su sezoniniu gyvulių pervarymu susijusias priegios prie išteklių krizes ir maisto saugumo valdymą pietryčių Nigerijoje. Tyrimo imtį sudaro 625 regiono kaimo ūkininkai, kurių nuolatinė gyvenamoji vieta yra ūkininkų kooperatinės bendrovės. Tyrimė vadovautasi išteklių prieinamumo teorija ir apklausos tyrimo planu. Renkant duomenis naudotasi klausimyno priemone, o surinktiems duomenims įvertinti taikyta procentinė, koreliacinė ir regresinė statistika. Pagrindinės tyrimo išvados: su sezoniniu gyvulių perkėlimu susiję konfliktai neigiamai koreliavo su keturiais aprūpinimo maistu regione aspektais, tokiais kaip maisto gamyba (p.000, r = -,386), maisto prieinamumas (p.000, r = -,325), maisto prieinamumas (p.000, r = -,376) ir maisto stabilumas (p.000, rho = -,389). Kaimo ir miesto maisto apyvartą prognozuoja atviros ganyklos, piemenų įsibrovimas į ūkį, ūkininkų ir piemenų susirėmimai, klimato kaitos rodikliai (***) p<.000, R²=.791), o žemės ūkio tvarumą prognozuoja respondentų amžius, atviros ganyklos, piemenų įsibrovimas į žemės ūkio paskirties žemę, ūkininkų ir piemenų susirėmimai, klimato kaitos rodikliai, taip pat žemės ūkio paskirties žemės apleidimas dėl piemenų išpuolių (***) p<.000, R²=.876).

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