

Research Article

AGRICULTURAL PRACTICES AND FOOD SECURITY: AN APPRAISAL OF ENVIRONMENTAL AND SOCIAL FACTORS IN ABRAKA REGION DELTA STATE, SOUTHERN NIGERIA

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Abstract

The study dwelt on “Agricultural Practices and Food Security: An Appraisal of Environmental and Social Factors in Abraka Region, Southern Nigeria”. Farming practices and environmental factors were examined, including information on determinants/ characteristic effects of food security in the area. The questionnaire was the main instrument used for data collection; an in-depth literature review on the subject under consideration was also consulted. Two hypotheses were postulated to guide the course of the study. Hypothesis 1 states that “there is no significant relationship between agricultural practices and food security”. The Pearson product-moment correlation (ppmc) statistical tool was used for data analysis. The computed r-value of 3.259 is greater than the r-critical table value of 3.182 at a 0.05 significance level. Therefore, H₀ is rejected, and H₁ is accepted. The standard coefficient beta of (.690) indicates that agriculture has a 69% relationship with food security. This confirms a significant relationship between agriculture and food security. Hypothesis 2 also confirmed a significant effect of environmental factors on food security in the area. An R-value of 0.872 is significant, which implies that environmental and social factors have a 70% contribution to food security using the regression analysis. Possible technical and institutional measures towards mitigation and adaptation to minimize the problem of food insecurity to enhance agricultural productivity in the area have been addressed in this study to ensure that food crises are averted both for the present generation and posterity.

Keywords- Food security, Agricultural practices, Environmental, Social factors, Abraka region

Introduction

From the global perspective to the local domain, the issue of food security has attracted the attention of diverse stakeholders. This is as a result of the importance of food availability, food accessibility, and affordability to the sustenance of the human race. However, in the 21st century, there exist several environmental and social factors that threaten the flow chain of food security and this in turn results in food insecurity, which is inimical to both communal and national development. Ojo and Adebayo (2021) identified natural environmental factors that result in food insecurity as floods, droughts, erosion pests and diseases, destructive winds and storms, adverse effects of flooding through premature harvest, and loss of farmland. The issue of food security and insecurity is further impaired by agricultural practices beyond the natural environmental hazard. Social economic factors such as unwholesome agricultural practices, which include continuous, cropping and improper mixed farming activities are also implicated. Others include the current menace of herdsmen and farmers crisis, insurgences, wars and communal conflicts. Ivar Nasa and Sophia (2023), also posited that agricultural practices will affect changes in the world food chain in meeting the challenge of feeding 10 billion people sustainably by 2050. The problem of food security is further aggravated through environmental modification which has also led to encroachment into farmlands and ecosystem modification and habitat destruction even in reserved green areas. Thus, reducing available farmlands for arable farming, and also creating microclimatic conditions, that lead to soil deterioration.

Environmental and social factors have consistently maintained a typical status on the global perspective about food security, availability and affordability; arising from environmental, and social, issues such as climate changes, with multivariate effects such as flooding, drought, desertification, erosion, soil impoverishment and security matters. Bibri, Krongstie, Kaboli, and Alahi, (2024), pointed out that environmental and social factors have increased in frequency and intensity over the years. FAO: 2019, remarked that a combination of environmental and social issues have led to food insecurity and food scarcity. Edewor (2024) also posited that a bandwagon effect of unavailability of food, non-affordability of food, and inaccessibility are all negative feedbacks from extreme environmental and adverse weather conditions; including social factors all add up to compound the issue of food insecurity, especially in issues emanating from ecological hazards. Edewor (2021) noted that a healthy and sustainable environmental ethics is necessary to combat environmental issues that threaten the existence of mankind on the earth's surface. This is only achievable through well-thought-out environmentally sustainable practices that prevent the environment from reckless damage.

If mitigation and adaptation measures are not advanced both environmental and social factors, including agricultural practices will hinder food security with its attendant negative consequences on the social and economic well-being of the population. Thus, there is an urgent need to research the issue of food security and insecurity, to improve agricultural productivity. Especially as it relates to the immediate environment where the issues of food security and insecurity are being experienced at different scales. Therefore, in line with the reasoning of Carter (2015), stating that the issues of food security in Nigeria are grossly affected by natural

environmental factors and social factors that will exacerbate the problem. FAO (2022) projected that by 2050's global population may reach ten (10) billion persons, and this will impact negatively on food availability, food accessibility, affordability and food utilization. According to U.N.O (United Nations Organization) projection (2019), the challenge of feeding a world population of ten billion by 2050 will demand alteration of our food chains. In a related opinion. Ivar et al (2023) and Mutale et al (2025) avow that there is a need to safeguard the environment from climate extremes that affect food production. It is therefore imperative to consider the interplay between the environmental and social factors for any given region to attain food security since their role in maintaining food security is imperative for the survival of humanity. Edewor: 2024 also advocated the relevance of the soil factor in ameliorating food scarcity. This is imperative for the survival of humanity. Edewor: 2024, also advocated the relevance of the soil factor in ameliorating food scarcity.

Theoretical Framework

The concept of environmental impact assessment is the pivot of this research work. The justification for its application in the study is substantiated by its role as a constant ameliorant of the environment from environmental degradation that results from pollution; erosion, deforestation, flooding, droughts, dissertation et cetera. Environmental modification and general anthropogenic activities that lead to environmental decline; also help to maintain ecological and environmental stability.

As explicitly stated in decree No. 86 of 1992 by FEPA (1998), a federal environmental agency, the promulgation of the EIA decree No. 86 (1992) reserves the mandate to preserve and conserve the environment. It is also vested with the responsibility of biodiversity conservation environmental preservation and protection from abuse and misuse. The EIA Environmental Impact Assessment is essential to this study for the following reasons;

- I. It safeguards the environment from ecological degradation, thereby making the environment to be more productive, in terms of environmental conservation and preservation, promoting higher returns from soil capacity and sustainability.
- II. It helps to regulate the activities of natural resource extractors to avert environmental crises that would arise from meeting needs in a greedy and reckless name.
- III. It also has the potential to safeguard the environment from environmental crises, with a glaring impact on food production, that could arise from anthropogenic and natural environmental hazards, such as rainstorms (destructive winds), soil erosion, oil pollution, gas flaring, flooding, landslides, soil desiccation, and others.

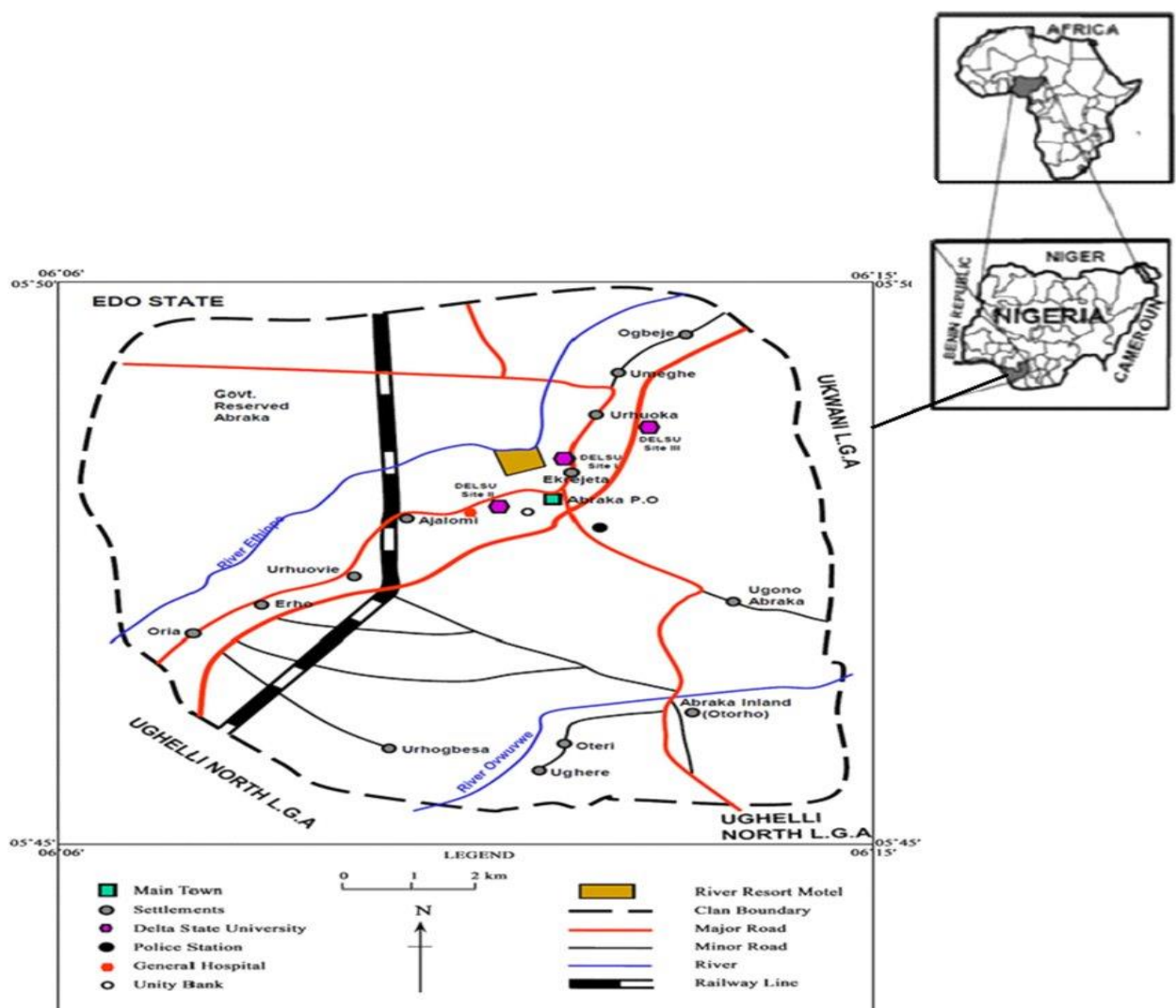


Fig 1. Map of Abraka Region. Source- Author's fieldwork, 2024

A. Location- Abraka region lies approximately on latitude $5^{\circ} 48^1$ and longitude $6^{\circ} 06^1E$. the region is strategically located on the eastern bank of River Ethiope, in the present-day Ethiope East Local Government Area, Delta State, Southern Nigeria, Abraka covers a land area of approximately 212 square kilometres (Akinbode: 2006).

Climate: according to Efe (2024) the climate of Abraka and its environs is influenced by two distinct air masses that define the season of Nigeria. They are (mT) tropical continental air mass and (cT) continental airmass. The Mt is most remarkable almost throughout the year. The mT is the major development of the dry season which usually lasts from March to November. While the cT lasts from mid-October through March annually. The zone of convergence of both air masses is referred to as (ITD) inter-tropical discontinuity. This is usually the threshold of

seasonal variation in climatic conditions experienced in the area. During January, it is dominant in the coastal region of Nigeria and by September, it resides in the Northern extremities of Nigeria. Between the months of July and August, Abraka experiences a brief spell of dryness known as August hiatus, which is commonly referred to as “August break”. The climate of the Abraka region is a major determinant of agricultural productivity and the general economic endeavours of the people, therefore, it has a direct impact on food security and arable farming. Relief drainage and topography of the Abraka region and environs have a degree of perfect drainage system. The region is drained by two main rivers namely (River Ethiope and River Ovwuvwe).

The settlement pattern in the region is characterized by an upland location between the two rivers. The River Ethiope flows in the East-West direction from Umuaja in Ukwuani, where the Ethiope River takes its rise from the foot of a cotton tree. It flows into the Sapele River and empties into the Atlantic Ocean. River Ovwuvwe flows to the south, its catchment is from Utagba-Uno in Ndokwa East both rivers though in a homogeneous region, do not converge at any point, as Ovwuvwe flows parallel to the direction of River Ethiope. The topography of Abraka is a rolling lowland plain above 45m above sea level (Akinbode: 2006).

B. Vegetation- Abraka region is located in the equatorial rainforest vegetation belt. Anthropogenic activities and human interference have reduced the natural forest vegetation to a secondary regrowth. All that is left in terms of vegetation are vestiges of the natural vegetation, due to interference through arable crop farming and indiscriminate lumbering activities. However, some patches of the natural vegetation still occur along the Ethiope River.

C. Human Activities- The main human engagement in the Abraka region is mainly crop farming, cassava is the main staple food crop produced in the area. Others include oil palm fruit collection, palm wine tapping, around the riparian vegetation and other secondary and tertiary activities. The Abraka region has experienced remarkable environmental modification as the region has expanded in leaps and bounds because of its status as a university town, with the increased population of a heterogeneous character. This expansion also results in food insecurity, as cultivable land is being built up, leading to environmental modification and land scarcity.

Materials and Methods

To elicit information on the subject matter of this discourse, the questionnaire method, direct field survey, and oral interviews with the inhabitants of the area were employed. A sample size of 150 respondents (One hundred and fifty was chosen in Abraka rural and Abraka urban based on the knowledge of their farming activities through) a simple random sampling.

The null hypothesis postulated to guide the course of the study states that there is H_0 .

1. There is no significant relationship between agricultural practices and food security.
2. Environmental factors have no significant effect on food security.

For hypothesis I: Pearson product-moment correlation was used PPMC.

Hypothesis Regression Analysis.

Discussion of the results and findings

Table 1: Types of farming / agricultural practices about environmental and social factors affecting food security

S/N	Farm Practices	Very severe	Severe	Moderate	Low	Not affected
a.	Mixed cropping	34(23%)	28(19%)	39(29%)	29(19)	20(13%)
b.	Bush fallowing	40 (27%)	48(32%)	37(25%)	20(13%)	5(3%)
c.	Irrigation practice	59(29%)	42(28%)	26(17%)	13(9%)	10(7%)
d.	Plantation	27(18%)	38(25%)	63(42%)	14(9%)	8(5%)
e.	Nomadic/Pastoral farming	30(20%)	31(21%)	33(22%)	36(24%)	20(13%)
f.	Shifting cultivation	37(25%)	32(21%)	54(36%)	23(15%)	4(3%)
g.	Livestock breeding	59(29%)	42(28%)	26(17%)	13(9%)	10(7%)

Source: Fieldwork, 2024

The import of the above responses is an indication that environmental and social factors affect agricultural practices in the area, which in turn affect food security negatively.

Table 2: Determinants/ characteristic effects of food security in the area

S/N	Items	1	%	2	%	3	%	4	%	5	%
a.	Food crops lost due to excessive heat	52	35	58	39	5	3	18	12	17	11
b.	Food crops lost due to environmental and social factors	29	17	58	39	10	7	35	25	21	14
c.	Food crops lost due to rise in temperature	59	39	33	22	28	19	13	9	20	13
d.	Crops wasted away in farms due to excessive rainfall	29	19	18	12	18	12	54	36	31	21
e.	Premature harvest due to flooding hazard	58	39	33	22	14	19	17	19	28	19
f.	Food produced is unavailable during heavy rainfall	58	39	26	17	21	14	35	25	10	7
g.	Poor crop yield due to flooding hazard	59	39	33	22	28	19	13	9	20	13

Source: Fieldwork, 2024

Key- 1 (very high), 2 (high), 3 (moderate), 4 low), 5 (very low)

Table 2 above shows responses from respondents interviewed in the course of the study, which summarizes some salient determinant factors that induce food security and food scarcity in the area.

Table 3: level of awareness of the people about the following environmental factors as it affects food security

S/N	Awareness	1	%	2	%	3	%	4	%	5	%
a.	Seasonal floods	38	25	42	27	53	35	14	9	5	3
b.	Erosion	24	17	23	16	45	31	50	35	1	1
c.	Pest and diseases	14	9	26	17	63	41	31	20	19	12
d.	Fulani herdsmen and farmers clash	20	14	54	37	47	32	22	15	2	2
e.	Community crisis	63	39	49	30	32	20	15	9	4	2
f.	Bad road	48	29	41	26	44	27	12	8	15	9

Source: Field work, 2024

Key- 1 (very high), 2 (high), 3 (moderate), 4 low), 5 (very low)

Table 3 shows the level of awareness of the people about the following environmental factors and social factors as they affect food security. The table also indicates that farm produce is valuable to environmental and social factors such as pests and diseases, farmer header conflicts and bad roads.

Testing of Hypothesis and Discussion of Results

Hypothesis One- There is no significant relationship between agriculture and food security

Table 4. Pearson Product Moment Correlation (PPMC)

Model	Unstandardized Coefficients		Standardized Coefficients	r	Sig.	95.0% Confidence	
	B	Std Error	Beta			Lower Bound	Upper Bound
(Constant)	155.98	107.39			156	-374.46	62.5
1 Flooding & food	7.065	3.76				-586	
Security in Abraka			0.69	3.53	0.7		14.72

Author’s computation, 2024

Table 4, shows that the computed r-value (3.529) is greater than the r-critical table value (3.182) at a 0.05 significance level. Therefore, H₀ is rejected and H₁ is accepted. The standardized coefficient beta value (.690) shows a significant relationship existing between the variables indicating that agriculture has a 69% relationship with food security. This implies that there is a significant relationship between agriculture and food security. Therefore, to curb the looming

threat of food insecurity, agricultural activities should be intensified. Also, agricultural activities such as continuous cropping, and indiscriminately mixed cropping should be minimized.

Hypothesis Two- Environmental factors and social factors have no significant effect on food security.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Change Statistics				
					R Square Change	F. Change	df 1	df 2	Sig. F
1	0.87	0.763	0.871	0.02356	0.87	45035996273 704952	3	30	0.95

Author's computation, 2024

Table 4 showed that the r-value of 0.872 is significant which implies that environmental factors and social factors have 76% contribution to food security. This is an indication that environmental and social factors affect food security. Therefore mitigation and adaptation measures should be put in place to control the effects of environmental and social factors.

Policy Implications and Recommendations

Food security is central to the survival of humanity. The study therefore recommends the following.

1. Farm products in the area are vulnerable as well as susceptible to a myriad of environmental and social factors that hinder food affordability, food availability and food accessibility. There is therefore a need to explore ameliorative methods to boost food security.
2. There is a need to step up mitigation and adaptation measures to stem the tide of food insecurity in the area, especially with the recent conversion of the Abraka-Ugo forest reserve estate as an industrial construction site in 2022 for oil palm production (Palmo Rubber Estate).

3. There is also the need to boost agricultural productivity through proper soil management practices, introduction of early maturity/ hybridized species is necessary while ensuring general soil conservation measures.

Government policy on farming and agricultural practices should adopt effective soil management and farming/agricultural practices that boost food security, with environmental, protection management and conservation in view, together with intensification of EIA (Environmental Impact Assessment). Smart agriculture is also recommended to make agricultural productivity more attractive to the youth.

4. Soil should be effectively managed for precision agriculture in view.
5. There is a need to provide manpower and security devices at the rudimentary level, as well as Artificial Intelligence devices to track heinous activities of herdsmen in the region to protect life and farm produce.

Conclusion

The main theme of enquiry for the study addressed agricultural practices and food security An appraisal of the Environmental and Social factors in the Abraka Region. The study indicated that environmental and social factors such as rainstorms, flooding, poor soils, soil degradation, premature harvest due to environmental hazards, farmers herdsmen clashes, contribute significantly to food scarcity that leads to food insecurity. Through the hypotheses postulated and tested to guide the study, inferences have been to the effect that a significant relationship exists between agricultural practices and food security in the area. The study also affirmed that an amalgam of environmental and social factors has a significant effect on food security in the study area, within natural environmental hazards. This is already evident in the hike in staple food prices such as garri, yam, palm oil, pepper and other staple food products.

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