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THE EFFECTS OF DEFORESTATION ON THE LANDSCAPE OF EKPOMA, EDO STATE, NIGERIA

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Abstract

This paper investigates the effects of deforestation on the landscape of Ekpoma, Edo State, Nigeria. Deforestation, broadly defined as the large-scale removal of forest cover, has emerged as a critical environmental concern in Nigeria, particularly in rapidly growing urban areas like Ekpoma. Deforestation which is driven by population growth, agricultural expansion, and infrastructural development, alters the natural landscape and disrupts ecological balance. Deforestation is often considered as a necessary precursor to development and infrastructure expansion, the ecological consequences are far-reaching, extending beyond climate change and biodiversity loss to directly impacting the stability and longevity of the environment. Landscape refers to the visible features of an area of land, including natural elements such a mountains or water, and human-made structures, often viewed for its aesthetic appeal This paper identified, examined and investigated the major causes of deforestation in Ekpoma, what constitute the landscape of Ekpoma, the effects of deforestation on the landscape in Ekpoma, and the coping/intervention strategies adopted to alleviate the effects of deforestation on the landscape of Ekpoma, Edo State, Nigeria. To achieve these laudable objectives, the researcher used both primary and secondary research methods to collect the requisite data for the study. Three hundred (300) respondents which represent 0.166% (point one six six percent) of the population in the study area were considered. Consequently, the three hundred (300) questionnaires were administered in the study area using random and convenience sampling methods. The preliminary and actual field surveys conducted revealed that the population is unevenly distributed across the study area. Owing to the above observation, the questionnaires were distributed in the various communities in reflection of their population sizes. The data obtained were collated and analysed using tables, graphs and, percentages. The results obtained reveal the major causes of deforestation in Ekpoma, what constitute the landscape of Ekpoma, the effects of deforestation on the landscape in Ekpoma, and the coping/intervention strategies adopted to alleviate the effects of deforestation on the landscape of Ekpoma, Edo State, Nigeria. Consequent upon the findings of this paper, the following actionable policy recommendations

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are made: effective, efficient, and regular creation and promotion of community awareness, green infrastructure, planting of cover crops, planting all-season green tropical tree crops, practicing soil conservation, reafforestation, the implementation of green building initiatives, controlled lumbering, prohibition of laws against bush burning, controlled use of wood as fuel, planting of fast growing trees, planting of fast regenerating trees, enforcement of environmental regulation, adoption of environmental building codes, and construction of drainage channels. So, this paper is concluded by imploring the governments at all levels (wards, local, state, and national) to implement the list of recommendations made by the researcher in this paper.

Keywords: Effects, Deforestation, Landscape. Intervention

1.0 Background to the study

The rapid expansion of human activities, including agriculture, commercial logging, mining, and urbanization, has led to the widespread practice of deforestation. There is a very strong link among forest (a complex ecological system dominated by trees), deforestation, and landscape. Deforestation is the clearing of forests for non-forest use (Seymour & Busch, 2016). Deforestation is the removal and destruction of a forest or stand of trees from land that is then converted to non-forest use (Olson & Cihacek, 2022). The Oxford Advance Learner's Dictionaries (2026), defines deforestation as the removal of trees from a large area of land, usually to use the land for something else. From the above, deforestation could be referred to as the uncontrolled destruction or removal of forests and forest products for non-forest use. According to the Oxford Advance Learner's Dictionaries (2026), landscape refers to everything you can see when you look across a large area of land especially in the countryside. From the foregoing, landscape can be conceived of as the visible features of an area of land, including natural elements such a mountains or water, and human-made structures, often viewed for its aesthetic appeal.

Deforestation which is often considered as a necessary precursor to development and infrastructure expansion, the ecological consequences are far-reaching, extending beyond climate change and biodiversity loss to directly impacting the stability and longevity of the environment (Olson & Cihacek, 2022). Forests play a crucial role as natural stabilizers; their roots provide mechanical reinforcement that increases soil shear strength, and the canopy and litter layers regulate the water cycle by interrupting heavy rainfall and enhancing infiltration, thereby reducing surface runoff (FAO, 2010; Tripathi *et al*., 2020). The removal of this forest cover, fundamentally alters the natural geo-hydrological balance, accelerating soil erosion, increasing the risk of landslides and slope failures (Alcantara-Ayala *et al.*, 2006), and aggravating flooding. These hazards pose immediate and continuous threats to civil engineering infrastructure and built structures globally.

The town of Ekpoma, a major urban and academic center in Edo State, Nigeria, provides a critical, localized example of these effects. The town's unplanned growth (rapid) due to the presence of Ambrose Alli University has caused intense pressure and significant deforestation in its landscape (Adavbiele *et al*., 2006; Salufu & Ujuanbi, 2015). Ekpoma is situated on the Esan Plateau, an area characterized by thick laterite deposits (Okoro & Emakpor, 2016). The removal of the protective rainforest canopy in this specific geo-environment dramatically amplifies geohazards, particularly severe gully erosion (Aziegbe, 2006). Deforestation removes the soil-binding function of tree roots, making the lateritic subsoil highly susceptible

to surface runoff, which rapidly carves out and expands deep gullies that undercut and swallow buildings, roads, and utilities (Aziegbe, 2006; Umotong, 2021). Furthermore, the high runoff from deforested areas, combined with the impermeable laterite and inadequate urban drainage, leads to seasonal flash flooding and accelerated structural degradation (Adavbiele *et al*., 2006). This process also generates vast amounts of sediment that block drainages and accelerate the deterioration of the built infrastructure (Aziegbe, 2006).

2.0 Statement of the Problem

Some studies have been carried on the effects of deforestation on the landscape. For instance, Udom and Akpabio (2017) investigated road failure in Cross River State due to coastal and stream bank deforestation and they noted that the absence of riparian roots led to lateral bank erosion, causing the collapse of retaining walls and bridge abutments, thereby linking geo-instability directly to linear infrastructure failure. Adepoju *et al.*, (2016) worked on the mitigation strategies on the effects deforestation. They emphasized the introduction of the concept of green infrastructure, which emphasizes the role of natural systems in enhancing urban resilience. In addition, Anekwe, & Ezeh, (2019), studied the role of deforestation and bush clearing in shallow landslide incidence in Enugu, Nigeria and they observed that reduced soil moisture retention leads to surface runoff concentration, undermining slopes supporting critical infrastructure like utility poles and minor roads.

From the available studies (some of which were reviewed in this current study), it is obvious that while the global and regional link between deforestation and environmental instability is established, specific empirical research quantifying the physical and economic damage inflicted by these deforestation-induced geohazards on the landscape within Ekpoma remains scarce, if none existent. In fact, there is no known research on the effects of deforestation on the landscape of Ekpoma (the study area) that is known to the researcher. This identified research gap is what this study intends to fill scientifically. So, this study aims to systematically investigate and document the tangible effects of deforestation on the landscape of Ekpoma, providing crucial localized data to inform sustainable land-use planning and the coping/intervention practices in place in Ekpoma and similar rapidly urbanizing areas on the Esan Plateau in particular and the globe in general.

3.0 Aim and Objectives of the study

The overall aim of this study is to investigate the effects of deforestation on the landscape in Ekpoma, Edo State, Nigeria. The specific objectives are to:

(i) examine the major causes of deforestation in Ekpoma;
(ii) examine what constitute the landscape of Ekpoma;
(iii) investigate the effects of deforestation on the landscape in Ekpoma; and
(iv) examine the coping/intervention strategies adopted to alleviate the effects of deforestation on the landscape in Ekpoma.

4.0 Study Area

The study area is Ekpoma. It is one of the seven clans that constitute the Esan West Local Government Area, and one of the 35 kingdoms that constitute Esanland, Edo State, Nigeria (Eseigbe, 2011; Ehisuoria, 2012; Ehisuoria & Ilenre, 2018). Ekpoma lies approximately between latitudes 06^0 04^1 and 06^0 45^1 North of the Equator and longitudes 06^0 05^1 and 06^0 10^1 East of the Greenwich Meridian (Ojiefo, 2005; Eseigbe, 2011; Ehisuoria, 2012; Ehisuoria & Ilenre, 2018). The study area comprises 12 communities: Eguare, Emaudo, Ujoelen, Ukpenu, Uhiele, Illeh, Emuhi, Iruekpen, Uke, Ihumudumu, Idumebo, and Ujemen. Ekpoma is located in the humid tropics so, it has the humid tropical climate characterized by wet and dry seasons. The climate is controlled by the position of the ITCZ. The northerly and southerly

movements of the ITCZ throughout the year are marked by the outset of the wet and dry seasons (Eseigbe, 2011; Ehisuoria, 2012; Ehisuoria & Ilenre, 2018). The hottest period of the year in the study area is recorded from January to March (34^0C), while the lowest temperature is recorded between June and July (24^0C).

The soils in Ekpoma are ferri soils on loose sandy sediments. These soils are less leached and consequently retain water and encourage agricultural production. The soils encourage and support the production of both food and cash crops.

The economic activities of the people of Ekpoma encompass agricultural and non-agricultural sectors. The agricultural sector includes crop cultivation and animal grazing. The crops cultivated include food crops (yams, maize, cocoyam, pepper, plantain, banana, and pineapple) and cash crops (cocoa, oil palm, cashew, pear, orange rubber, and ducanut). The domesticated animals are goats, dogs, cows, and sheep. Poultry farming is also a famous agricultural activity carried out by the people of Ekpoma. The non-agricultural sector is industrialized. The industrial sector of Ekpoma comprises both agro and non-agro-based industries. The agro-based industries include cassava grating, rice processing and milling, vegetable oil processing, and palm oil milling. The non-agro-based industries in the study area include block molding, black smiting, welding, vulcanizing, hair dressing, entertainment/hospitality, banking, and other industries (Eseigbe, 2011; Ehisuoria, 2012; Ehisuoria & Ilenre, 2018).

The Ekpoma population is relatively high. The 1991 population census estimated the population of Ekpoma at 45,488 persons. The population of the study area in the 2006 population census rose astronomically (though the figures for the locality are not made available by the NPC). However, the population census conducted in 2006 estimated the population of Ekpoma at 127,718. Today, (2026), the population of Ekpoma is estimated to be 180,491, at a 2.5% growth rate. Because of the pull factors of Ambrose Alli University, Esan West Local Government Council, and Irrua Specialist Teaching Hospital, which are located in and around the study area, Ekpoma has over 70% of the total population of Esan West Local Government Area. The population of Ekpoma is made up of both indigenes and non-indigenes (Ojiefo, 2005; Eseigbe, 2011; Ehisuoria & Ilenre, 2018). Non indigenes are immigrants who are either staff or students of Ambrose Alli University, Ekpoma, staff of Irrua Specialist Teaching Hospital, staff of Esan West Local Government Council, ministries, and parastatals. The other non-indigenes are the workers employed by trading activities and industries located to service the University, Esan West Local Government Council, and Irrua Specialist Teaching Hospital such as the banks, schools (public and private), and hotels (Ojiefo, 2005; Ehisuoria, Ehisuoria & Ilenre, 2018).

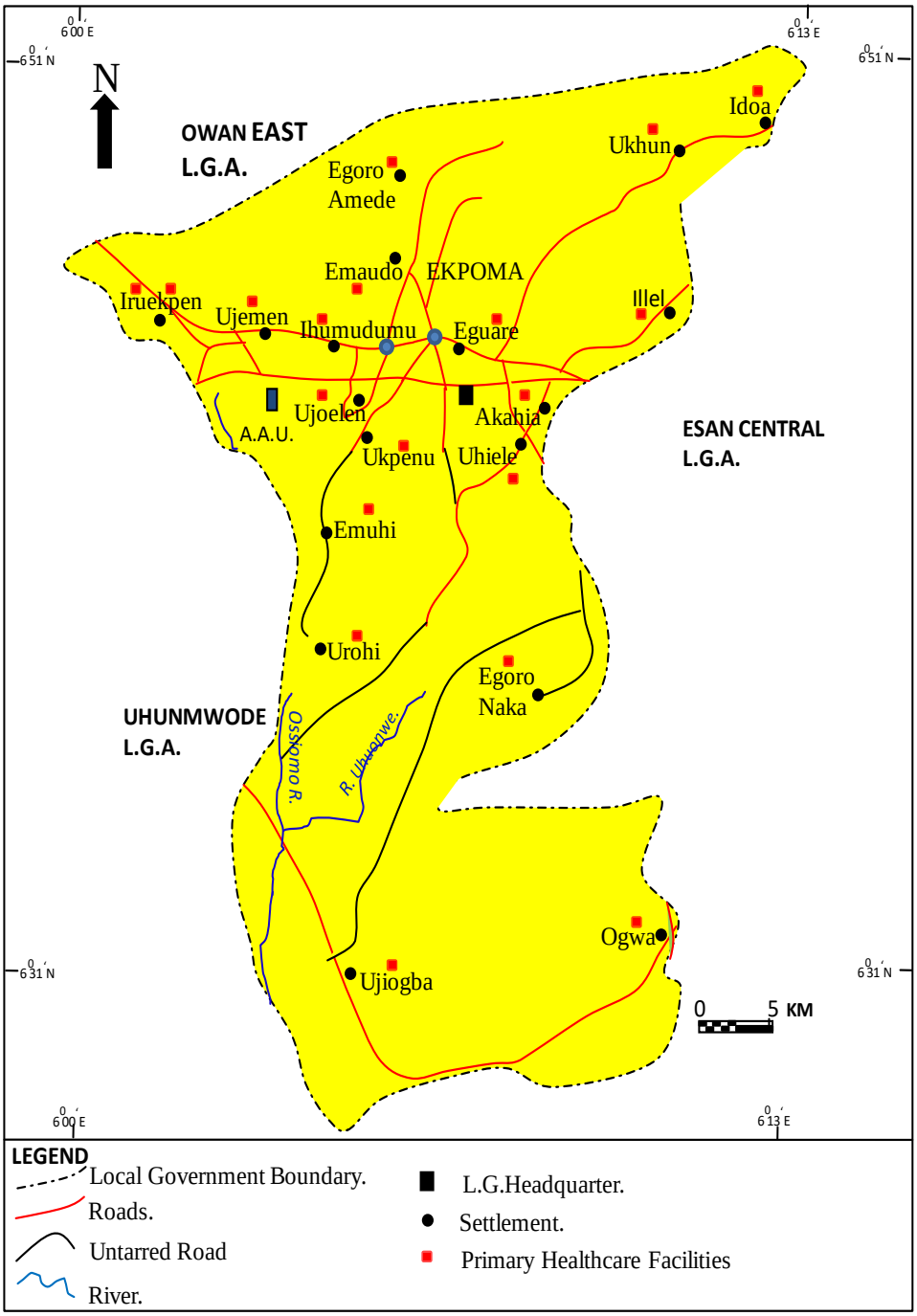

FIG : 1.1 **LOCATION: ESAN WEST LOCAL GOVERNMENT AREA** .
SOURCE: Cartography Studio, A.A.U.Ekpoma, 2017.

5.0 Conceptual Framework and Literature Review

5.1 Conceptual Framework

Deforestation, broadly defined as the large-scale removal of forest cover, has emerged as a critical environmental concern in Nigeria, particularly in rapidly urbanizing areas like Ekpoma. Deforestation which is driven by population growth, agricultural expansion, and

infrastructural development, alters the natural landscape and disrupts ecological balance. Akinyemi *et al*., (2017) observed that the weakening of environmental regulations and poor land-use planning have exacerbated forest loss across southern Nigeria. This loss of vegetation cover significantly affects the hydrological cycle by increasing surface runoff and reducing soil cohesion, thereby setting the stage for erosion and flooding. Adepoju, Millington, and Tansey (2016) emphasize the utility of remote sensing and GIS in monitoring these land cover changes, which are essential for understanding the spatial dynamics of environmental degradation.

The removal of vegetation cover leads to geo-hydrological instability, a term that encompasses processes such as gully erosion, flash flooding, and soil degradation. In Ekpoma, where the terrain is undulating and rainfall is intense, deforestation accelerates the formation of gullies that undermine the foundations of buildings and infrastructure. Ezezika and Adetona (2011) highlight how gully erosion in southeastern Nigeria has led to the collapse of roads and buildings, a pattern mirrored in Ekpoma's urban fabric. Ogunleye, Odewumi, and Akinluyi (2014) further argued that the vulnerability of built structures in such regions is compounded by inadequate drainage systems and unregulated construction practices. The interaction between hydrological forces and structural integrity is thus a critical concern for urban resilience and disaster risk management.

The spatial correlation between deforestation and structural damage can be conceptualized through the lens of landscape ecology and urban vulnerability. Areas experiencing rapid forest loss often coincide with zones of infrastructure failure, as vegetation plays a very vital role in stabilizing soil and regulating water flow. Igbokwe *et al.,* (2008) demonstrate how GIS-based spatial analysis can reveal these patterns by overlaying deforestation maps with damage assessments. Adebayo and Zubair (2012) maintained this approach, noting that such tools are indispensable for identifying high-risk zones and informing targeted interventions. This spatial relationship underscores the need for integrated environmental and infrastructural planning.

The economic and social implications of deforestation-induced geohazards are profound. Direct costs include the repair and reconstruction of damaged buildings, roads, and public utilities, while indirect costs involve displacement, reduced land value, and loss of livelihoods. Nwafor (2006), estimates that climate-related infrastructure damage costs Nigeria billions annually, a burden disproportionately borne by vulnerable populations. In Ekpoma, these impacts are intensified by limited access to engineering expertise and weak institutional capacity. Ogunleye *et al.,* (2014) noted that such environmental injustices reinforce cycles of poverty and marginalization, making it imperative to address the root causes of vulnerability.

Mitigation strategies must therefore, encompass both ecological restoration and structural adaptation. Reafforestation, erosion control measures, and climate-resilient infrastructure are key components of sustainable urban development. Akinyemi *et al*., (2017) advocate for the integration of environmental data into planning processes to ensure that future developments are resilient to geohazards. Adepoju *et al.,* (2016) and FAO (2022) introduce the concept of green infrastructure, which emphasizes the role of natural systems in enhancing urban resilience. By aligning ecological and engineering solutions, it is possible to safeguard the built environment in Ekpoma and similar contexts from the cascading effects of deforestation.

5.2 Theoretical Review

This loss of regulatory capacity is detailed by the Soil Bioengineering and Geo-hydrological Stability Theory. This Theory explains the physical role of vegetation in preventing mass soil movement and regulating water flow. On the mechanical side, tree roots act as natural anchors, reinforcing the soil matrix and significantly increasing the soil's shear strength through a process often termed "live spiling" (FAO, 2010). The destruction of the root network diminishes this reinforcement, increasing the susceptibility of slopes and surface soils to failure. Hydrologically, the forest canopy and litter layer intercept rainfall, reducing the impact of raindrops (splash erosion) and promoting deep infiltration along root channels, which minimizes the volume and velocity of surface runoff (Alcantara-Ayala *et al.*, 2006). When this natural system is destroyed, the resulting high runoff rates and loss of soil binding agents accelerate surface erosion and increase the pore water pressure in the remaining soil, setting the stage for landslides and slope instability (FAO, 2010; Tripathi *et al.*, 2020).

These instabilities manifest locally as Geomorphological Hazards, particularly the severe gully erosion and flash flooding observed in Ekpoma. The local geology of Ekpoma, characterized by the Esan Plateau's thick laterite deposits (Okoro & Emakpor, 2016), is highly sensitive to the mechanisms described above. Lateritic soils tend to form a semi-impermeable surface when exposed, which, coupled with high annual rainfall and poor urban drainage, means the massive runoff generated from deforested areas is not absorbed but is instead violently concentrated. This process aligns with the findings that rapid, unplanned urbanization-as witnessed with the growth of Ambrose Alli University creates intense pressure that exacerbates natural vulnerabilities, leading to the rapid carving of deep gullies that systematically undermine the foundations of adjacent infrastructure and homes (Aziegbe, 2006; Adavbiele *et al*., 2006; Salufu & Ujuanbi, 2015). The subsequent impact on the structural durability and longevity of the built environment where buildings, roads, and utilities lose their lateral and vertical support due to undermining the role played by forest are subject to accelerated material degradation from chronic flooding and sedimentation provides the empirical focus for this investigation (Aziegbe, 2006; Umotong, 2021). Thus, the study is theoretically positioned to link the macro-scale process of deforestation to the micro-scale consequence of structural failure through the mediating mechanisms of geo-hydrological instability.

5.3 Empirical Review

The current investigation into the impacts of deforestation-driven effects on landscape in Ekpoma is strongly supported by a diverse body of global and regional empirical evidence that links land-use change to severe geo-hazards. A critical starting point is the work focusing on similar environments in Nigeria and across the globe, which established the direct consequence of deforestation (loss of vegetation cover). For instance, Egboka and Nwankwoala (2018) conducted a geomorphic assessment of accelerated gully erosion in Southeastern Nigeria, where their methodology combined geological mapping, field measurements of gully migration (finding rates up to 5m/year), and interviews with affected residents. Their findings documented the collapse of road segments and the failure of numerous residential foundations, leading to the conclusion that poor land-use planning following rapid deforestation creates a geotechnical instability demanding bio-engineering solutions. Similarly, Ozioko and Ahaneku (2020) focused on the economic costs of this damage in Umuahia, Abia State. Using direct financial assessment and market valuation techniques, they estimated that the repair costs for severely affected properties often ranged from 45% to 60% of the original construction cost, highlighting that the environmental cost is externalized as a massive economic burden on local communities.

Expanding this regional focus, Olorunfemi and Jimoh (2016) quantified the socioeconomic impacts of gully erosion in Ibadan (Oyo State), noting forced migration and calculating structural damage to private homes averaged NGN 5 million, emphasizing the massive long-term cost of environmental mismanagement beyond initial construction. Closer to the study area, Ighalo and Osaigbovo (2021) used GIS to map vulnerability to gully erosion in Ekpoma, specifically identifying areas of rapid commercial development (linked to tree removal) as having the highest risk index and correlating this spatially with documented cases of failed foundations and utility infrastructure disruption within the municipal area. Furthermore, Anekwe and Ezeh (2019) examined the role of extensive bush clearing in shallow landslides in Enugu. They found that reduced soil moisture retention leads to surface runoff concentration, undermining slopes supporting critical infrastructure like utility poles and minor roads.

Further geotechnical studies provide context for the lateritic soils found in Ekpoma and the resulting infrastructure vulnerability.

This physical vulnerability is confirmed at a broader scale by Gyssels and Poesen (2005), whose statistical meta-analysis of over 180 global hillslope studies quantified the protective function of vegetation. Their comprehensive methodology determined that deep root systems can increase soil shear strength by up to 100%, and the forest layer can reduce soil loss by over 90% compared to bare land, providing fundamental empirical support for the Soil Bioengineering Theory. Jones and Schmidt (2015) explored the role of lateritic soil characteristics in gully initiation post-clearing in West Africa. Through laboratory testing of deforested and forested soil samples, they found that the deforested lateritic soils exhibited significantly reduced hydraulic conductivity and higher dispersivity. They concluded that the inherent vulnerability of lateritic soils is dramatically amplified by the absence of root reinforcement, making the soil's critical shear stress threshold easily breached

The link between land-use change and vulnerability to linear infrastructure, such as roads and drainage, is also well-established through geospatial methods. Li and Fang (2012) used time-series Landsat imagery and a hydrological model (HEC-HMS) in Southern China to show that a 15% increase in deforestation led to a 30% increase in peak flood discharge, directly correlating with bridge scour and frequent road washouts. This demonstrated the effectiveness of geospatial techniques in quantifying the spatio-temporal relationship between deforestation and infrastructure failure. Following a similar approach, Dube and Nare (2019) in Harare, Zimbabwe, used drone-based photogrammetry to monitor road embankments adjacent to urban sprawl and deforestation zones, concluding that instability was attributed to increased saturation and reduced basal friction following runoff concentration. Extending this analysis to broader utility infrastructure, Al-Wali and Jaber (2017) studied a major reservoir where catchment deforestation had caused a tripling of the siltation rate over a decade, compromising the dam and water intake structures and thereby extending the scope of deforestation damage to systemic regional infrastructure.

Addressing the issue of poorly managed urban development, Osadebe and Ochieng, (2021) analyzed African peri-urban areas, finding that infrastructural damage is not solely due to deforestation, but is greatly accelerated by the synergistic effect of poor construction and the systemic blockage of drainage systems in zones of informal residential use. Zuo and Zhu (2014) provided insight into effective mitigation strategies by monitoring two catchments in the Loess Plateau, one treated with check dams and another with re-afforestation. Similarly, Gambo and Bala (2020) reviewed policy responses to erosion in Nigeria, concluding that reliance on rigid structural measures like concrete channelization, without integrating bio-

engineering (re-afforestation of buffer zones), often accelerated downstream erosion and shifted the damage, arguing for comprehensive, root-based stabilization. Finally, these studies collectively affirm the methodological validity and critical urgency of investigating the specific case of Ekpoma, leveraging geotechnical context, and economic assessment to link deforestation to quantifiable structural damage.

6.0 Materials and Methods

The data required for this study were collected from both primary and secondary sources. The primary source formed the major source of data needed for this paper. The primary data were collected by the administration of structured questionnaires, and personal observation in the field. At present, the projected population of the study area (Ekpoma) is 180,491persons, at a 2.5% growth rate (after, NPC, 2006). Out of this projected population figure, 300 respondents which represent 0.166% (point one six six percent) of the population in the study area were considered. Following the above, three hundred questionnaires were administered across the study area. The preliminary and actual field surveys revealed that population is not evenly distributed across Ekpoma (the study area). Owing to the above observation, the questionnaires were distributed in the various communities in this proportion: Iruekpen (40), Ujemen (20), Uke (10), Idumebo (20), Ihumudumu (25), Ujoelen (25), Ukpenu (25), Eguare (40), Emaudo (25), Illeh (20), Uhiele (30) and Emuhi (20). All the questionnaires were painstakingly retrieved and used for the study. Random and convenience sampling techniques were used to select the respondents for interview. Questions were asked on the causes of deforestation, what constitute the landscape of Ekpoma, the effects of deforestation on the landscape in Ekpoma, and the coping/intervention strategies adopted to alleviate the effects of deforestation on the landscape in Ekpoma, Edo State, Nigeria.

The secondary data used in this paper include the population data as generated by the National Population Commission (NPC), Esan West Local Government Council, textbooks, internet, articles in journals, magazines, gazetteers, and conference papers. The data collected were collated and analysed using apt cartographic and statistical techniques-tables, frequencies and percentages.

7.0 Results and Discussion

Deforestation in any particular area is largely dependent on the level of awareness and economic activities in the area. Some of these awareness and economic activities include orientation, education, farming, urbanization, industrialization, logging, mining, climate change, and amongst other activities. These factors work individually or in combination to encourage deforestation in one way or another in Ekpoma, Edo State, Nigeria.

7.1 The Major Causes of Deforestation in Ekpoma

The field survey conducted reveals the major causes of deforestation in Ekpoma, Edo State, Nigeria. The survey also reveals that these causes are mainly anthropogenic. Table 1 shows that agriculture, urbanization, industrialization, lumbering, mining, bush burning and climate change are the major causes of deforestation in Ekpoma, Edo State, Nigeria. Specifically, it reveals that 110 (36.67%) respondents are of the opinion that agriculture is by far the major cause of deforestation in the study area and it is followed by urbanization which recorded 98 (32.67%) of the sample population. Out of the 300 respondents considered, 40 (13.33%) respondents are of the opinion that bush burning is a major cause, logging recorded 20 (6.67%) respondents, climate change recorded 18 (6.00%) respondents, mining recorded 8 (2.67%) respondents, and finally industrialization which attracted the lowest respondents recorded 6 (2.00%) of the sample population in the study area. This result strongly affirms the earlier findings of Adepoju, Millington, and Tansey (2016) and Akinyemi *et al*., (2017) that

agriculture and urbanization are by far the most direct cause of deforestation, with other major causes being logging, mining, wildfires and climate change.

Table1: The major causes of deforestation in Ekpoma

The major causes of deforestation in Ekpoma	Frequency	Percentage (%)
Agriculture	110	36.67
Urbanization	98	32.67
Industrialization	06	2.00
Logging	20	6.67
Mining	08	2.67
Bush burning	40	13.33
Climate change	18	6.00
Total	300	100.00

Field survey, 2026

7.2 The Constituents of the Landscape of Ekpoma

Table 2 shows clearly that 300 questionnaires were administered to respondents in the study area as regards the constituents of the landscape of Ekpoma and 102 (34.00%) respondents are of the opinion that farms/farmland rank highest in the study area. buildings with 72 (24.00%) respondents is next on the ranking and it is followed by plain lands which recorded 45 (15.00%) respondents. Others are Valleys/geosynclines, 29 (9.67%) respondents, roads and transmission lines (electricity, communication and oil pipe) recorded 22 (7.33) respondents each while water bodies ranked lowest and it recorded 8 (2.67%) respondents of the sample population in the study area.

Table 2: The Constituents of the Landscape in Ekpoma

The Constituents of the Landscape of Ekpoma	Frequency	Percentage (%)
Plain lands	45	15.00
Valleys/geosynclines	29	9.67
Buildings	72	24.00
Roads	22	7.33
Transmission lines	22	7.33
Farms/farmlands	102	34.00
Water bodies	08	2.67
Total	300	100.00

Field survey, 2026

7.3 The Effects of Deforestation on the Landscape in Ekpoma

Table 3 shows the effects of deforestation on the landscape of Ekpoma and they are: flooding, emergence of gullies, soil erosion, soil nutrient loss, increased temperature/heat, deterioration of infrastructure, increased cost of maintenance, loss of rare species of plants and animals, carbon loss, health problems, forced migration and recession of rivers/streams. It further shows the opinions of the respondents on the subject matter in the study area. Flooding recorded 46 (15.33), emergence of gullies recorded 42 (14.00%) respondents, soil erosion recorded 36(12.00%) respondents, soil nutrient loss recorded 34 (11.33%) respondents, increased temperature/heat recorded 30 (10.00%) respondents, deterioration of infrastructure recorded 26 (8.67%) respondents, increased cost of maintenance recorded 22 (7.33%) respondents, loss of rare species of plants and animals recorded 18 (6.00%) respondents, carbon loss recorded 14 (4.67%) respondents, health problems recorded 14 (4.67%) respondents, forced migration recorded 12 (4.00%) respondents, and recession of rivers/streams recorded 6 (2.00%) respondents out of the sample population in the study area, This result further reveals that flooding, emergence of gullies, soil erosion, soil nutrient loss, increased temperature/heat, deterioration of infrastructure, and increased cost of maintenance

(in that order) are the most marked effects of deforestation on the landscape of Ekpoma. This result is in agreement with the earlier findings of Adavbiele *et al*., (2006), Aziegbe, (2006), and Umotong, (2021), that deforestation removes the soil-binding function of tree roots, making the lateritic subsoil highly susceptible to surface runoff, which rapidly carves out and expands deep gullies that undercut and swallow buildings, roads, and utilities. They added that the high runoff from deforested areas, combined with the impermeable laterite and inadequate urban drainage, leads to seasonal flash flooding and accelerated degradation of infrastructure.

Table 3: The effects of deforestation on the landscape in Ekpoma

The Effects of Deforestation on the Landscape in Ekpoma	Frequency	Percentage (%)
Soil erosion	36	12.00
Soil nutrient loss	34	11.33
Emergence of gullies	42	14.00
Increased temperature/heat	30	10.00
Deterioration of infrastructure	26	8.67
Recession of rivers /streams	06	2.00
Flooding	46	15.33
Increased cost of maintenance	22	7.33
Loss of rare plants and animals species	18	6.00
Carbon loss	14	4.67
Forced migration	12	4.00
Health problems	14	4.67
Total	300	100

Field Survey, 2026

7.4 The Adaptation, Coping and Intervention Strategies Adopted to Alleviate the Effects of Deforestation on the Landscape in Ekpoma.

The coping/intervention strategies adopted in Ekpoma to alleviate the effects of deforestation on the landscape in Ekpoma are effective, efficient, and regular creation and promotion of community awareness, green infrastructure, planting cover crops, planting all-season green tropical tree crops, practicing soil conservation, reafforestation, the implementation of green building initiatives, controlled lumbering, prohibition of laws against bush burning, controlled use of wood as fuel, planting of growing and fast regenerating trees, enforcement of environmental regulation, adoption of environmental building codes, and construction of gutters.

8.0 Conclusion

Deforestation, which is the large-scale removal of forest cover, has emerged as a critical environmental concern in Nigeria, particularly in rapidly urbanizing areas like Ekpoma. Deforestation is driven by population growth, agricultural expansion, and infrastructural development, and it alters the natural landscape and disrupts ecological balance. Without any iota of doubt, deforestation is expanding daily and the effects are catastrophic. In order that the effects of deforestation on the landscape of Ekpoma, Edo State, Nigeria are completely checked or alleviated, various adaptation, coping and intervention strategies which include effective, efficient, and regular creation and promotion of community awareness, green infrastructure, planting of cover crops, planting all-season green tropical tree crops, practicing soil conservation, reafforestation, the implementation of green building initiatives, controlled lumbering, prohibition of laws against bush burning, controlled use of wood as fuel, planting of fast growing and regenerating trees, enforcement of environmental regulation, adoption of environmental building codes, and construction of drainage channels.

9.0 Recommendations

This paper investigates the effects of deforestation on the landscape of Ekpoma, Edo State, Nigeria. Based on the findings of this paper, the following actionable policy recommendations are made: effective, efficient and regular creation and promotion of community awareness, green infrastructure, planting of cover crops, planting all-season green tropical tree crops, practicing soil conservation, reafforestation, the implementation of green building initiatives, controlled lumbering, prohibition of laws against bush burning, controlled use of wood as fuel, planting of fast growing and regenerating trees, enforcement of environmental regulation, adoption of environmental building codes, and construction of drainage channels.

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