



## Investigating The Impact of Erosion in Selected Area of Ilaro, Yewa South Local Governemnt Area of Ogun State, Nigeria.

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### ABSTRACT

This study critically investigates the impact of erosion in selected areas of Ilaro, Yewa South Local Government Area of Ogun State. For this research, four objectives were set in motion in order to achieve the aim of the study. A purposive sampling method was employed in the selection of erosion-ravaged areas. The areas are: Gbogidi, Orita, Pahayi, Sabo, Ona-Egbo and Patiko. The primary data sources were adopted through administration of two hundred (200) questionnaires using systematic sampling of which only 96% (192) of the questionnaires were returned. The study made use of Statistical Package for Social Sciences (SPSS) Version 20 (IBM Inc.) in analysing data collected. The impact of erosion was analysed using weighted mean response approach of descriptive statistical analysis. The results of this study show that erosion has negative impact on the selected areas; destruction of culvert, destruction of roads, utilities and services. Also laterite soil was found to be the dominant soil type (48.8%) in the study areas, which contributed to the frequent activities of erosion in the study areas. It was also found that majority of the roads in the areas were un-tarred (55.9%), with poor drainage systems (24.0%) resulting to uncontrollable erosion in the study areas. The research findings show that major cause of erosion problem in the study areas is the topography of the study area, poor drainage system and lack of maintenance. Therefore, government should provide adequate drainage system to control storm water during the raining season.

**Keywords:** Destruction, Drainage, Erosion, Yewa, Ilaro, Ogun State, Nigeria and Impact.

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### 1. INTRODUCTION

Erosion is an environmental phenomenon that is widespread across the world. It progressively causes devastating ecological havocs by destroying lives, properties, agricultural products, infrastructural and social amenities (Fubara, 1986). Water erosion comes in the form of rain and runoff. When the rain falls, it can break up the particles of the soil, (especially fine sand and silt) and disperse them. This destruction of soil increases with thunderstorms, or heavy rain. Runoff carries these particles to rivers, oceans, streams or lakes. However, Runoff occurs when water drifts down a slope, or surface, and is not absorbed into the soil. Runoff increases when soil is crusty, compacted, or is over hydrated, as in it can't absorb any more water. This runoff can carry off more rich topsoil.



Soil can also resist erosion. This depends on a variety of factors such as high amounts of animal and plant matter decomposed in the soil, the ability for water to percolate through the soil, and good soil structure creates good resistance to erosion. Fine sand, silty and loamy soil has good resistance. Urbanization is a process of human agglomeration in multifunctional settlement of a relatively substantial size (Oguntoyinbo, 1978). The urban areas are characterized by various developmental activities by man, which commences by felling of trees and removal of the vegetative cover which prevents the direct contact of both water and wind with the soil. The changes inflicted on soils by human-induced erosion over many years are significant and have resulted in valuable land becoming unproductive and often eventually abandoned (Pimentel et al., 1995; Young, 1998).

### 1.1 Statement of Research Problem

Erosion is a problem that needs to be controlled in order to forestall its danger in any community, soil is fundamental to all land use and care has to be taken to ensure that it is not misused or destroyed. Most of this erosion is caused by the interference of man through human activities and ignorance. Mismanagement in soil use greatly accelerates this erosion process. The most common type of erosion Nigeria is the gully erosion which stands as a perennial problem to some of our urban centres, such as Ilaro, Ayetoro, Molete in Ibadan, just to mention few. All these areas are all well known because; the spectacular sculptures and catastrophic features caused by erosion readily attract attention. The threats posed by such bewildering gullies to farmlands, roads and houses around it are enormous (Obaje, 2009). In this research, diverse impacts of erosion were investigated within the selected areas in Ilaro, Yewa South Local Government Area of Ogun State. In addition, types and causes of erosion, extent of damage and ways of curbing the menace were examined in the study area.

### 1.2 Aim and Objectives of The Study

The aim of this study is to investigate the impact of erosion in selected area of Ilaro, Yewa South Local Government Area of Ogun State. To achieve the stated aim, the following objectives were vigorously pursued. That is, to:

- i. Examine socio-economic characteristic of the residents in the erosion ravaged areas.
- ii. Analyse soil types and causes of erosion in the study areas.
- iii. Investigate the effects of erosion in the study areas.
- iv. Appraise the government effort in controlling erosion in the study area.

### 1.3 Study Area

The erosional ravaged areas were purposely selected within Ilaro, Yewa south local government Area of Ogun State were Gbogidi, Orita, Pahayi, Sabo, Ona-Egbo and Patiko.

### 1.3 Adopted Methodology

The methodology adopted on this study includes:

- Composition of primary data which comprise the use of questionnaire, personal interview, direct observation and the use of photograph, which further present the study area in pictorial form and photographs.
- Collection of secondary data from similar works on the subject such as maps and other information from the local planning authority in the area, data extracted from journals, newspapers, seminar papers, and textbooks.
- Purposive sampling method was adopted in the selection of the study areas while systematic sampling method was adopted to collect information from the household head/representative in the study areas
- Data collated were analyzed using the frequency and percentage to show the number of respondents that belong to each category of responses, the simple percentages was adopted to present the explanation so that the outcome can be generalized for the whole population.



## 2. LITERATURE REVIEW

Onyegbule (2010) defined erosion as a process whereby the surface layer of the soil is detached and carried by agents of denudation and a lower in the soil is exposed leaving a topographic roughness on the resulting landscape. Soil is one of our most precious resources, the loss of this resources through land degradation process in an urban areas such as erosion, is one of the most serious environmental problems we are faced with as a gradual process that occurs when the actions of water wind, and other factors eat away and wear down the land causing the soil to deteriorate or disappear completely. According to Murck, Skinner, and Porter (1996) Erosion is a single major process responsible for the lost of vast amount of soils worldwide. Erosion and low quality of water due to erosion and run off has often become a major problem around the world. Erosion is one form of soil degradation along with soil compaction, low organic matter, loss of soil structure, poor internal drainage, Salinization, and soil acidity problems. These other forms of soil degradation, serious in themselves, usually contribute to accelerated erosion; therefore humans obviously need to be much more knowledgeable about this problem.

According to the report of NEST (1991) stated that the impact of gully erosion in urban area ranges from devastation of roads within the town and major roads linking states. This has attracted both regional and National attention, as they impede the movement of goods and persons from one region to the other within the country, and further leading to loss of other valuable infrastructure. Other areas that gully erosion has devastated in Nigeria include Abariba (Abia State), Efon Alaye (Ekiti State) Nsukka and Ugwuaba area of Enugu state and Agulu Nanka gully site of Anambra State. In the eastern part of the country, the effect of the erosion is very obvious because of its disastrous nature and rapid progress. It is particularly severe in Abia, Imo, Anambra, Enugu, Edo, Ebonyi, Koggi, Delta and Gombe states. Anambra and Enugu state alone have over 500 active gully complexes, with some extending over 100meters long, 20meters wide and 15 metres deep. According to Nwafor, (2006) active erosion sites in Imo and Anambra states about 1.9 percent of land mass. In these areas, erosion is due mainly to the action of flood or running waters Erosion attacks human endeavors in various sectors. Its ugly effects can be seen both in rural and urban sectors of not only Nigeria but countries all over the world. In the urban sector, the danger of erosion manifest itself in the form of destruction of people's property (washed out houses) and the destruction of road and streets. Deep gullies often cut off the urban streets thereby denying the residents from motorized access to their houses.

## 3. RESULTS AND DISCUSSION

The data was generated using the research instrument that was adopted for the study. Questionnaires that sought the opinion of the residents on impact of erosion in the selected areas within Ilaro, Ogun state Nigeria. Samples of two hundred (200) questionnaires were administered of which One Hundred and Ninety-two (192) only were returned representing 96% of the administered questionnaires were returned.

**Table 1: Respondent's Socio-Demographic Information**

Respondents Location	Frequency	Percent
Ona-Egbo	38	19.8
Gbogidi	37	19.3
Sabo	39	20.3
Orita	34	17.7
Pahayi	24	12.5
Patiko	20	10.4
<b>Total</b>	<b>192</b>	<b>100</b>

Source: Author's field Survey 2019



The retrieved questionnaire within the selected areas are revealed in Table 1 above which is as follows; 38 respondents resides at Ona-Egbo which represents 19.8%, 37 respondents resides at Gbogidi representing 19.3%, 39 respondents lives at Sabo area which constitute 20.3%, while Orita, Pahayi, and Patiko respondents were 34 (17.7%), 24 (12.5%), and 20 (10.4) respectively.

**Table 2: Respondents' Socio-Economic Information**

Item Nos.	Variables	Frequency	Percent	
1	Age	20-30 years	8	4.2
		31-40 years	11	5.7
		41-50 years	85	44.3
		51-60 years	64	33.3
		Above 60 years	24	12.5
		<b>Total</b>	<b>192</b>	<b>100.0</b>
2	Educational Qualification	No formal Education	35	18.2
		Primary Education	87	45.3
		Secondary Education	62	32.3
		Tertiary Education	8	4.2
		<b>Total</b>	<b>192</b>	<b>100.0</b>
3	Marital Status	Single	40	20.8
		Married	121	63.1
		Widow	9	4.6
		Separated	22	11.5
		<b>Total</b>	<b>192</b>	<b>100.0</b>
4	Occupation	Farming	42	21.8
		Student/Apprentice	56	29.2
		Civil servant	5	2.6
		Trading	89	46.4
		<b>Total</b>	<b>192</b>	<b>100.0</b>
5	Household Size	1-3	146	76.0
		4-6	39	20.4
		7-9	5	2.6
		10 and above	2	1.0
		<b>Total</b>	<b>192</b>	<b>100.0</b>
6	Length of stay in the area	0-5 years	21	11.0
		6-10 years	45	23.4
		11-15 years	77	40.1
		16 years and above	49	25.5
		<b>Total</b>	<b>192</b>	<b>100.0</b>

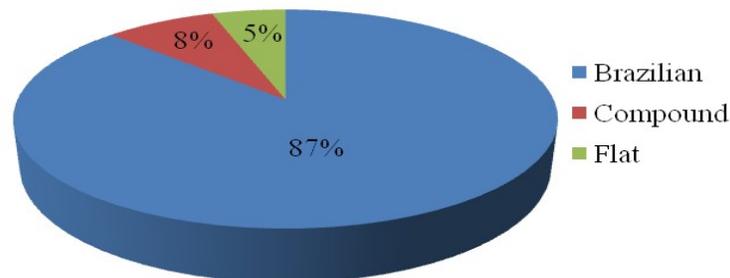
Source: Author's field Survey 2019



Table 2 depicts the frequency and percentage distribution of respondents' socio-economic information. It can be seen from age item no. 1, that majority of the residents were between 41-50 years old with 44.3% of the total respondents, followed by age range of 51-60 years with 33.3% of the total respondents. It can also be evidenced that 45.3% of the residents had primary education, and 32.3% had secondary education while 18.2% had no formal educational background only just 4.2% had tertiary education.

Also, analysis revealed in item number 3, that majority of the residents were married constituting 63.1% followed by the single ones 20.8% while separated and widow/widower constitutes 11.5% and 4.6% respectively. Distribution of respondents' household size can be clearly seen on item 5 of the table 2. Analysis indicates that 76.0% (majority) of the respondents said that their household size is between 1-3, 20.4% said their household size is between 4-6, while other residents indicated that they constitute larger household size ranging from 7-9 and above 10. Analysis of item 6, respondents' length of stay in the study area, the result shows that majority of the respondents have stayed between 11-15 years in the area which constitutes 40.1% of the total residents while 11.0% of the respondents have only stay in the area less than 5 years.

This implies that in the last decade, the study areas experienced low influx of people due to the problem of erosion in those areas this will have a negative effect on the community because it will quickly turn to blighted area if necessary action is not taken.



**Figure 1: Distribution on Type of Building**

Distribution of respondent perception on type of buildings erected in the study area can be evidenced from figure 1, that the majority of buildings erected in the study area were Brazilian type constituting 87%, 8% of the sampled buildings were compound type while the flat type constitutes 5% of the sample.



**Figure 2: Distribution on Height of Building**

The above figure 2 illustrate that 97.4% of the buildings in the study area were bungalows while 2.6% of the buildings were storey building

**Table 3: Accessibility and Drainage Availability**

Item Nos.	Variables	Frequency	Percent	
1	<b>Accessibility</b>	Tarred road	48	24.7
		Untarred road	107	55.9
		Footpath	37	19.4
		<b>Total</b>	<b>192</b>	<b>100.0</b>
2	<b>Drainage Availability</b>	Yes	45	23.4
		No	147	76.6
		<b>Total</b>	<b>192</b>	<b>100.0</b>
3	<b>Drainage condition</b>	Good	68	35.4
		Fair	77	40.1
		Poor	47	24.5
		<b>Total</b>	<b>192</b>	<b>100.0</b>

Source: Author's field Survey 2019

Table 3 above depict that majority of the roads within the study area were untarred with 55.9%, 24.7% of the roads within the study area were tarred while 19.4% of were accessed by footpath. This can be evidenced that the study area is not rapidly growing as expected which might be as a result of unexplained variations. However the result indicated that majority of the locations have no drainage which constitute 76.6% of the total responses, while only 23.4% of the residents said they have drainage in their respective locations.



Plate 1: Blocked Drainage along Tunde Ibikunle Road Patiko Area Ilaro



Plate 2: Destruction of road by erosion menace at Orita area in Ilaro



Plate 3: Collapse Drainage Olorunsogo Area, Sabo, Ilaro



Plate 4: Collapse Drainage at Ileba Area Sabo, Ilaro

**Table 4: Soil Classification in the Study Area**

Types	Frequency	Percent
Clay soil	30	15.7
Sandy soil	26	13.4
Loamy soil	42	22.0
Laterite soil	94	48.8
<b>Total</b>	<b>192</b>	<b>100.0</b>

Source: Author's field Survey 2019

Table 4 depicts the classification of soil found in the study area. The study revealed that laterite soil were found to be the most dominant soil in the area with 48.8% responses gotten from the residents, 13.4% of the location were found to be dominated with sandy soil while 15.7%, and 22.0% were dominated with clay and loamy soil respectively, the high volume of laterite soil in the study area made it easily washed away by erosion due to light in weight and porosity of the soil.



**Table 5: Causes and Effect of Erosion in the Study Area**

S/No.	Variables		Frequency	Percent
1	Causes of erosion in the area	Rainfall or runoff	62	32.3
		Slope gradient	37	19.3
		Deforestation	12	6.3
		Poor drainage channel	81	42.1
		<b>Total</b>	<b>192</b>	<b>100.0</b>
2	Is your house/property affected by erosion?	Yes	138	71.9
		No	54	28.1
		<b>Total</b>	<b>192</b>	<b>100.0</b>
3	Problems of erosion in the community	Foundation eroded	53	27.6
		Wall cracked	55	28.6
		Building collapse	40	20.8
		Road Destruction	44	23.0
		<b>Total</b>	<b>192</b>	<b>100.0</b>

**Source:** Author's fieldwork and computation, 2019.

Table 5 shows that the causes of erosion in the study area, about 32.3% of the residents said that rainfall or runoff were contributing factors to erosion, 19.3% of the respondents opined that slope gradient was the causes, 6.3% responded that it was due to deforestation while 42.3% constituting the majority said it was due to poor drain age channel. This indicates that poor drainage channel is the major cause of erosion in the study area. Effect of erosion on properties, 71.9% of the respondents claimed that their properties were affected while minority constituting 28.1% said it was not affected. However, the aforementioned erosion resulted in; eroded building foundation, wall cracked, building collapse and road destruction in the study area as evidenced by 27.6%, 28.6%, 20.8% and 23.0% of the respondents' perception.



**Plate 5:** Partially collapse road (Tunde Ibikunle road) at Patiko Area Ilaro



**Plate 6:** Crack wall and eroded Foundation at Alaraba area Patiko, Ilaro.



Plate 7 Building collapse at lower Mission due to erosional problem



Plate 8 Overflow of run-off water on the road due to drainage blockage

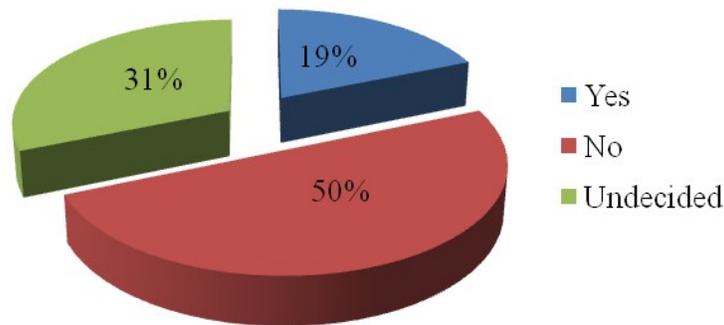


Figure 3: Erosion report to any government agency

The figure 3 above depict that 50% of the respondents' did not report any erosion menace to any governmental agency while 19% of the respondents admitted that they have made official report to the relevant authority through their community association and 31% percent were not aware whether there was a report to authority or not

**Table 6: Government is responsible erosion control in the study area**

Agency	Frequency	Percent
Local government	33	91.7
State government	3	8.3
Federal government	-	-
<b>Total</b>	<b>36</b>	<b>100</b>

Source: Author's field Survey 2019

The table 6 above depict that 91.7% of the respondents agreed that the local government area are responsible for erosion control in their area while 8.3% of the respondents admitted that it was state government, however, most of the area affected are street road which is the responsibility of local government to maintain.



**Table 7: Mean response on Efforts put in place to reduce erosion effect in the Study Area**

S/N	Variables	SD	D	U	A	SA	WF	WM	Decision
1	Contributing and working in hands to protect the soil surface with some form of cover	0	21	9	64	98	815	4.24	A
2	Residents in the community retain trees planted in the neighbourhood to control erosion in their environment	0	35	9	60	88	717	3.73	A
3	Construction of drainage system and maintaining the available ones for direct flow of water	1	129	45	8	10	469	2.44	SD

Results presented as number of participants. Sales Performance was assessed by giving 1 to SD, 2 to D, 3 to U, 4 to A, and 5 to SA. Reversed questions were coded otherwise.

**Source:** Author's fieldwork and computation, 2019.

**Weighted Mean intervals and decision rules on Likert Scale Question**

Strongly Agree (SA) = 4.5 - 5.0; Agree (A) = 3.5 - 4.4; Undecided (U) = 2.5 - 3.4  
 Disagree (D) = 1.5 - 2.4; Strongly Disagree (SD) = <1.5  
 WF = Weighted Frequency; WM = Weighted Mean

Table 7 indicates the residents' mean response in solving the community from erosion. Analysis shows that they have been working in hands to protect the soil surface with some form of cover and retaining the trees planted in the community to control erosion in their various environment as evidenced in the weighted mean of 4.10 and 3.91 respectively. However, weighted mean of 2.43 was found that there was no construction of drainage system, also the available ones was not maintain to have direct flow of water which has negative impact on the existing roads



Plate 9: Community's effort of using sacks filled with sand to mitigate the effect of erosion on roads at Ona-Egbo area in Ilaro



Plate 10: Clearing of blocked drainage on the major road (Tunde Ibikunle road) at Patiko area, Ilaro



#### 4. CONCLUSION

This research work identified that the problems of erosion in the selected area are readily increasing and posing danger on environmental sustainability. This means that the erosion problems did not receive adequate attention. However, through the administration and analysis of questionnaire it was concluded that major cause of property destruction in the study area is erosion; this is due to the topography of the study site, poor drainage system and lack of maintenance.

#### 5. RECOMMENDATION

To achieve a true sustainability and an erosion free environment requires some level of dedication with highly coordinated and holistic efforts of every member of our community. Therefore, the solutions are embedded in both long-term and short-term measures which the government, public and private individual can adopt in order to have sustainable environment. These recommendations are:

- a. There should be regular maintenance of roads to keep drains and culvert clean so as to prevent flooding and also installing diversion at drains and culverts where runoff velocity can cause erosion.
- b. There should be massive public awareness campaign on the problems and consequences of gully erosion, as well as enacting environmental laws and serious penalties for offenders.
- c. The community should be encouraged and advised to contribute their quota in addressing the problem through local means and other method such as agro-forestry system, planting trees along the streets as well as other local factors that can mitigate the erosion menace.
- d. Landlord/property owner in the study area should be encouraged to construct drainage at the front of their property in order to increase the number of drainage to carry run-off water and also to reduce shallow wells or catchment pits.
- e. There should be public awareness on the need to encourage planting off lawn within individual compound/corporate organization establishment and minimise the concrete paving



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