International Journal of Agriculture and Earth Science (IJAES) E-ISSN 2489-0081 P-ISSN 2695-1894
Vol 10. No. 7 2024 www.iiardjournals.org

Anthropogenic Activities, Soil Quality and Crop Production in Ukwa East Area of Abia State, Nigeria

Ukpere, Dennis Tobins (PhD) And Jaja Bertha Ibinye (PhD)
Department Of Geography and Environmental Studies,
Faculty Of Social Sciences
Ignatius Ajuru University of Education
Rumuolumeni, P.M.B 5047, Port Harcourt
Corresponding Author: dennis4jesusxt@gmail.com
DOI: 10.56201/ijaes.v10.no7.2024.pg144.155

Abstract
The study examined the impacts of anthropogenic activities on soil quality and crop production in Ukwa-East Area of Abia State. It used field surveys and experiments and relied mostly on primary data generated through laboratory analysis of soil samples and 447 copies of questionnaire retrieved from 447 randomly selected farmers. The soil samples were collected at depths of 0-40cm from both cultivated and non-cultivated lands. Four research questions, four specific objectives and one hypothesis guided the study. Descriptive statistics was applied for the research questions while the hypothesis was tested using two- sample t-test at 0.05 significant levels. The main finding are: anthropogenic activities (timber harvesting, fuel wood collection, continuous cultivation) is causing changes (decline) in soil quality; and this is affecting crop production in the area. Ten communities were identified as the most prone to deforestation, intensive farming and soil erosion: (Akwete, Obunku, Ohambele, Umuogor, Abaki, Azumini, Akirika, Obohia, Mkporobe and Obanku). There is significant difference in soil macro-nutrients (NPK), moisture, TOC and TOM between the control site (nor-cultivated land) and experimental sites. Control sites: (sand 65.50%, silt 12.55%, clay 22.95%, N 42.34mg/kg, P 11.79 mg/kg, K 7.75 mg/kg, TOM 26.67, pH 5.6, TOC 34.21%, Temp 26.06^{o}C, moisture 12.03%). Experimental sites mean values: (sand 76.98%, silt 13.38%, clay 8.28%, N 0.10 mg/kg, P 0.10 mg/kg, K 3.6 mg/kg, TOM 7.0, pH 4.6, TOC 5.96%, Temp 26.3^{o}C, moisture 3.4%). The paper therefore recommended for well-coordinated enlightenment campaigns for the use of organic fertilizer and discouragement of acts of deforestation.

Keywords: *Anthropogenic activities, soil quality/nutrients, crop production, Ukwa East*

1 INTRODUCTION

Anthropogenic activities are the real agents of change in our environments. Man's impact on the physical environment is enormous and these include increase in population-land use pressure on available resources, land degradation and soil nutrient loss, burning of fossil fuels, and deforestation. Change like these have triggered climate change, soil erosion, poor air quality, and pollution of drinking water sources. These negative impacts can affect human behaviour and can prompt mass migrations and conflicts over land between farmers and herdsmen. Human-induced

alternations in landuse land cover affect the radiation balance of the earth and therefore contribute to climate change (Agyei, 2009). Thus, various uses of land by man for economic purposes have greatly transformed land cover at a global scale. Over the last 10,000 years, almost half of the earth surface have changed and most of these modification is due to continuous use of land by man especially, farming and timber lumbering or wood harvesting. (Lambin et al., 2013).

Anthropogenic activities are dynamic and universal process which often leads to urban growth and development as well as increase in population and economic activities. Nevertheless, these activities also result to the depletion of forests and decline in soil quality. Anthropogenic activities have caused the deterioration of around a billion hectares of land worldwide. Due to this, numerous ecosystem services are declining globally endangering livelihoods and creating socioeconomic instability arising from conflicts between farmers-herdsmen. The expansion of towns and cities is a result of an increase in landuse activities (residential, commercial, agricultural, institutional, recreational, public, and semi-public places). Ukwa East is part of Abia State, where this phenomena is dominant.

At present, the world population is growing at very alarming rate whilst attempts at food production has not been commensurate with global population explosion. This rapid rise in human population, threatens the production and availability of safe and nutritious food support which is a common feature among developing nations. The challenge of failing soil fertility, degradation, insufficient use of proper fertilizers and scanty soil characterizations, have major effects in lowering crop productivity. It is pertinent to state here that in order to ensure efficient soil quality that is adequate and suitable for crop productivity, it is important to evaluate the fertility status of the soil meant for crop cultivation and this is a vital tool in deciding the type and amount of fertilizer to be supplemented.

In Nigeria, evidence indicates a deteriorating human-land interface in which changes in landscape quality keeps lowering both the productivity of the soil and aesthetic value of the natural environment, with serious effects on the economy due to soil pollution and soil erosion arising from deforestation and continuous cultivation (Randolf, 2017; USDA, 2016; WRM, 2010). The use of certain substances such as pesticides, solvent, halogenated compounds, petroleum hydrocarbons, affects the natural environment by polluting the soil and aquatic environment with pollutants.

Vitousek (2002) argued that the use of traditional approaches like physical and chemical methods for remediation of organic pollutants is economically challenging. Again, burning of fossil fuel, fertilizer production and waste water disposal on land triggered soil pollution. This have nearly doubled nitrogen input into the global circle. Over utilization of farm lands through various activities such as overgrazing, inappropriate clearing techniques and lack of sustainable land use practices have resulted in severe soil nutrients decline and decrease in crop productivity (Isric 2007).

Ukpere (2019) in his paper on urbanization and environmental management crises in Africa, using survey research design, argued that urbanization in Africa is characterized with growing social and environmental challenges/crises such as poor soil fertility, shortage of farm lands, rise in urban population and unemployment, high cost of living and increase in crime rate, housing inadequacies

and emergence of slums and squatter settlement within and around the cities, rise in pressures on natural resources utilization and available infrastructures; increase in industrial related activities and rising cases of pollution of urban airspace, land (soil) and drinking water sources.
This current study seeks to examine the impacts of man's activities on soil quality and decline in crop production in Ukwa East area of Abia state-Nigeria. It therefore addressed the following basic questions:

i) What are the various on-going anthropogenic activities within the geographic space of the area?
ii) What are the communities that are more prone to anthropogenic activities in the area?
iii) Do the identified anthropogenic activities (e.g continuous cultivation, settlement expansion and activities) cause loss in soil quality (nutrient) in the area; and in what way (s)?
iv) To what extent does decline in soil quality affects crop production?

Aim and objectives

The aim of this paper was to examine the impacts of anthropogenic activities on soil quality as it may affect crop production in Ukwa East Area of Abia State. Specific objectives include, to:

i) Identify the various anthropogenic activities going on in the geographical space of the area.
ii) Determine the parts of the local government area that are more prone to anthropogenic activities.
iii) Examine the perceived effects as well as the exact ways (means) through which the identified anthropogenic activities (farming, timber lumbering, settlement expansion, road construction, commercial activities, etc) impacts on soil quality (nutrient) in the area.
iv) Ascertain if decline in soil quality affects crop production in the area.

Research Hypothesis

The following hypothesis was postulated for testing:
H_1: There is significance difference in soil macronutrients between cultivated and non-cultivated lands in the area.

Study Area

Ukwa East Local Government Area is located in Abia State, in Abia South Senatorial District in Nigeria's South East geopolitical zone. It is located between latitudes 5^0 18′ 45″ and 7^0 05′57″ N, and longitudes $7^0$38′45″ and $7^0$57′41″ E (see figure p.1). It is approximately 280sq.km in size. It shares boundaries with the following local government areas: Ugwunabo in the South; Ukwa West in the West; East by Obingwa and Akwa Ibom State by the North.

Its climate is tropical sub-humid. The soils are composed of lateritic clay, coarse aggregates of different sizes and a mixture of silt and loamy soil. The soil in the area is geologically underlain mostly by sedimentary deposits especially towards its west, south and earthen part and igneous in other area. In terms of vegetation Ukwa East falls within the tropical rainforest belt though, the

forest is fast disappearing arising from excessive harvest of timber and final words for domestic usage. According to the NPC (2006), the population of the area grew from 31, 961 in 1991 to 58, 139 in 2006. The people of Ukwa East are mostly peasant farmers and petty traders. Other economic activities apart from secondary services include transportation and forestry related activities.

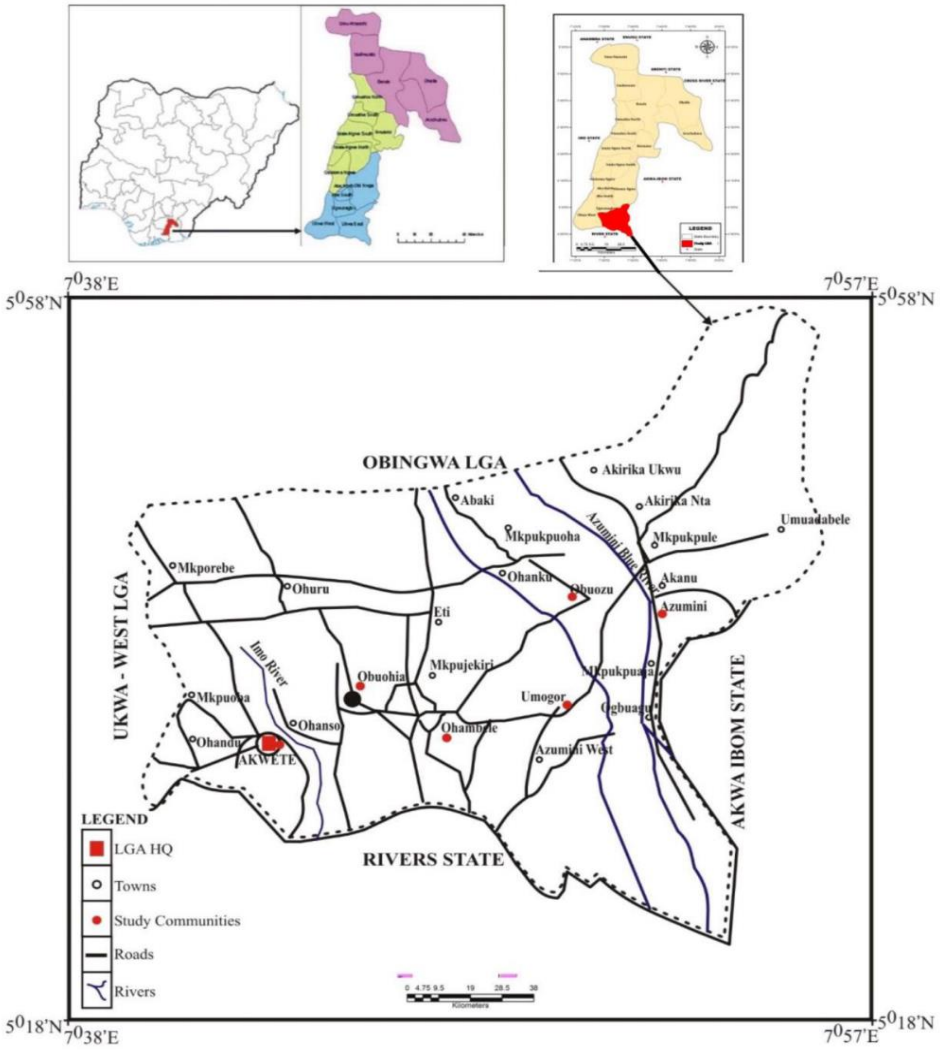

Figure 1.1: The Study Area: Ukwa East L. G. A showing the communities

Source: Digitized from the original map Ministry of Lands, Umuhia

2. LITERATURE REVIEW

Conceptual Clarification

Land Value Theory

This is otherwise known as 'Alonso's Theory of Land Rent (Alonso 1960; 1964) Alonso general model follows Von Thune, Haig and Hurd in seeking to relate the intensity of land use to transportation costs. Though, Alonso was more concerned to extend Von Thunen's model of agricultural landuse to the spatial structure of the city. In the urban case, he develops an abstract model which is applicable to both forms and individual households as consumers of space (Ukpere, 2005).

According to Ukpere (2005), Alonso's theory assumes that the centre of the city is a highly desirable location, that land here is in short supply, and that users of urban land will make competitive bids for a site here. The user willing to pay most will be the one who will obtain the greatest returns from the site. The central parts of cities command high price, it is occupied by high order retail functions like department stores which need to be central to their market and office which need to be easily accessible to the labour pool.

Thus, by implication, the concentric zone model of Burgess derives support from the theory of urban land rent as outline above. The model shows the basic patterns of commercial and residential land use suggested by Burgess. It also helps to explain the population density model. Those who can afford commuting cost can buy a larger amount of land on the periphery for the same money as a smaller unit nearer the centre.

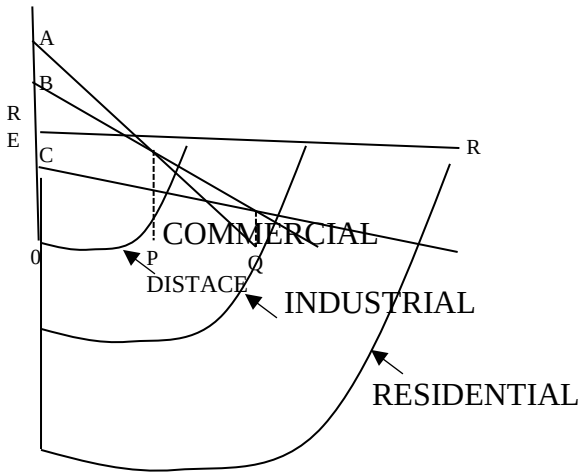

Fig. 2: Hypothetical rent-distance relationships within a city
(Modified after Garrison et al., 1959:64 in Ukpere, 2005).

3. METHODOLOGY

This paper used mixed-research design (field survey and experimental). This is due to the fact that the study involves experimental studies as well as social survey and face to face interactions with the local farmers.

Both primary and secondary sources of data were utilized with the primary data being the main trust of the paper. The primary data were generated through questionnaire and laboratory analysis of soil samples from 10 randomly selected points. Through the use of quota sampling technique, 447 copies of the questionnaire were randomly distributed to 447 farmers from the 10 selected communities in the area: Akwete, Obunku, Ohambele, Umuogor, Abaki, Azumini, Akirika,

Obohia, Mkporobe and Obuku. Composite soil sampling was carried out in both non-cultivated land and cultivated land at depth between 0 to 40cm.

Descriptive statistics (simple percentage, mean, frequency distribution tables) was used for data analysis while two-sample t-test statistics was used to test the hypothesis at 0.05 significant level.

4. RESULTS AND DISCUSSION

Question 1: What are the major anthropogenic activities going on in the geographical space of the area?

Table 1: Major Anthropogenic activities in the Area

S/N	Item		Responses			
		N	SA	A	D	SD
1.	Farming activities	447	168(37.6%)	155(34.7%)	79 (7.%)	45(10.%)
2.	Fire and generation	447	165(41.4%)	165(36.9%)	53(11.8%)	42(9.4%)
3.	Settlement expansion	447	178(39.8%)	150(33.5%)	60(13.4%)	59(13.2%)
4.	Infrastructural development	447	195(43.6%)	135(30.2%)	78(17.4%)	39(8.7%)
5.	Manila cutting down	447	188(42.1%)	140(31.3%)	89(19.9%)	30(6.7%)
6.	Road construction	447	190(42.5%)	142(31.7%)	90(20.1%)	25(5.6%)
	Grand total	**2682**	**1084**	**887**	**449**	**240**
	Percentage	**100**	**40.42**	**33.07**	**16.74**	**8.98**

Source: Researchers' Fieldwork and Analysis, 2024

Table 1 above showed the percentages of frequencies of responses of the respondents. 40.42%, of the respondents strongly agreed that the major anthropogenic activities in the area are: farming, firewood gathering, settlement expansion, infrastructural development, massive cutting down of trees for commercial purposes and road constructions. Another 33.075% others also agreed; while 16.74%% disagreed and another 8.98% also strongly disagreed.
In conclusion, it is clear from the analysis that the listed activities are the dominant anthropogenic activities going on in the area.

Question 2: Which communities are mostly prone to these anthropogenic activities in the area?

Table 2: Respondents' perception of communities mostly prone to anthropogenic activities in the area

S/N	COMMUNITIES	Responses				
		SA	A	D	SD	TOTAL
1	Akwete	198	102	89	58	447
2	Azumini,	180	120	68	79	447
3	Obohia	195	135	86	31	447
4	Obunku	179	149	80	43	447
5	Akirika	175	155	70	47	447
6	Ohanku	192	138	85	32	447
7	Mkporobe	165	155	70	57	447
8	Abaki	150	185	82	30	447

9	Ohambele	168	172	74	33	447
10	Umuogor	170	150	69	58	447
	Grand Total	**1,772**	**1,457**	**773**	**468**	**4,470**
	Percentage (%)	**39.64%**	**32.60%**	**17.29%**	**10.47%**	**100%**

Source: Researchers' field work and analysis 2024

Table 2 above showed the responses of the respondents on the most prone communities to identified anthropogenic activities in the area. 39.64% of the respondents strongly agreed that the listed communities are the most prone. These are: Akwete, Azumini, Obohia, Obunku, Akirika, Ohanku, Mkporobe, Abaki, Ohambele and Umuogor. Another 32.60% also agreed; while 17.29% disagreed and another 10.47% strongly disagreed. The study therefore concluded that the spotlighted communities are the most prone to anthropogenic activities in the area.

Question 3: Does the identified anthropogenic activities causes loss in soil quality (nutrient) in the area; and in what way?
The responses of the respondents from the ten communities are collapsed into the table below.

Table 3: Perceived effects of identified anthropogenic activities on soil quality (nutrients) in the Area

Item	**N**	**Frequency**			
		SA	**A**	**D**	**SD**
The identified anthropogenic activities leads to loss in soil quality (nutrients) in the Area	**447**	185(41.4%)	155(34.7%)	83(18.6%)	24(5.4%)

Sources: Researchers' fieldwork and analysis, 2024.

From the above table, out of the total 447 respondents from the ten communities,41.4% of them strongly agreed that anthropogenic activities in the area cause loss of soil nutrients in their farms; another 34.7% also agreed; while 18.6% disagreed and another 5.4% also strongly disagreed. The study therefore concluded that anthropogenic activities cause loss of soil quality in the area as testified by the farmers.

Table 4: The Exact Perceived ways in which the identified anthropogenic activities impacts on on soil quality (nutrients) in the Area

S/N	**Item**	**N**	**Responses**			
			SA	**A**	**D**	**SD**
1.	Continuous cultivation	447	178(39.8%)	150(33.6%)	62(13.9%)	57(12.8%)
2.	Settlement expansion activities	447	196(43.8%)	14(25.5%)	80(17.1%)	57(12.6%)
3.	Deforestation	447	190(42.5%)	145(32.4%)	57(12.8%)	55(12.3%)
4.	Road construction	447	180(40.3%)	120(26.8%)	89(19.9%)	58(13.%)
5.	Soil erosion	447	172(38.5%)	152(34%)	76(17%)	47(10.5%)
6.	Soil pollution	447	185(41.4%)	155(34.7%)	83(18.6%)	24(5.4%)
	Grand total **Percentage**	**2682** **100**	**1101** **41.05**	**836** **31.17**	**451** **16.82**	**298** **11.11**

Sources: Researchers' fieldwork and analysis, 2024.

Table 4 above showed the frequencies of responses of the respondents on the exact perceived anthropogenic activities that cause loss in soil quality/nutrients in the area. 41.05% of the respondents strongly agreed that continuous cultivation, settlement expansion, deforestation, road construction, soil erosion, and soil pollution or contamination are the various anthropogenic related activities that pose threat to soil quality (nutrients) in the area. Another 31.17 others also agreed; while 16.82% respondents disagreed, and another 11.11% also strongly disagreed. The study therefore concluded that the itemized activities are responsible for soil nutrients loss in the area. This was corroborated with the laboratory results on soil samples in the area as presented below.

S n	PARAMETERS	METHODS	SAMPLES										
			A	B	C	D	E	F	G	H	I	ᾱ	J
1	PH	Electrometric	5.0	4.5	4.3	4.7	4.1	4.5	4.1	4.5	5.3	4.6	5.6
2	Temp ^{0}C	APHA 255OB	27.3	27.1	26.7	26.5	27.0	26.4	27.0	26.4	22.7	26.3	26.06
3	Totalnitrogen mg/kg	ASTMD2973	0.14	0.11	0.10	0.10	0.09	0.10	0.09	0.10	0.15	0.10	42.34
4	Phosphorus mg/kg	ASTMD515	0.05	0.10	0.10	0.10	0.10	0.09	0.10	0.09	0.17	0.1	11.79
5	Total organic carbon %	ASTMD2974	6.54	6.24	6.12	5.90	5.10	6.25	5.10	6.25	6.15	5.96	34.21
6	Potassium mg/kg	APHA3111	4.65	3.62	2.95	3.45	4.25	3.40	4.25	3.40	2.75	3.6	7.75
7	Moisture %	APHA3547	3.83	4.15	3.23	3.10	3.45	2.95	3.45	2.95	3.43	3.4	12.03
8	TPH, mg/kg	ASTMD756	0.01	0.38	0.45	0.92	0.42	0.71	0.42	1.02	1.01	0.59	0.01
9	Total organic matter	ASTMD2973	12.5	8.23	6.45	4.25	6.98	5.71	6.98	5.71	6.43	7.0	26.67
Heavy Metals													
1.	Magnesium		0.07	0.95	0.68	0.97	0.95	0.96	0.05	0.95	0.78	0.64	0.54
2.	Zinc, ppm		0.09	0.68	0.95	0.96	0.85	0.76	0.09	0.68	0.67	0.63	0.53
3	Lead, ppm	APHA - 4654	0.08	0.98	0.95	0.98	0.96	0.94	0.08	0.98	0.84	0.75	0.54
4	Copper ppm		0.06	0.65	0.68	0.94	0.87	0.85	0.06	0.65	0.63	0.52	0.59
Particle Size Distribution (PSD)													
1.	% Silt	ASTML I36	18.92	10.3	10.1	9.87	9.45	12.45	10.33	10.1	10.9	13.38	2.6
2.	% Sand		72.49	84.1	74.4	68.5	75.3	68.5	84.1	84.4	80.6	76.98	5.5
3.	% Clay		6.42	5.23	4.25	3.30	4.45	4.95	5.33	4.25	9.05	8.24	2.95

Table 5: Result for laboratory analysis for soil samples
Source: Researchers' Laboratory Soil Analysis, 2024

pH values ranges between 4.1 - 5.3 with a mean value of 4.6 against the value for control (5.6), Temperature value ranges between 22.7 - 27.3 with a mean value of 26.3^{o}C against the value for control (26.06 ^{o}C), Total Nitrogen values ranges between 0.09 - 0.15mg/kg with a mean value of 0.10mg/kg against the value for control (42.34mg/kg), Phosphorus values ranges between 0.5 - 0.17mg/kg with the mean value of 0.1mg/kg against the value for control (11.79mg/kg), Potassium mg/kg values ranges between 2.75 – 4.65mg/kg with a mean value of 3.6mg/kg against the value for control (7.75mg/kg); Total Organic Carbon values ranges between 5.10 - 6.54% with

a mean value of 5.96% against the value for control (34.21%), Soil moisture content ranges between 3.10 – 4.15% with a mean value of 3.4% as against the value for control (12.03%).

TPH values ranges between 0.01 – 0.92 mg/kg with a mean value of 0.59 mg/kg as against the value for control (0.01 mg/kg), Total Organic Matter values ranges between 4.25 – 12.5 with a means value of 7.0 as against the value for control (26.67), Magnesium values ranges between 0.5 – 0.97mg/kg with a mean value of 0.64 as against the value for control (0.54mg/kg), Zinc, values ranges between 0.68 – 0.96 ppm with a mean value of 0.63ppm as against the value for control (0.53 ppm), Lead values ranges between 0.08 – 0.98 ppm with a mean value of 0.75 ppm against the value for control (0.54 ppm), Copper values ranges between 0.06 – 0.94 ppm with a mean value of 0.52 ppm as against the value for control (0.59 ppm). Silt values ranges between 9.45–18.92% with a mean value of 11.38% as against the value for control (12.5%), Sand values ranges between 68.50–84.35% with a mean value of 76.92% as against the value for control (65.50%), Clay values ranges between 3.30 – 9.05% with a mean value of 5.24% as against the value for control (22.95%).

Question 4: To what extent does decline in soil quality affects crop production in the area

Table 6: Extent to which decline in soil quality affects crop production in the Area

S/No	Items	N	Responses			
			VHE	HE	LE	VLE
1.	Cassava	447	196 (43.8%)	114 (25.5%)	80(17.9%)	57(12.8%)
2.	Potatoes	447	172 (38.5%)	152 (34%)	47(10.5%)	76(17%)
3.	Yam	447	180(40.3%)	120 (26.8%)	58 (13%)	89(20%)
4.	Melon	447	178 (39.8%)	150 (33.6%)	62(13.9%)	57(12.8%)
5.	Cucumber	447	185(41.4%)	155(34.7%)	83(18.6%)	24(5.4%)
6.	Maize	447	190(42.5%)	145(32.4%)	57(12.8%)	55(12.3%)
	Grand total	**2682**	**1101**	**836**	**387**	**358**
	Percentage	**100**	**41.05**	**31.17**	**14.43**	**13.33**

Sources: Researcher's fieldwork and analysis 2024

Table 6 above showed the extent to which decline in soil quality affects crop production in the area. 41.05% of the respondents argued that the extent to which decline in soil quality affects cassava crop production in the area is of very high extent (VHE), while 31.17% of the respondent says high extent (HE); while 14.43% said low extent (LE), and another 13.33% others very low extent (VLE). The study therefore concluded that decline in soil quality/nutrients in the area affects the production food crops (e.g. cassava, potatoes, yam, melon, cucumber, maize) to a very high extent. The farmers through our personal interactions with them, complained bitterly that the situation cause poor yield and low harvest And is also telling on their incomes.

Hypothesis Testing

Ho_1: There is no significance difference in soil macronutrients (NPK), soil moisture, TOC and TOM between cultivated and non-cultivated lands in the area.

To test this hypothesis which seeks to measure possible statistical difference in soil characteristics between cultivated soils and nor-cultivated soils in the area, two-sample t-test statistics was used.

Data for nor-cultivated land (control) served as data set one (a_1) while the mean values from the experimental sites served as data set two (a_2). The result of the computation is summarized here below.

Table 7: Summary of $t-test$ calculation

N_1	N_2	t- cal.	Df	Alpha level	Critical t	Result	Decision
6	6	8.24	10	0.05	2.228	Significance	H_o rejected

From table 7 above, calculated t (8.24) is greater than the critical t (2.228) under the degree of freedom of 10 at 0.05 significance level. Hence, the null hypothesis which stated that there is no significant difference in soil macro-nutrients (NPK), soil moisture, TOC and TOM between nor-cultivated lands and cultivated lands in Ukwa East is hereby rejected. This imply that there is statistically significant difference in the observed parameters between nor-cultivated and cultivated lands/soils in the area.

5. DISCUSSION OF FINDINGS

i. Anthropogenic activities in Ukwa East Local Government Area

Specifically, in pursuance of the achievement of stated objectives, the researcher is pleased to state that objective one was achieved since the paper was able to spotlight the major anthropogenic activities in the area.

Table 1 identifies the major types of anthropogenic activities in the area. These include farming activities, firewood fetching, settlement expansion, infrastructure development, and massive cutting down of trees for commercial (timber harvesting).

Findings on objectives one is in line with that of Bisong (2016). Objective one was achieved as the study was able to spotlight the main anthropogenic activities in the area.

ii. Areas prone to Anthropogenic Activities (Objective 2)

Objective was equally achieved. Table 2 spotlighted the communities most prone to anthropogenic activities in the area. These include: Akwete, Azumini, Obohia, Obunku, Akirika, Ohanku, Mkporobe, Abaki, Ohambele and Umuogor are communities in the Ukwa East Local Government Area that are mostly prone to acts of deforestation. Findings on objective two is in line with the work of Sterling (2019) and Ukpere and Aziba-alua (2018) which argued that areas of increase population and land pressures is associated with high rate of deforestation.

iii. Perceived effects of the identified anthropogenic activities on soil quality (nutrients) in the area (objective 3)

Objective three was equally achieved. Table 3 spotlighted the perceived effects of the identified anthropogenic activities on soil quality (nutrients) in the area. The perception of the respondents corroborated with the results of the laboratory analysis of soil samples in the area. The results revealed that cultivated soils have lesser values for most of the parameters except heavy metals and TPH which were higher in the cultivated than nor-cultivated areas. This finding is in line with the work of Oguguo (2021) on soil nutrients status and agricultural productivity of selected farmlands in Emohua Local Government Area of Rivers state. He opined that soil nutrients was

lesser in farmlands prone to continuous cultivation than those lands with no or very scanty record of cultivation.

iv. Ascertain if decline in soil quality affects crop production in the real four (objectives 4)
This objective was equally actualized. Table 6 captured the extent to which decline in soil quality affects crop production in the area with majority (69.3%) of the respondents arguing that decline in soil quality affects crop productivity to a very high extent in the area. Findings on objective four is in line with the work of Bisong (2016).

6. CONCLUSION

Every stated objective was accomplished. The study was able to achieve its aim. Different anthropogenic activities are going on in the area such as (farming, firewood gathering, settlement expansions, infrastructural development, massive cutting down of trees for commercial purposes and road construction. Ten communities were identified as most prone to anthropogenic activities in the area (Akwete, Obunku, Ohambele, Umuogor, Abaki, Azumini, Akirika, Obohia, Mkporobe and Obanku) as a result of continuous farming activities which has led to decline in soil quality and poor crop production in the area. It is obvious that farming is the main source of survival hence; the government should step in to safeguard the soils of the area by halting the trend in soil nutrients loss.

7. RECOMMENDATIONS

Based on the findings, the study recommended that:

1. Adequate and immediate adoption of measures aimed at regular monitoring of difference land use practices such as indiscriminate deforestation.
2. Adoption of afforestation policy through government agencies e.g. forest reserve or forestry.
3. Incorporate environmental planning strategy to check land use and ensure development control initiatives in the area.
4. Public enlightenment should be carried out on the dangers of wrong farming methods rather; the use of organic fertilizers should be encouraged.

REFERENCES

Agyei, Y. (2009). Deforestation in Sub-Shara Africa. *Technology Forum 8*, (1).

Isric, P. (2007). *World soil information.* http://www.isric.org/content/soter-publication.

Lambin, E. F. and Geist, H. J. (2013). Dynamics of Landuse and Landcover change in Tropical Regions- Annual Reviews Environ. *Resources, 28*, 205-241.

National Population Commission (NPC web, 2010). National population Estimates. *NPC*

National Population Commission (NPC, 2006). National population and housing census. *NPC*

Oguguo, A. N. (2021). Soil nutrients status and agricultural productivity of selected farmlands in Emohua Local Government Area of Rivers State. *Unpublished M.Sc. Dissertation,* Dept. of Geography and Environmental Studies, I.A.U.E.

Randolph, J.K. (2017). *Forest resources*. London: UCL Press.

Ukpere, D. R. T. (2005). Effects of waste dumps on landuse and property values in Port Harcourt. *Unpublished M.Sc Thesis*, Department of Geography & Environmental Management. University of Port Harcourt, Choba, Port Harcourt.

Ukpere, D. R. T. (2019), *"Urban Environmental Management crises in Africa; the menace of domestic sewage generation in Port Harcourt, Nigeria"* in Albert, I. O. & Lawauson. T. (eds.) urbanism and crisis management in Nigeria – essays in honour of Prof. A. I., Mabogunje. University of Ibadan Press.

United States Department of Agriculture (USDA, 2016). *Diminishing forests and biodiversity lost.* Paper No. 148. Washington: USDA.

Vitousek (2002). *Towards ecological understanding of biological nitrogen fiction*.

World Rainforest Movement (WRM, 2010). *Rain forest destruction – why?* www.wrm/worldforests/destruction/why?