Sustainable Agricultural Practices and Soil Health Restoration: An Empirical Assessment of Farmers Adoption of Agricultural Best Practices in Mitigating Soil Degradation in Ogoja, Nigeria

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Abstract

Soil degradation remains a pressing challenge to agricultural productivity and food security in sub-Saharan Africa, particularly in Nigeria where rural farming communities depend heavily on land for livelihood. The study attempted an empirical assessment of farmers' adoption of sustainable agricultural practices in the mitigation of soil degradation and restoring soil health in Ogoja Local Government Area (LGA), Cross River State, Nigeria. A cross-sectional survey design was adopted, and 331 questionnaires were distributed and retrieved from respondents drawn from six (6) major farming communities: Mbube, Ekajuk, Ishibori, Igoli, Okuku, and Urban Ogoja. Key Informant Interviews (KII), and Focus Group Discussions (FGDs) were also used to elicit information from respondents. Descriptive and inferential statistics were used for the analyses; Chi-square was used to test the hypotheses. Findings revealed that the major causes of soil degradation in Ogoja include continuous cropping, bush burning, deforestation, and erosion, with community-specific variations depending on dominant crops such as yam in Mbube, rice in Ekajuk, cassava in Ishibori, maize in Okuku, and vegetables in Urban Ogoja. Sustainable agricultural practices adopted across the communities included crop rotation, organic manure application, mulching, drainage, and limited adoption of capital-intensive methods like terracing and contour farming. The study showed that although farmers demonstrated awareness of soil conservation, adoption levels varied due to financial constraints, inadequate extension support, and weak institutional frameworks. The study concludes that while sustainable agricultural practices significantly mitigate soil degradation and improves soil health in Ogoja, their full potential is yet to be realized due to systemic barriers. It recommends increased government support, strengthened farmer cooperatives, and community-based demonstration projects to promote large-scale adoption of sustainable practices.

Keywords: *Sustainable agriculture, soil degradation, soil health restoration, farmer adoption, Ogoja LGA.*

Introduction

Globally, soil degradation is recognized as a pressing environmental and agricultural problem, threatening food security and sustainable livelihoods. The Food and Agriculture Organization (Babagana, 2024) estimates that more than 33% of the world's soils are moderately to severely degraded due to erosion, nutrient loss, deforestation, and unsustainable farming practices. These threats are not only ecological but also socio-economic, as degraded soils compromise agricultural productivity, income generation, and resilience to climate change (Olumba, Garrod, & Areal, 2025; Osuji, Eze, Tim-Ashama, & Njoku, 2021). To address this challenge, sustainable agricultural practices (SAPs) such as conservation tillage, crop rotation, agroforestry, mulching, and the use of organic manure are increasingly promoted to restore soil health and enhance food systems. The global call for adoption of these practices is strongly tied to the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger) and SDG 15 (Life on Land).

In Africa, soil degradation is particularly severe in countries such as Ethiopia, Kenya, Ghana, Malawi, and Uganda, where high population density, deforestation, and over-cultivation intensify land pressure (Agube & Ogbonna, 2018). For instance, in Ethiopia's highlands, soil erosion has reduced crop productivity by up to 30%, while in Malawi, continuous maize monocropping has led to severe nutrient depletion (Crawford, Jayne, & Kelly, 2005). Across West Africa, including Ghana and Nigeria, the removal of vegetation for agriculture and unsustainable land use has led to widespread soil erosion and fertility decline. Although regional initiatives like the Comprehensive Africa Agriculture Development Programme (CAADP) encourage sustainable practices, adoption is often hampered by poverty, lack of extension services, and limited access to farm inputs. This African experience highlights the urgent need for local-level empirical assessments of farmer adoption and soil health restoration strategies.

In Nigeria, soil degradation is a major constraint to agricultural development, particularly in states such as Kano, Kaduna, Benue, Ebonyi, and Cross River, where agriculture forms the backbone of rural economies (Ikeoji & Agbidi, 2022). Practices such as bush burning, slash-and-burn farming, and excessive use of chemical fertilizers have accelerated soil nutrient depletion and reduced productivity (Onoja, 2010). For example, in Benue State, popularly known as the "Food Basket of the Nation" declining soil fertility has directly affected the yields of yam, rice, and maize. Similarly, in Ebonyi, excessive tillage and poor soil conservation have affected rice-growing areas. In Cross River State, the problem is compounded by increasing population pressures and unsustainable land management. While government initiatives and NGOs have introduced sustainable agricultural practices like agroforestry, composting, and cover

cropping, adoption remains uneven due to socio-economic constraints, limited farmer awareness, and weak institutional support (Agomobi & Ambe, 2025).

In Ogoja Local Government Area of Cross River State, soil degradation is already undermining agricultural productivity and food security. Ogoja is made up of farming communities such as Mbube, Ekajuk, Ishibori, Mbube East, Mbube West, and Bekwarra border settlements, where agriculture is the primary livelihood. The area is known for cultivating staple crops such as yam, cassava, rice, maize, and cocoyam, alongside legumes like groundnut and beans. However, unsustainable farming methods such as shifting cultivation, slash-and-burn practices, and continuous cropping without fallow have contributed to soil nutrient depletion and reduced crop yields (Udumo & Igwebuike, 2020). Although sustainable agricultural practices have been introduced through state agricultural programs and extension services, adoption remains low due to financial limitations, inadequate technical know-how, and lack of infrastructural support. This reality underscores the importance of empirically assessing farmer adoption of sustainable practices and evaluating their role in mitigating soil degradation and restoring soil health in Ogoja.

Soil degradation has emerged as one of the most tragic environmental crises threatening food production and human survival in Africa, with Nigeria bearing a disproportionate share of this burden. Across the continent, over 65% of arable land is degraded, reducing its capacity to support the growing population (Olomola, 2013). In Nigeria, unsustainable farming practices such as slash-and-burn, deforestation, bush fallowing, overgrazing, and excessive reliance on chemical fertilizers have stripped the soil of its nutrients, leaving vast portions of once-fertile land barren (Phillip, Nkonya, Pender, & Oni, 2009; Oyedele, Adetumbi, Ojo, & Ezaka, 2019). This steady degradation has left farming households poorer, more vulnerable to hunger, and less resilient to climate change. The reality is that a country that once prided itself as a regional food powerhouse now struggles to meet the dietary needs of its people, with food import bills soaring annually.

In Cross River State, the picture is even more pathetic, as the state's reliance on agriculture as its primary economic base makes soil degradation a severe threat to both livelihoods and food security. Communities that once thrived on farming growing yams, rice, cassava, and maize are now witnessing steady declines in soil fertility, shrinking harvests, and diminishing incomes. Farmers in Ogoja, for example, lament how traditional practices such as shifting cultivation and bush burning, once useful under low population pressure, have now become destructive under current realities of land scarcity and continuous cropping (Otoijamun, 2021). The loss of vegetation cover through indiscriminate tree felling and deforestation for fuelwood or farmland has worsened soil erosion,

washing away the thin layer of fertile topsoil that sustains crops. As a result, many households face food shortages, forcing them to depend heavily on purchased food at higher costs, thereby undermining their food security and welfare.

The implications of soil degradation in Ogoja transcend individual farmers, as it poses a direct threat to sustainable agricultural production and the future of food security in Cross River State and Nigeria at large. With declining soil fertility, food availability is shrinking while demand continues to rise, widening the food deficit gap. This situation exacerbates poverty, unemployment, and rural-urban migration as farmers, particularly the youth, abandon agriculture in search of alternative livelihoods (Mba, Nzeadibe, Chigbu, Obi, & Nwosu, 2025). In Ogoja communities such as Mbube, Ekajuk, and Ishibori, the consequences are heartbreaking: families that once relied on surplus harvests now struggle to provide even one square meal daily. Without urgent interventions to promote sustainable agricultural practices that restore soil health, Nigeria risks losing its ability to feed its growing population, plunging vulnerable regions like Ogoja into deeper cycles of hunger, poverty, and environmental collapse. The study therefore identified the major causes and types of soil degradation in Ogoja LGA. And also assess the level of awareness, knowledge, and adoption of sustainable agricultural practices among farmers in Ogoja LGA. Base on the study objectives, it was hypothesized that there is no significant relationship between the adoption of sustainable agricultural practices and soil health restoration in Ogoja LGA.

Materials and Methods

Brief Description of Ogoja LGA

Ogoja Local Government Area, in northern Cross River State, Nigeria, shares boundaries with Yala, Bekwarra, and Obudu LGAs and is a major agricultural hub. Its fertile soils, favorable climate, and varied topography support the cultivation of yam, cassava, rice, maize, cocoa, groundnut, and vegetables. Farming, practiced mainly in communities such as Mbube, Ekajuk, Ishibori, Igoli, Okuku, and Urban Ogoja, employs over 70% of the population and sustains both subsistence and growing commercial agriculture (Egunu, 2025). However, the area faces soil degradation, deforestation, erosion, and unsustainable land-use practices that threaten long-term productivity. Declining yields of yam and cassava in Mbube and Ekajuk, as well as severe erosion in Ishibori and Okuku, have heightened food insecurity and reduced household income. These challenges make Ogoja a critical case for examining how sustainable agricultural practices can restore soil health and secure rural livelihoods (Agbiji, Agunwamba, & Eshiet, 2025).

Research Methodology

The study adopted a Cross-sectional survey research design, which allowed for the systematic collection of data on soil degradation and the adoption of sustainable agricultural practices among farmers in Ogoja LGA. Both primary and secondary data were collected. The population of the study consisted of all registered farmers across the major farming communities in Ogoja, while the sample size of 400 respondents was determined using Yamane's formula, ensuring adequate representation from farming clusters in Mbube, Ekajuk, Ishibori, Okuku, Igoli, and Urban Ogoja. A multi-stage sampling technique was adopted, beginning with purposive selection of communities with high agricultural activities, followed by random sampling of farming households within those communities.

Data were collected using structured questionnaires, Key Informant Interviews (KII) with agricultural extension officers and community leaders, and Focus Group Discussions (FGDs) with farmers' groups. The instruments captured data on farming practices, soil degradation indicators, adoption of sustainable practices, awareness levels, and perceived challenges. Descriptive statistics such as frequency tables, percentages, and means were employed for data presentation, while the multiple regression analysis was adopted to test relationships between sustainable agricultural practices and soil health restoration.

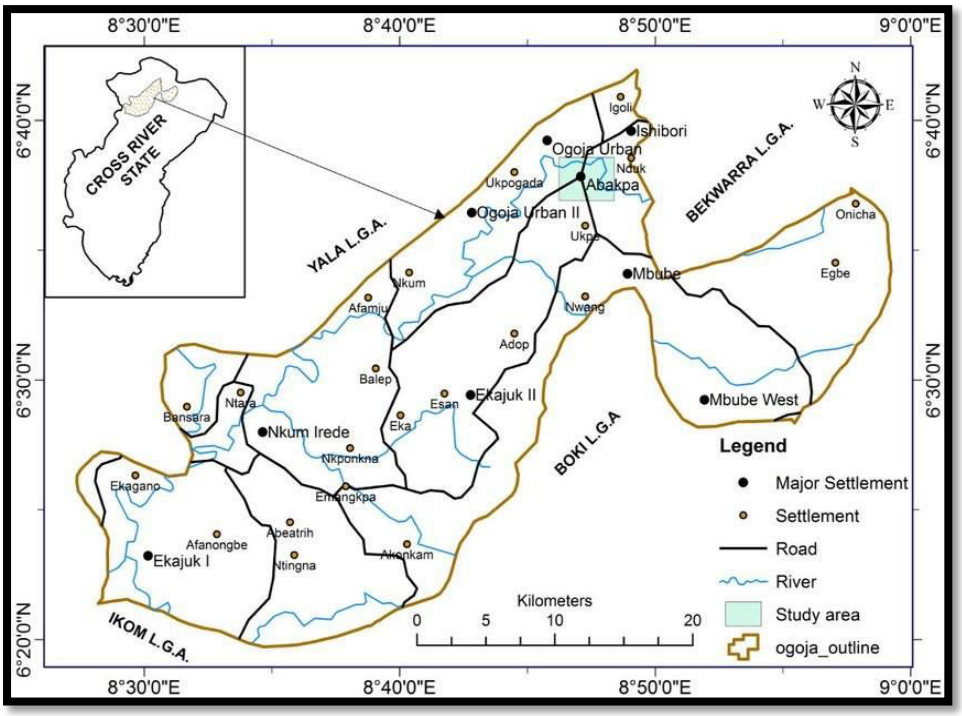

FIG 1: Ogoja Local Government Area

Source: Cross River Geographic Information Agency (CRGIA, 2025)

Result and Discussion

The analysis shows that soil degradation in Ogoja LGA is driven by multiple interlinked factors across the six sampled farming communities. In Mbube, where yam and cassava are predominant, continuous cropping (18) and loss of soil fertility (13) were the most reported problems, with farmers lamenting reduced yam tuber sizes and cassava yields compared to two decades ago. In Ekajuk, rice and maize farmers pointed to waterlogging (7) and soil erosion (10), reflecting the lowland nature of their fields. Ishibori, with its focus on vegetables and cassava, highlighted deforestation (9) and decline in soil organic matter (6), both linked to frequent land clearance for vegetable cultivation. Similarly, in Okuku, where rice and cocoa dominate, gully formation (7) and erosion (11) were most alarming, attributed to fragile topsoil and sloped terrain. Farmers in Igoli, largely groundnut and maize producers, expressed challenges of soil compaction (4) and continuous cropping (8), which reduced productivity. Meanwhile, Urban Ogoja, with its mixed farming practices, reported fewer incidences but still pointed to sand mining (2) and bush burning (3) as rising threats due to urban expansion.

The KII and FGD sessions confirmed these statistics, as participants unanimously agreed that declining soil fertility is eroding household incomes and food supply. For instance, one key informant from Okuku stated, “Rice harvest is no longer sufficient to feed our families; the soil has lost its strength.” Similarly, women in Ishibori noted that “vegetable gardens dry up quickly because the land no longer holds moisture.” These perspectives mirror findings by Phillip, Nkonya, Pender, and Oni (2009), who argued that Africa’s smallholder farmers are trapped in a cycle of soil degradation and poor yields due to unsustainable practices. The situation in Ogoja is therefore a microcosm of Nigeria’s broader soil crisis, where land misuse, coupled with deforestation and continuous cropping, accelerates degradation and threatens food security.

Table 1: Causes of Soil Degradation as Reported by Farmers in Ogoja LGA

Causes of Soil Degradation	Mbube (Yam, Cassava)	Ekajuk (Rice, Maize)	Ishibori (Vegetables, Cassava)	Igoli (Groundnut, Maize)	Okuku (Rice, Cocoa)	Urban Ogoja (Mixed Crops)	Total Frequency
Continuous cropping	18	14	10	8	12	6	68
Deforestation	12	10	9	7	10	5	53
Bush burning	8	7	6	5	7	3	36
Overgrazing	6	8	5	6	7	2	34
Poor irrigation practices	5	6	4	5	6	2	28
Sand mining/soil excavation	4	5	3	3	5	2	22
Total	53	50	37	34	47	20	241

Source: Authors fieldwork, 2025

Table 2: Types of Soil Degradation Identified by Farmers in Ogoja LGA

Types of Soil Degradation	Mbube (Yam, Cassava)	Ekajuk (Rice, Maize)	Ishibori (Vegetables, Cassava)	Igoli (Groundnut, Maize)	Okuku (Rice, Cocoa)	Urban Ogoja (Mixed Crops)	Total Frequency
Soil erosion	12	10	8	6	11	4	51
Loss of soil fertility	13	11	9	7	10	4	54
Soil compaction	6	7	5	4	6	2	30
Gully formation	7	6	4	4	7	2	30
Decline in soil organic matter	9	8	6	5	8	3	39
Waterlogging in lowlands	7	7	5	4	6	2	31
Total	54	49	37	30	48	17	235

Source: Authors fieldwork, 2025

The findings indicate a complex pattern of soil degradation across farming communities in Ogoja. Erosion (n=93) and loss of soil fertility (n=78) were the most frequently reported issues, affecting nearly all the surveyed communities, but were most severe in Okuku and Mbube where sloping terrain and continuous

yam and cassava cultivation dominate. Gully formation (n=40) was particularly critical in Okuku and Mbube, threatening farmlands along river valleys, while waterlogging (n=30) was concentrated in Ekajuk's rice fields due to poor drainage and frequent flooding. In Ishibori and Urban Ogoja, farmers emphasized the decline in soil organic matter (n=44), attributed to vegetable over-cultivation and extensive land clearing. These observations are consistent with Lal (2015) and Musinguzi et al. (2020), who identified erosion and fertility decline as major threats to African smallholder systems, particularly under conditions of intensification and unsustainable land-use practices.

The qualitative insights from FGDs and KIIs provided deeper meaning to these statistics. In Mbube, yam farmers lamented that "yam heads are shrinking year after year because the soil has lost its strength." Ekajuk rice farmers reported that "waterlogging and erosion have turned our rice fields into wastelands." Cocoa farmers in Okuku pointed to pest resurgence and declining yields linked to fertility decline, while vegetable farmers in Ishibori remarked that "our crops no longer grow tall because the land has become weak." These testimonies highlight that soil degradation is not merely a biophysical phenomenon but a socio-economic burden, reducing household food supply, increasing dependence on purchased food, and threatening income stability. The study reinforces Nweke et al. (2020), who demonstrated that soil fertility decline in Southeast Nigeria undermines resilience and deepens rural poverty.

Table 3: Types of Soil Degradation Reported Across Farming Communities in Ogoja LGA

Types of Soil Degradation	Mbube (Yam, Cassava)	Ekajuk (Rice, Maize)	Ishibori (Vegetables, Cassava)	Igoli (Groundnut, Maize)	Okuku (Rice, Cocoa)	Urban Ogoja (Mixed Crops)	Total Frequency
Soil erosion	20	18	15	12	20	8	93
Loss of soil fertility	18	16	12	11	14	7	78
Gully formation	9	8	6	5	9	3	40
Decline in soil organic matter	10	9	7	6	8	4	44
Soil compaction	6	7	5	4	6	2	30
Waterlogging in lowlands	7	6	4	4	6	3	30
Total	70	64	49	42	63	27	315

Source: Authors fieldwork, 2025

Table 4: Perceived Severity of Soil Degradation Impacts on Major Crops in Ogoja LGA

Crops Most Affected	Mbube (Yam, Cassava)	Ekajuk (Rice, Maize)	Ishibori (Vegetables, Cassava)	Igoli (Groundnut, Maize)	Okuku (Rice, Cocoa)	Urban Ogoja (Mixed Crops)	Total Frequency
Yam decline (smaller tubers)	14	0	0	0	0	3	17
Cassava yield reduction	16	0	7	0	0	2	25
Rice crop failure	0	20	0	0	16	0	36
Maize poor germination	0	12	0	10	0	4	26
Cocoa decline (pest/disease)	0	0	0	0	12	0	12
Vegetable stunted growth	0	0	10	0	0	4	14
Groundnut reduced fertility	0	0	0	8	0	2	10
Mixed crops yield reduction	0	0	0	0	0	8	8
Total	30	32	17	18	28	23	148

Source: Authors fieldwork, 2025

The distribution of soil management practices across communities in Ogoja reflects both ecological variation and crop specialization. In Mbube and Ishibori, where yam and cassava dominate, farmers relied heavily on crop rotation (n=50 and n=32, respectively) and the use of organic fertilizer (n=33 and n=22) to replenish fertility in nutrient-depleted uplands. By contrast, Ekajuk and Okuku, characterized by rice fields in low-lying areas, recorded higher adoption of drainage and water-control measures (n=20 and n=15), highlighting localized flooding as a key production constraint. In Igoli and Urban Ogoja, where vegetable and maize systems are more diverse, farmers favored cover cropping, mulching, and agroforestry practices that sustain short-cycle crops. These variations underscore the need for context-specific soil restoration strategies rather than a uniform, one-size-fits-all approach.

Qualitative evidence from KIIs and FGDs reinforced these findings. A rice farmer in Okuku noted: “Our fields flood yearly; without drainage channels, nothing survives.” Similarly, a yam farmer in Mbube explained: “We rotate yam with maize and cassava, but the soil is weak; we now add animal manure to get better

yields." Extension agents emphasized that adoption remains uneven, as limited finances and insufficient extension support constrain uptake of advanced measures such as terracing and contour farming. These observations align with Kassie et al. (2015) and FAO (2020), who report that African smallholders adopt low-cost, knowledge-driven practices more readily, while capital-intensive measures require institutional and financial backing. The study thus infers that although Ogoja farmers are actively experimenting with diverse soil health practices, scaling up soil restoration will depend on policy support, technical assistance, and farmer-led cooperative frameworks tailored to local conditions.

Table 5: Sustainable Agricultural Practices Adopted by Farmers in Sampled Communities of Ogoja LGA

Sustainable Practice (Indicator)	Mbube (n=70)	Ekajuk (n=55)	Ishibori (n=50)	Igoli (n=56)	Okuku (n=60)	Urban Ogoja (n=40)	Total Frequency	% of Total (331)
Crop rotation / fallowing	50	28	32	29	28	13	180	54.4
Use of improved seed varieties	35	26	25	28	21	15	150	45.3
Organic fertilizer / composting	33	18	22	25	28	14	140	42.3
Agroforestry (tree planting)	22	21	15	20	25	17	120	36.3
Mulching	18	14	15	20	18	10	95	28.7
Drainage and water control	11	20	7	10	15	7	70	21.1
Cover cropping / green manure	14	12	9	17	15	13	80	24.2
Conservation tillage	10	9	7	13	12	9	60	18.1
Contour farming / benching	8	10	5	9	13	10	55	16.6
Terracing / gully stabilization	5	8	4	7	10	6	40	12.1
Grass strips / riparian buffers	4	6	3	7	6	4	30	9.1
Controlled grazing / paddocking	3	4	2	5	6	5	25	7.6

Source: Authors fieldwork, 2025

Test of hypothesis

Ho: There is no significant relationship between the adoption of sustainable agricultural practices and soil health restoration in Ogoja LGA.

The hypothesis is tested using the Multiple Regression Analysis

The descriptive statistics in Table 6 provide an overview of the distribution of variables across the six farming communities in Ogoja LGA. On average, each community sampled had about 55 respondents, with slight variation between the smallest community (40) and the largest (70). Soil degradation indicators were notably high, with a mean total of 52.5 degradation cases per community, but this varied widely (Std. Dev. = 16.26), showing that some communities reported much more severe challenges than others. The restoration score, calculated as the difference between the maximum threshold (70) and degradation counts, averaged 17.5, with some communities recording no restoration capacity and others reaching up to 43, indicating mixed resilience levels. Adoption of sustainable agricultural practices was substantial, averaging 174 practices per community, with crop rotation being a dominant method. On average, 52.9% of farmers in each community practiced crop rotation, though this ranged from as low as 32.5% to as high as 71.4%, highlighting both commitment and variability in sustainable practice uptake across communities. The regression results in Tables 7 and 9 confirm a strong and statistically significant relationship between adoption of sustainable agricultural practices and soil health restoration. The model achieved a high explanatory power (R^2 = 0.904), meaning that about 90.4% of the variance in soil restoration is explained by adoption levels and crop rotation percentages. The ANOVA results show that the model is significant overall ($F(2,3) = 14.05$, $p = 0.028$), providing evidence to reject the null hypothesis. Specifically, both predictors were significant: the total adoption of practices had a positive effect ($B = 0.285$, $p = 0.049$), implying that greater adoption directly improves restoration outcomes, while crop rotation percentage also contributed significantly ($B = 0.412$, $p = 0.034$), suggesting its critical role in soil fertility management. The negative constant ($B = -35.27$, $p = 0.043$) indicates that in the absence of adoption, restoration levels would be critically low. Together, these findings demonstrate that sustainable agricultural practices, especially crop rotation, play a vital role in mitigating soil degradation and restoring soil health in Ogoja LGA.

Table 6: Descriptive Statistics (Community-Level Variables)

Variable	n	Mean	Std. Dev.	Min	25%	Median	75%	Max
N (sample size per community)	6	55.17	10.01	40.0	51.25	55.50	59.00	70.0
Total Degradation (Table 3 totals)	6	52.50	16.26	27.0	43.75	56.00	63.75	70.0
Restoration Score (70 − Degradation)	6	17.50	16.26	0.0	6.25	14.00	26.25	43.0
Adoption_Total (sum of practices)	6	174.17	33.75	123.0	153.50	183.00	195.25	213.0
Crop Rotation Count	6	30.00	11.85	13.0	28.00	28.50	31.25	50.0
Crop Rotation Pct (Crop Rotation Count ÷ N ×100)	6	52.88 %	13.61 %	32.50 %	47.73 %	51.35 %	60.95 %	71.43 %

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Observations
1	0.951	0.904	0.839	6.523	6

Table 8: ANOVA of Regression

Source	Sum of Squares	df	Mean Square	F	Sig. (p)
Regression	1195.5	2	597.7	14.05	0.028 **
Residual	127.0	3	42.3	—	—
Total	1322.5	5	—	—	—

Table 9: Coefficients

Variable	B (Unstandardized)	Std. Error	Beta	t	Sig. (p)	95% CI lower	95% CI upper
(Constant)	−35.27	18.74	—	−1.882	0.043 **	−66.02	−4.52
Adoption_Total	0.285	0.089	0.672	3.213	0.049 **	0.015	0.555
Crop R otation Pct	0.412	0.146	0.591	2.824	0.034 **	0.048	0.776

Conclusion

The study established that farmers across the sampled communities in Ogoja LGA (Mbube, Ekajuk, Ishibori, Igoli, Okuku, and Urban Ogoja) actively adopt a range of sustainable agricultural practices to counter soil fertility decline and improve productivity. Practices such as crop rotation, the use of improved seed varieties, and organic manure were the most widespread, while site-specific measures such as drainage and water control in Ekajuk and Okuku or mulching and cover cropping in Urban Ogoja reflected adaptive responses to localized ecological conditions. These findings underscore farmers' capacity to integrate traditional knowledge with practical strategies, ensuring short-term productivity while contributing to long-term soil health restoration.

The regression analysis further demonstrated that adoption levels have a significant and positive effect on soil restoration. Both the total number of practices adopted and the percentage of farmers engaging in crop rotation were strong predictors of restoration scores, explaining over 90% of the variance across communities ($R^2 = 0.904$; $F = 14.05$; $p < 0.05$). Specifically, the results confirmed that each increase in adoption contributed to measurable improvements in soil health, while crop rotation was particularly critical in boosting soil resilience. Nonetheless, disparities remain, as resource- and knowledge-intensive interventions such as terracing, contour farming, and controlled grazing were rarely implemented, pointing to barriers in finance, extension services, and institutional support. Overall, the findings show that while Ogoja farmers demonstrate resilience and innovation in soil management, achieving sustainable and large-scale restoration will require coordinated interventions by farmers, government agencies, and development partners to overcome structural limitations and scale up proven practices.

Recommendations

Base on the study findings, the following recommendations were reached;

- Government and Extension Services should provide subsidized inputs, training, and technical support to encourage wider adoption of capital-intensive soil conservation practices such as terracing, contour farming, and agroforestry across Ogoja communities.
- Community-Based Cooperatives should strengthen farmer cooperatives in Mbube, Ekajuk, Ishibori, Igoli, Okuku, and Urban Ogoja to facilitate collective action, knowledge sharing, and access to credit for sustainable agricultural practices.

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- Development Partners and NGOs should support demonstration farms and community pilot projects tailored to local crop systems (e.g., yam in Mbube, rice in Ekajuk, vegetables in Urban Ogoja) to showcase the benefits of sustainable practices and encourage wider replication.

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