

**EFFECT OF FOREST DEGRADATION ON THE
LIVELIHOOD OF UHUNMWONDE LOCAL
GOVERNMENT AREA OF EDO STATE, NIGERIA**

BY

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**DEPARTMENT OF FOREST RESOURCES AND
WILDLIFE MANAGEMENT
FACULTY OF AGRICULTURE
UNIVERSITY OF BENIN
BENIN CITY**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF
FOREST RESOURCES AND WILDLIFE MANAGEMENT,
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CERTIFICATION

This is to certify that this work was carried out by Christiana Eshiofuneh JAMES, of the Department of forest resources and wildlife management, Faculty of Agriculture, University of Benin city, Edo state, Nigeria.

PROF. C.P. KALU
(Project supervisor)

Date

DR (Mrs) OSADOLOR
Head of Department

Date

DEDICATION

This project is dedicated to God Almighty for his grace and mercy throughout the period of my academic journey. Also to my beloved parents for their consistent support, prayers and guidance.

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First and foremost, I want to thank God Almighty for his steadfast love, mercy, and kindness upon me, for giving me the strength, endurance and good health to accomplish my study and.

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ABSTRACT

The study examined the impact of forest degradation on rural livelihoods in Uhumwonde Local Government Area, Edo State, Nigeria, with specific attention to the economic implications of declining forest resources and the adaptive responses of forest-dependent households. The objectives were to; determine the average household income derived from non-timber forest products (NTFPs) between 2000 and 2025; assess trends in forest resource supply and availability; identify major causes of forest degradation, and evaluate its impacts on livelihood activities and coping strategies among forest-adjacent communities. Primary data were collected using a structured questionnaire administered to 200 respondents across ten purposively selected villages surrounding the Ehor Forest Reserve. Data were analyzed using descriptive statistics, t-tests, and Analysis of Variance (ANOVA) to identify patterns of change in income, resource availability, and degradation intensity over time.

The findings revealed a progressive increase in household income from NTFPs between 2000 and 2025, suggesting that forest-based economic activities have remained central to rural livelihoods despite increasing environmental pressure. ANOVA results showed a statistically significant variation ($F = 2118.295$; $p < 0.05$) in mean annual income across the study years, indicating shifts in forest resource dependence and commercialization. However, evidence of declining forest resource supply was observed, with only 8.5% of respondents reporting abundant forest products after 2020 compared to over 79% in the early 2000s. The study identified illegal logging (98.5%), increased community use (87.5%), and weak enforcement of forest laws (69.5%) as primary drivers of degradation. Furthermore, the availability of trees (99%), firewood (98%), and medicinal plants (93%) showed severe depletion, reflecting a substantial loss of ecological assets. Nearly all respondents (97%) confirmed a regular increase in forest degradation, while environmental problems (65%) and health-related challenges (22.5%) were identified as major consequences.

To mitigate these effects, respondents reported adapting through small-scale farming (78%), craftsmanship (25.5%), and casual labour (8.5%) as alternative income sources.

The study concludes that while forest resources continue to sustain rural economies, unsustainable exploitation patterns threaten long-term livelihood security and ecosystem stability. It recommends stronger enforcement of forestry regulations, promotion of community-based forest management, diversification of rural income sources through sustainable NTFP enterprises, and investment in reforestation and environmental education programmes. These interventions are essential to balance livelihood sustenance with ecological conservation in Uhumwonde and similar forest-dependent communities.

CHAPTER ONE

1.0

INTRODUCTION

Forest is a cornerstone of rural livelihoods, especially in developing regions where a significant portion of the population depends directly on forest resources for their daily needs and survival (FAO, 2020). Aside environmental benefits, forests serves as vital sources of income and revenue for rural households through activities such as the collection and sale of non-timber forest products (NTFPs), small-scale logging, ecotourism, and traditional medicine. However, forest degradation such as the gradual decline in forest health and productivity due to unsustainable logging, agricultural expansion, mining, and climate change (Hosonuma *et al.*, 2012) the income-generating opportunities includes products such as firewood, charcoal, wild fruits, nuts, herbs, medicinal plants, and bushmeat. With fewer products to harvest and lower yields from degraded lands, families experience a direct drop in revenue. This situation is particularly harsh for women and indigenous groups, who are more dependent on forest-based income with limited alternative employment opportunities (Colfer, 2013). Furthermore, the decline in forest cover and biodiversity reduces opportunities for sustainable forest-based enterprises such as beekeeping, resin tapping, and ecotourism. Degraded forests are less attractive for visitors and investors, resulting in reduced tourism-related revenue (Kiss, 2004). In regions where community forestry initiatives or carbon credit schemes exist, degradation also undermines these programmes, leading to lost financial benefits that could have supported local development. (Agrawal *et al.*, 2011) The economic impact of forest degradation extends beyond lost products, it creates a ripple effect by increasing poverty, reducing resilience to economic shocks, and forcing rural populations

to seek low-paying, often exploitative labor in urban areas (Chomitz *et al.*, 2007). This disruption to income and local economies highlights the urgent need for sustainable forest management practices that can preserve the economic value of forests while supporting rural livelihoods. This study focuses on examining the impact of forest degradation on the livelihood of rural communities with specific emphasis on how it affects income generation and revenue derived from forest resources.

1.1 Statement of the Problem

Forest degradation poses a significant threat to the livelihood of rural communities that depend heavily on forest resources for their income and sustenance. As forests are depleted through unsustainable logging, agricultural expansion, mining, and other anthropogenic activities, rural households experience a drastic reduction in the availability of essential resources such as firewood, medicinal plants, non-timber forest products, and game. This degradation undermines traditional revenue-generating activities like charcoal production, honey harvesting, and eco-tourism, leading to decreased household incomes and economic instability. In many cases, communities are forced to low-paying or unsustainable alternatives, thereby perpetuating poverty and increasing their vulnerability to environmental and economic shocks. The long-term consequences of forest degradation not only compromise rural livelihoods but also hinder local development efforts and widen socio-economic disparities or dual society.

1.2 Justification of the Study

Forest plays a vital role in the socio-economic well-being of rural communities, particularly in developing regions where a significant portion of the population relies directly on forest resources for food, fuel, income, and employment (FAO, 2020; Angelsen *et al.*, 2014). However, increasing rates of forest degradation threaten these essential services, leading to adverse impacts on the livelihoods of forest-dependent communities. Despite the growing concern, there is still a limited understanding of the direct and indirect economic consequences of forest degradation on rural households, especially in terms of income loss and diminished revenue-generating opportunities. Therefore it is crucial to provide empirical evidence on the relationship between forest degradation and rural livelihoods. By highlighting the economic implications of forest loss, the research can inform policymakers, environmental planners, and development agencies on the need to prioritize sustainable forest management (Agrawal *et al.*, 2011).

1.3 Objectives of Study

The main objective of this study is to study the effect of forest degradation on the livelihood of Uhumwonde Local government area of Edo state.

The specific objectives are to;

- (i) evaluate income from NTFPS from year 2000-date.
- (ii) assess supply trends of forest resources from 2000-date.
- (iii) assess opportunity of forest degradation
- (iv) determine impact of degradation on forest opportunities.
- (v) assess impact of forest degradation on rural livelihood.

1.4 Scope of Study

The scope is limited to communities that depend heavily on forests for economic activities such as the harvesting and sale of non-timber forest products (NTFPs), fuelwood collection, small-scale logging, ecotourism, and other forest-based enterprises. The study will explore how declining forest quality and resource availability influence household income levels, market participation, and overall economic resilience in rural areas. It will also assess the gendered and socio-economic dimensions of forest-based income loss, recognizing the varying degrees of dependence among different groups within the community. Attention will be paid on selected rural regions where forest dependence is high and degradation is evident. Consideration will be given to both current and past conditions as well as its trends over the past decade, to understand long-term patterns and emerging risks. Thus the research will concentrate on identifying the key economic consequences of forest decline and offering insights on how sustainable forest management could help safeguard rural livelihoods and income sources.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Forest Degradation

The world has a total forest area of 4.06 billion ha, which is 31% of the total land area. The largest part is in the tropics, followed by the boreal, temperate and sub-tropical climatic domains. This area is inhabited a density of about to 0.52 ha per person, although forests are not distributed equally among the world's peoples or geographically. The top ten major countries in descending order are Russia, Brazil, Canada, USA, China, Congo, Australia, Indonesia, Peru, and India. Ninety-three percent (3.75 billion ha) of the forest area worldwide is composed of naturally regenerating forests and 7% (290 million ha) are planted. The area of naturally regenerating forests has decreased since 1990, but the area of planted forests has increased by 123 million ha (FAO 2020a, b).

Forest degradation is defined as the forest ecosystem, which, owing to natural processes or human activity, is no longer able to properly sustain an economic function or the original natural ecological function or the loss of the productive capacity of the forest to sustain life. It can also be defined as the temporary or permanent decline in the productive capacity of land or its potential for environmental management. Degradation is a process of change over time. Degradation caused by overcultivation, overgrazing, deforestation, and inefficient irrigation affects most of the world's dry land (Chakravarty *et al.* 2012; Panwar *et al.* 2022).

The global population is projected to increase from 8.1 billion people in 2024 to 9.7 billion people in 2050, and the annual global consumption of natural resources such as biomass, fossil fuels, metals, and minerals could more than double by 2060 raising the

prospect of further environmental damage caused by increased production, consumption, and waste generation. The FAO Global Forest Resources Assessment (FRA) 2020 estimated that 420 million ha of forest was deforested (converted to other land uses) between 1990 and 2020; although the rate declined over the period, deforestation was still estimated at ten million ha per year in the period 2015–2020.

The forest sector accounts for about 1% of global employment and income generated by the forest. Globally, more than 19.2 million people were estimated to have been directly employed in the proper forest sector in 2015, with the four major subsectors (forestry and logging, timber products, pulp and paper industry, and furniture manufacturing) contributing approximately similar numbers of jobs (Li *et al.* 2022). The estimated collective direct contribution of the formal and informal forest sector to employment in 2017–2019 was 33.3 million jobs (Lippe *et al.* 2022). An estimated 3.2 million women were employed, which was 23% of total forest sector-related employment in 68 countries for which data were available for the period 2017–2019. Fewer women than men are employed in the forest sector in most countries, with a participation rate of 4–49% of the total forest sector employment (Lippe *et al.* 2022). About 2.6 billion people depended on traditional fuels such as wood, charcoal, and agricultural residues for household cooking in 2019; biomass and charcoal combined accounted for about 88% of the traditional cooking fuels used in low- and middle-income countries in that year (Tzamtzis *et al.* 2019). Almost 3.5 billion people use non-timber forest products (NTFPs) and 60–90% of internationally traded medicinal plant species are wild collected (Jenkins *et al.* 2018). Forest wildlife plays an important role in food security. The consumption of wild meat is estimated at five million tonnes per year in the Congo Basin and 1.3 million tonnes in the

Amazon Basin (Nasi *et al.* 2011). Owing to climate change, losses equivalent to at least 5% of global GDP each year and the possibility of 10–40% loss in crop production in India are anticipated owing to floods and droughts. Population pressure, agricultural expansion/intensification, deforestation, and development of infrastructure have been the major threats to biodiversity and climate (Baboo *et al.* 2017). The monitoring of forest degradation, including outbreaks of insect pests and disease, is at an early stage globally. It is also difficult to quantify the economic cost of damage, which encompasses timber losses, the cost of tree replacement, and impacts on ecosystem services and socioeconomic outcomes for local communities (FAO 2023). It is estimated that 5.8 billion people use NTFPs worldwide, including 2.77 billion rural people (Shackleton and De Vos 2022).

Almost 50% of the global population use wild collected species (the total number of species used is estimated at 50,000) and 70% of the world's people depend on wild species for food, fowers, fibers, fosses, medicine, energy, income, other minor forest products, and other purposes (IPBES 2022). Almost 75% of the world's total land use area, mainly forests, rangelands and wetlands, has been negatively affected by degradation and transformation and will increase to more than 90% within 30 years (Garnett *et al.* 2018). The annual economic loss linked to ecosystem degradation is estimated at US\$ 4.3–20.2 trillion and has a negative impact on 3.2 billion people worldwide (IPBES 2018).

2.2 Deforestation and Consequences

A forest is an ecosystem composed primarily of trees and other woody vegetation. The Food and Agriculture Organization (FAO) offers a more complete definition.

FAO (2010) defines a forest as land covering more than 0.5 hectares with trees taller than 5 meters and a canopy cover of more than 10% or trees capable of reaching these naturally uninterrupted and unbroken thresholds. Bofo (2013) notes that forest resources significantly influence household food security and income creation in Ghana.

Approximately 2.5 million people in the country rely on forestry products for income and sustenance. It is widely recognized that Ghana's socioeconomic development is closely tied to forests and forest products, particularly in rural areas. A study conducted in three forest regions by Appiah *et al.* (2009) highlighted that household income from forest products contributes around 38% more than other sources.

Even though forest products support livelihoods in Ghana, there is still enormous deforestation. The International Tropical Timber Organization (ITTO, 2005) estimates that Ghana's significant forest cover could vanish entirely in 25 years due to the country's yearly rate of deforestation, which is approximately 65,000 hectares. However, there have been some forest restoration projects like the REDD+ and the Forest Replacement Association (FRA). This dire forecast explains why deforestation is currently not just a major national issue but also a threat to the livelihood of communities that depend on forests. These people, primarily rural populations, heavily depend on forest resources for their basic livelihoods.

This makes them specifically susceptible to the negative consequences of deforestation, such as reduced income, food insecurity, and displacement (Wunder, 2001). Deforestation, a multifaceted phenomenon with far-reaching environmental, social, and economic repercussions, has emerged as a critical global issue. Deforestation can provide immediate financial benefits by extracting timber, expanding agriculture, and developing

infrastructure. However, these advantages frequently come at the cost of long-term sustainability and resilience challenges (Nepstad *et al.*, 2006). To understand the social aspects of land degradation, it is important to examine how communities interact with and rely on land resources for their well-being and livelihoods. aspects of deforestation, one must analyze the complex network of individuals and groups, the distribution of power, and the organizations responsible for forest governance and resource management.

2.4 Socio-Economic Benefits of Deforestation

Socioeconomic benefits of deforestation can be a complex issue with both positive and negative implications. While deforestation can lead to short-term economic gains through logging, agriculture, and infrastructure development, the long-term socio-economic impacts can be detrimental. Deforestation can result in the loss of ecosystem services such as clean water, climate regulation, and biodiversity, essential for human well-being and economic activities (Naidoo *et al.*, 2008). The financial benefits of deforestation, such as timber production and agricultural land conversion, need to be carefully weighed against the long-term socio-economic costs associated with environmental degradation and loss of ecosystem services (Kpare, 2016). Studies have shown that socio-economic factors play a significant role in driving deforestation. For example, population growth, poverty reduction, national income, economic growth, and foreign debt have been identified as crucial macroeconomic factors influencing deforestation rates (Dezécache *et al.*, 2017).

Additionally, local and national socio-economic factors can influence deforestation patterns, highlighting the interconnectedness between economic activities and environmental outcomes (Phompila *et al.*, 2017). The pressure to convert forests into land

for food production to support growing populations and provide socioeconomic benefits has been a significant driver of deforestation in many regions (Asrat *et al.*, 2018; Boafo, 2013).

Furthermore, the socio-economic consequences of deforestation extend beyond environmental degradation. It is crucial to consider the socio-economic implications of deforestation, as it highlights the need for a holistic approach to environmental issues. Areas undergoing active deforestation often exhibit lower socio-economic indicators, indicating a precarious socio-economic situation in these regions (Tritsch and Arvor, 2016). As stated by the UNEP, sustainable livelihoods guarantee that people possess and are entitled to a range of essential resources and opportunities that contribute to their overall welfare. This is of utmost importance for Indigenous individuals, especially those residing in villages near forests, because they tend to lack the essential resources necessary to maintain a satisfactory standard of living, such as a sufficient amount of nourishing food, appropriate housing, healthcare accessibility, energy sources, safe drinking water, education, and a pollution-free environment. This is because, when the trees are cut down, the resulting products provide a source of revenue for traditional leaders, local government, and the entire nation. The revenue is from royalties, personal income, taxes, and export revenues from individuals exploiting forest products. While deforestation may offer short-term economic benefits, the long-term socio-economic costs can be substantial. It is essential to consider the socio-economic implications of deforestation and adopt sustainable land management practices that preserve ecosystem services and support long-term economic development.

2.5 Cause of Forest Degradation

Forest degradation entails a reduction or loss of the biological or economic productivity and complexity of forest ecosystems resulting in the reduced overall supply of benefits from forests, such as wood or biodiversity. Human activities that drive forest degradation may include:

- Overgrazing
- Habitat destruction
- Introducing invasive species
- Excessive logging
- Excessive collection of minor forest products
- Demand for fuel wood and charcoal
- Shifting cultivation
- Human-induced forest fires
- Irresponsible use of forests and forest littering
- Indirect effects of human activities such as climate change

Forest degradation is hard to quantify but is likely increasing human activities, different climatic events, forest fires, pests, diseases, and other environmental disturbances, which may degrade forests and thereby reduce forest goods and services, biodiversity, aesthetic values, productivity, and forest health. Forest degradation may also negatively affect other changes of land use (e.g., by causing a loss of downstream water quality and affecting groundwater recharge) and cause the emission of greenhouse gases (GHGs). Human-induced land degradation and desertification, water scarcity, and climate change are increasing the levels of risk for agricultural production and ecosystem services. Converging evidence indicates that, as agriculture intensifies, it increases the severity of

land degradation which makes the area susceptible to of soil erosion, nutrient depletion, and salinization (FAO 2021). FAO and FRA (2020) reported that 58 countries representing almost 38% of the global forest area reported that they monitored the area under degraded forest.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Area

This study was carried out in Uhumwonde Local Government Area (LGA) of Edo State, situated in the southern region of Nigeria. Uhumwonde is located between latitude 6°30'N and 7°00'N and longitude 5°45'E and 6°15'E. It is bordered to the south by Orhionmwon LGA, to the east by Esan West and Esan Central LGAs, and to the west by Ovia North-East LGA. The administrative headquarters is located in Ehor, which also hosts the Ehor Forest Reserve, a significant ecological site recognized for its biodiversity and forest resources. According to NPC, (2006), Uhumwonde LGA has an estimated population of 121,749, comprising 63,727 males and 58,022 females, distributed across approximately 235 villages. The population is predominantly rural and depends heavily on the exploitation of natural resources for their livelihoods. Major income generation activities include farming, hunting, fuelwood collection, and the harvesting of non-timber forest products (NTFPs). The climate condition is marked with wet and dry seasons, with a rainfall pattern that varies from 1,500mm-2000mm per annum. The wet season occurs between March and October with a peak rainfall occurring between May-July and in September. The dry season ranges from November to February. The temperature averages about 25°C in the rainy season and about 32°C in the dry season. The climate is humid tropical.

3.2 Sampling Method

The study employed a purposive sampling technique to select villages adjoining the forest reserve. Uhumwonde Local Government Area comprises of 235 villages with a

total projected population of 121,749 (National Population Commission, 2009). There are a total number of 58 villages around the forest reserve. Using a sampling intensity of 18%, a total number of 10 villages adjoining the forest reserve were selected (Table 3.1). The total population in the selected villages that stood as 14,602 were subjected to 2% sampling intensity accounting for 248 copies of questionnaire, thus 248 copies of questionnaire were administered to elicit information on the income of NTFPs and also assess the impact of forest degradation on rural livelihood

Table 3.1: Number of Respondents in Selected Villages

VILLAGES	POPULATION	2% S.I	NR
Ehor	7191	144	127
Ekudo	200	4	4
Iriwe	283	6	2
Idunmwungha	1060	21	20
Irhue	786	16	10
Ugbiyaya	665	13	6
Obazagbon	476	10	10
Egbisi	204	4	4
Okemuen	592	12	7
Ayen	876	18	10
Total	14,602	248	200

S.I = Sampling Intensity NR= Number of Respondent

3.3 Data Collection

Primary data sources will be utilized for this study. Primary data will be collected through the administration of a structured questionnaire to sampled households in the selected communities. The questionnaire is designed to elicit detailed information on the income from NTFPs, determine revenue from the forest and also assess the impact of

forest degradation on rural livelihood. The administration of questionnaires were facilitated with the assistance of local interpreters proficient in indigenous languages such as Bini and Esan, to ensure effective communication and accurate responses.

3.4 Data Analysis

Data collected from the respondent in the communities was analyzed using descriptive statistics (i.e frequency and percentage) and Analysis of Variance (ANOVA).

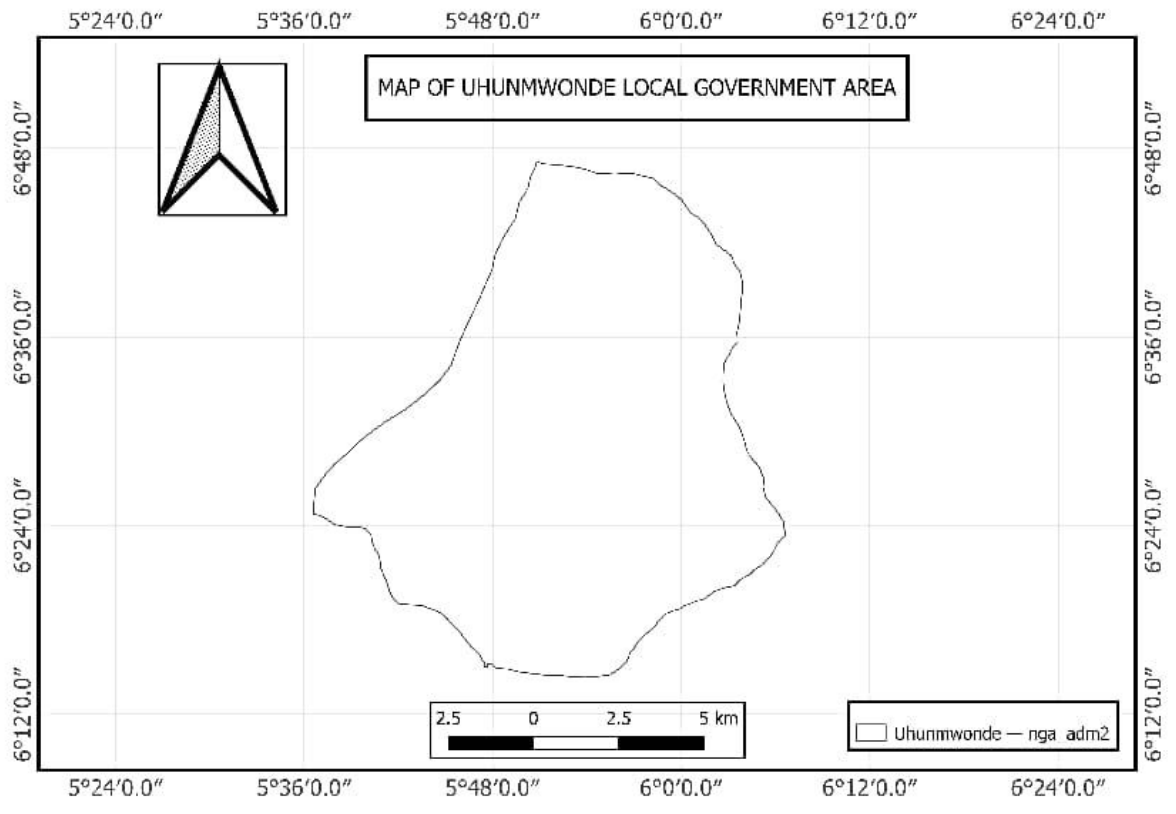


Figure 1: Map of Uhumwonde Local Government Area



Plate 1: Administration of questionnaire

CHAPTER FOUR

RESULTS AND DISCUSSION

Table 4.1 reveals a consistent upward trend, indicating increasing dependence on forest resources for livelihood. Incomes rose significantly from about ₦21,547–₦35,500 in 2000–2003 to above ₦38,000–₦40,000 by 2021–2025. The most notable growth occurred between 2008 and 2015, when several communities (Egbisi, Iriwe, Okemuen, and Ekudo) recorded peak incomes of ₦40,000, reflecting intensified forest resource commercialization likely driven by higher demand for energy, herbal products, and other forest goods. However, after 2015, incomes stabilized in most communities, suggesting that while exploitation of NTFPs persisted, the economic benefits had reached a saturation point due to resource depletion and declining forest productivity. The ANOVA result ($F = 2118.295$; $p < 0.05$) confirms that income variations across years were statistically significant, showing dynamic changes in forest-based livelihoods over time.

Table 1: Average annual income from NTFPs collection (₦)

Location	2000-2003	2004-2007	2008-2011	2012-2015	2016-2020	2021-2025
Ehor	21,547	25,265	26,051	35,855	37,152	34,920
Ayen	27,500	29,500	36,850	29,500	40,000	40,000
Irhue	25,500	33,500	35,500	39,100	40,000	40,000
Egbisi	30,500	35,500	37,750	40,000	40,000	40,000
Okemuen	34,071	35,500	38,714	40,000	40,000	40,000
Iriwe	30,500	35,500	37,750	40,000	40,000	40,000
Ekudo	35,500	35,500	40,000	40,000	40,000	40,000
Obazagbon	35,500	25,450	36,850	40,000	40,000	40,000
Idumwungha	25,375	30,500	35,725	38,875	38,525	38,525
Ugbiyaya	27,500	36,400	31,300	40,000	40,000	40,000
Mean	29,849 ^d	32,212 ^c	35,849 ^b	39,233 ^a	39,768 ^a	39,945 ^a

These findings imply that forest products continue to serve as vital livelihood buffers for rural households amid agricultural decline and limited alternatives. Yet, the observed income stabilization highlights emerging sustainability concerns, as overharvesting and forest degradation threaten long-term resource availability. This pattern aligns with regional studies (Alemu and Tolossa, 2022; Baffour-Ata *et al.*, 2021; Iwuji *et al.*, 2022) showing that while NTFPs alleviate short-term poverty, unregulated exploitation can undermine ecosystem resilience and future rural welfare.

Table 2: Percentage of Total Household Income from Non-Timber Forest Products (NTFPs) (%)

	20%	20-50%	60-80%	80-100%
2000-2003	2	0.1	0.75	21.6
2004-2007	0.38	0.5	16.8	1.3
2008-2011	0.25	0.3	5.8	0.5
2012-2015	0.25	7.6	0.5	0.4
2016-2019	3.4	15.3	0.5	0.3
2020-2025	18.8	1.6	0.75	1

Source: Field survey, 2025

Table 4.2 indicate steady decline in household dependence on Non-Timber Forest Products (NTFPs) in Uhumwonde LGA from 2000 to 2025. Between 2000 and 2003, most households (21.6%) derived over 80% of their income from NTFPs, reflecting high forest reliance. By 2004–2007, this dropped sharply, with 16.8% earning 60–80% from NTFPs, showing gradual income diversification. Dependence further declined between 2008 and 2015 as forest productivity and access reduced. A temporary rise occurred in 2016–2019, when 15.3% of respondents earned 20–50% from NTFPs, possibly due to poor farm yields. However, by 2020–2025, 18.8% earned less

than 20% from NTFPs, indicating severe forest degradation and loss of forest-based income sources. Overall, the results reflect diminishing forest capacity to support livelihoods, consistent with findings from Makafui-Sam (2024), Iwuji *et al.* (2022), and FAO (2023).

Findings in Table 4.3 reveal a sharp decline in major forest resources within Uhumwonde Local Government Area. The reason to a large extent depends on the availability of forest resources especially Non-timber forest products (UNEP, 2021).

Table 3: Changes in availability of forest resources (%)

	Frequency	Percent
Timber	198	27.2
Fuelwood	196	30.0
Medicinal plant	186	25.6
Wild fruits	147	20.2
Total	727	100

Source: Field survey. 2025

The severe decline in timber and fuelwood reflects high household dependence on forest biomass for energy and construction, while the scarcity of medicinal plants signals a threat to traditional healthcare systems. Similar patterns of forest depletion have been observed across West Africa (FAO, 2023; Appiah, 2024; Makafui-Sam, 2024). The loss of medicinal plant, as noted by Adom (2017) and Agrawal and Redford (2009), also erodes indigenous knowledge and weakens community resilience.

Table 4: Decreased in quantity of forest resources supply (%)

	<20	20-50	60-80	>80
2000-2003	2.1	0.1	0.6	0.8
2004-2007	19.9	0.3	0.8	0.1
2008-2011	0.5	2.4	0.5	0.5
2012-2015	0.3	19.1	0.4	0.1
2016-2019	0.3	2	13	0.8
2020-2025	2	1.1	9.8	22.8

Source: Field survey, 2025

Table 4.4 indicates a steady decline in forest resource supply in Uhumwonde LGA from 2000 to 2025. The early 2000 to 2003 period recorded minimal reduction (<20%), marking the onset of resource depletion. A sharp rise occurred between 2004-2007, with 19.9% of respondents reporting over 20% reduction, reflecting intensified logging and land conversion. Declines fluctuated between 2008 and 2015, but worsened thereafter, peaking between 2020-2025 when 22.8% reported over 80% reduction.

Table 4.5 identifies the factors contributing to forest degradation in Uhumwonde Local Government Area. Illegal logging (36.1%) emerged as the most significant cause, followed by weak enforcement of forest laws (9.9%), while illegal grazing and fuelwood collection accounted for 9.9 and 3.4% respectively.

Factors	Freq	Percent
Weak forest enforcement	139	36.1
Illegal grazing	38	9.9
Illegal logging	195	50.6
Fuel wood collection	13	3.4

Table 5: Factors that give rise to forest degradation

Source: Field survey

This pattern indicates that human-induced activities and poor institutional control are the dominant drivers of forest loss in the area. The overwhelming role of illegal logging reflects widespread unregulated timber extraction and inadequate monitoring, consistent with findings by Appiah (2024) and FAO (2023). Weak law enforcement further amplifies degradation, as noted by Adom (2017) and Baffour-Ata *et al.* (2021), who linked ineffective governance and limited funding to persistent forest exploitation. Although illegal grazing and fuelwood collection appear less prominent, their cumulative effects such as soil degradation and vegetation loss remain ecologically significant (Alemu & Tolossa, 2022; Amissah *et al.*, 2020)

Table 4.6 shows that small-scale farming (41.6%) and daily related labour was the (35.7%) are the main ways people in Uhumwonde cope with forest degradation. Others engage in craftsmanship (13.6%), labour migration (4.5%), and alternative income sources (4.5%).

Measures	Freq	Percentage
Piece rate	134	35.7
Craftmanship	51	13.6
Labor migration	17	4.5
Small scale farming	156	41.6
No alternative income source	17	4.5

Table 6: Opportunities of forest degradation

Source: field survey, 2025

These findings suggest that most households adapt by shifting to farming and casual labour to sustain their income while reducing pressure on forest resources. Craftmanship provides an alternative livelihood, though few have access to other job options. Overall, the results reflect efforts toward livelihood diversification in response to declining forest resources.

4.7 Impact of Degradation on Forest benefits in Communities

Figures 1–4 show that forest degradation has greatly affected key community benefits such as employment, farming, cultural activities, and climate regulation. In Ehor and Idumungha, where forest dependence was highest, employment and farming increased between 2006 and 2010 but declined sharply afterwards.

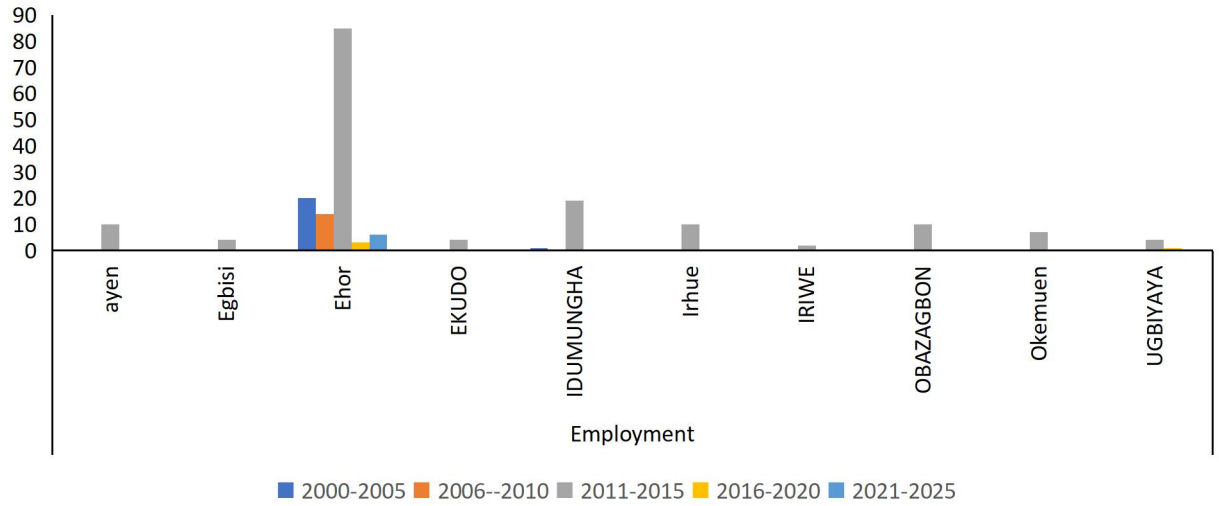


Figure 2: Impact of degradation on employment in communities

This decline reflects how forest depletion reduces livelihood opportunities and disrupts cultural life such as employment (Appiah *et al.*, 2009; Asare *et al.*, 2013).

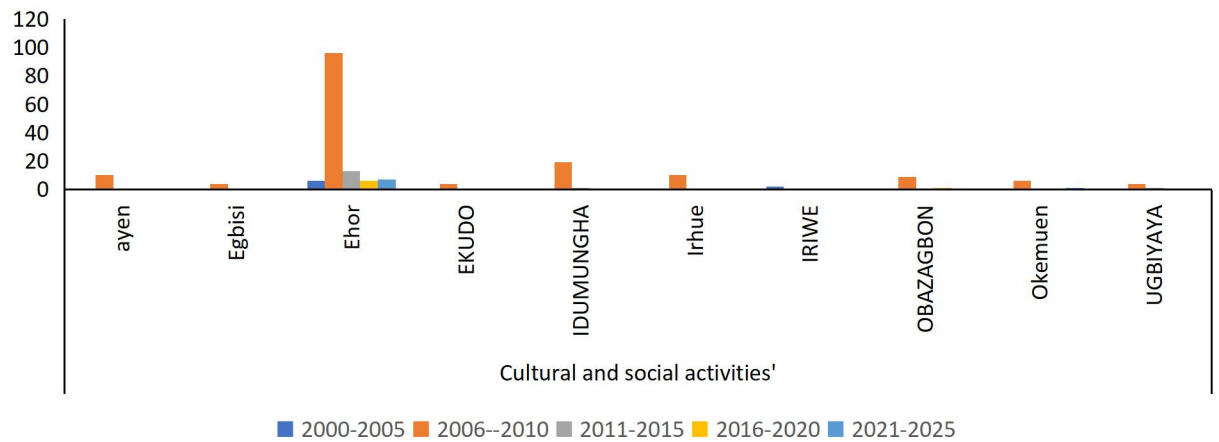


Figure 3: Impact of degradation on cultural and social activities in communities

This decline reflects how forest depletion reduces livelihood opportunities and disrupts cultural life (Appiah *et al.*, 2009; Asare *et al.*, 2013).

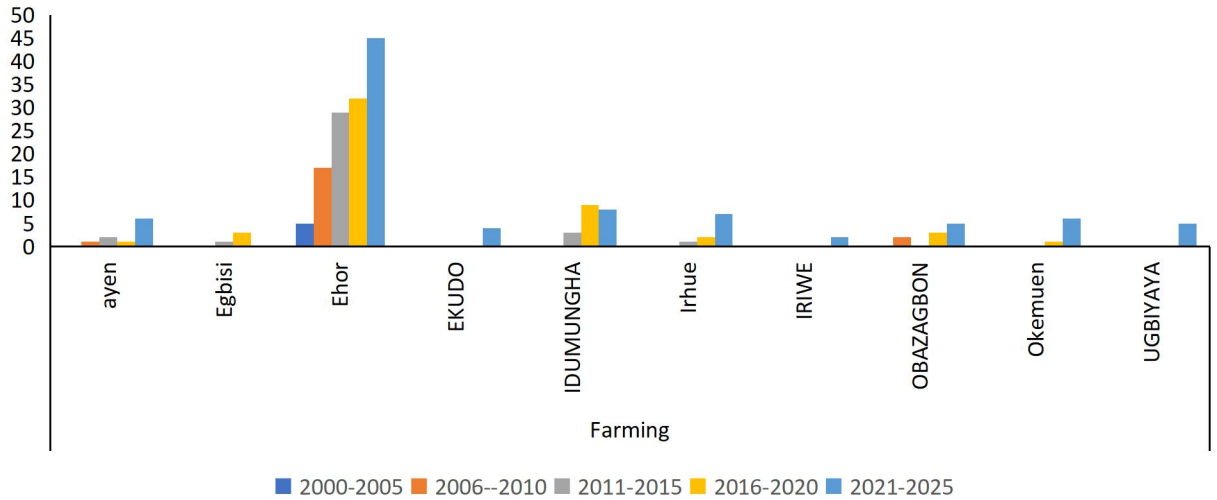


Figure 4: Impact of degradation on farming in communities

This decline reflects how forest depletion reduces livelihood opportunities and disrupts cultural life such as farming (Appiah *et al.*, 2009; Asare *et al.*, 2013).

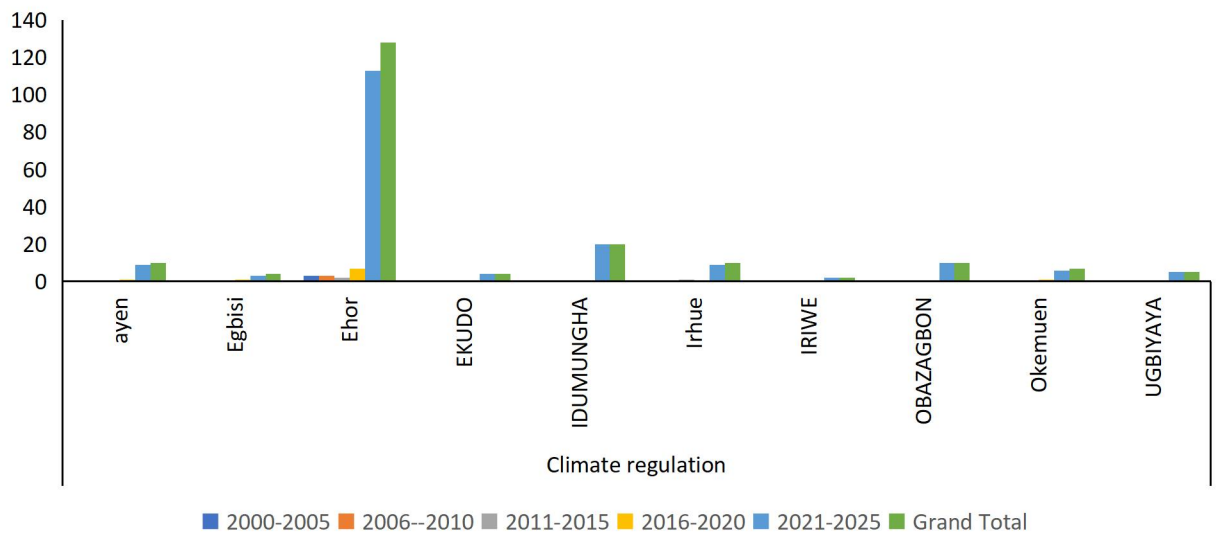


Figure 5: Impact of degradation on climate regulations in communities

This decline reflects how forest depletion reduces livelihood opportunities and disrupts cultural life (Appiah *et al.*, 2009; Asare *et al.*, 2013). The loss of forest cover also

weakens climate regulation, leading to increased local temperature fluctuations and reduced carbon storage (Akrofi-Atitianti *et al.*, 2018).

Table 4.7 shows that forest degradation has greatly reduced access to essential forest resources. Between 2000 and 2010, about 75.5% of respondents reported that gathering food, medicine, and other materials was “easy.” However, by 2021–2025, 89.5% described it as “very difficult” or “uncertain.”

Table 7: Challenges encountered in NTFPs Collection.

	Easy		Difficult		Very difficult		Uncertain	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
2000-2005	22	11.0	2	1.0	3	1.5	6	3.0
2006-2010	151	75.5	6	3.0	1	0.5	4	2.0
2011-2015	21	10.5	20	10.0	8	4.0	3	1.5
2016-2020	2	1.0	109	54.5	9	4.5	6	3.0
2021-2025	4	2.0	63	31.5	179	89.5	181	90.5

This sharp decline reflects the loss of forest ecosystem services that support rural livelihoods. Iwuji *et al.* (2022) noted that degradation limits access to forest foods and medicines, heightening vulnerability. Similarly, Appiah *et al.* (2009) observed that deforestation restricts subsistence options, forcing households to seek alternative income sources. These findings highlight the socio-economic hardship caused by ecological decline in Uhumwonde.

Table 8: Impacts on social-cultural activities

Activities	Frequency	Percent
Environmental problems	130	65
Health	45	22.5
Education	20	10
Security	5	2.5

Source: Field Survey, 2025

Table 4.8 shows that environmental problems (65%) are the major impact of forest degradation in Uhunmwonde, followed by health (22.5%), education (10%) and security (2.5%). This indicates that forest loss has led to soil erosion, biodiversity decline, and poor rainfall patterns. Health effects include reduced access to medicinal plants and increased disease risks, while declining income from forest resources affects education and local security. Overall, forest degradation has broad effects on both the environment and community wellbeing.

Table 4.9 shows that 97% of respondents observed forest degradation occurring regularly, while 1% said it happened sometimes and 2% had never observed it. This indicates that forest decline is a persistent and visible problem in Uhunmwonde.

Table 4.9: Observed increase of Forest Degradation

	Frequency	Percent
Regularly	194	97.0
Sometimes	2	1.0
Never	4	2.0

Source: Field survey, 2025

The finding suggests weak forest management and enforcement, consistent with reports by iwuji *et al.* (2022) and Makafui-sam (2024) linking continuous degradation to unsustainable land use and poor policy implementation.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the impact of forest degradation on rural livelihoods in Uhumwonde Local Government Area, Edo State, focusing on income derived from Non-Timber Forest Products (NTFPs), the causes and extent of forest resource decline, and the adaptive responses of forest-dependent households. The findings collectively reveal a complex interaction between socioeconomic dependence, ecological deterioration, and weak forest governance.

The study concludes that forest degradation in Uhumwonde Local Government Area is primarily driven by human activities notably illegal logging, overharvesting of forest products, and weak enforcement of forestry regulations. While NTFPs continue to serve as vital livelihood resources, their increasing commercialization amidst declining forest cover reveals an unsustainable trajectory that threatens both ecological integrity and rural welfare. The findings affirm that forest-dependent households are trapped in a livelihood degradation feedback loop, where poverty-driven resource extraction accelerates environmental decline, which in turn deepens rural poverty.

The persistent observation of degradation across all communities underscores a systemic governance gap in forest management. The lack of viable alternative livelihoods, inadequate community awareness, and ineffective institutional oversight collectively contribute to ongoing forest loss. This condition, if unaddressed, portends significant

environmental and socioeconomic risks including biodiversity depletion, climate variability, and long-term livelihood insecurity.

5.2 Recommendations

Based on the results, the following recommendations were made

1. Government agencies such as the Edo State Ministry of Environment and Forestry Commission intensify surveillance of forest reserves through community forest guards, remote sensing, and periodic monitoring.
2. Establishing community-managed reforestation and afforestation programs. Local stakeholders should be encouraged to cultivate economically valuable tree species such as teak, mahogany, and *Gmelina arborea* to replenish degraded lands.
3. The promotion of alternative livelihood programs such as beekeeping, mushroom cultivation, bamboo crafts, and eco-tourism, which offer sustainable income without exerting pressure on forest resources.
4. The inclusion of environmental education, forest conservation awareness, and climate change adaptation training in local community development programs. This can be achieved through collaboration between educational institutions, agricultural extension services, and local media.

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APPENDIX

EFFECT OF FOREST DEGRADATION ON LIVELIHOODS OF UHUNMWONDE LOCAL GOVERNMENT AREA OF EDO STATE

Dear respondents,

This questionnaire is designed to obtain information on the “effect of forest degradation on livelihoods of uhunmwonde local government area of Edo state. This questionnaire is purely for research. All information supplied will be treated with confidentiality.

Community\ Settlement _____ Ward _____

1. What was your average annual income from NTFPs in the year 2000?

	<10,000	10,000-20,000	21,000-30,000	31,000-40,000	>40,000
2000-2003	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2004-2007	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2008-2011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2012-2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016-2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020-2025	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. What percentage of your total household income currently comes from NTFPs?

	2000-2003	2004-2007	2008-2011	2012-2015	2016-2019
2020-2025					
(a) >20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(b) 20-50%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(c) 60-80%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(d) 80-100%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					

3. How has the quantity of forest resources supply in your area decreased?

	2000-2003	2004-2007	2008-2011	2012-2015	2016-2019
2020-2025					
(a) >20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(b) 20-50%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(c) 60-80%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>					
(d) 80-100%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Which forest resources have you noticed the biggest changes in availability?

	Yes	No
(a) Trees	<input type="checkbox"/>	<input type="checkbox"/>
(b) Firewood	<input type="checkbox"/>	<input type="checkbox"/>

- (c) Medicinal plants
- (d) Wild fruits
- (e) Other (please specify) _____

5. What do you believe are the main causes of changes in forest resource supply since 2000?

- | | Yes | No |
|--|--------------------------|--------------------------|
| (a) Deforestation or illegal logging | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Climate change effects | <input type="checkbox"/> | <input type="checkbox"/> |
| (c) Increased community use | <input type="checkbox"/> | <input type="checkbox"/> |
| (d) Government restrictions or regulations | <input type="checkbox"/> | <input type="checkbox"/> |
| (e) Other (please specify) _____ | | |

6. What are factors that gives rise to forest degradation? (Select all that apply)

- (a) Illegal logging/ harvesting
- (b) Illegal grazing
- (c) Fuelwood collection
- (d) Weak enforcement of forest laws
- (e) Other (please specify) _____

7. How often have you observed new or increased forest degradation activities in your area in the past 10 years?

- (a) Regularly
- (b) Rarely
- (c) Sometimes
- (d) Never

8. How has forest degradation affected your ability to gather food, medicine, or materials from the forest?

- | | 2000-2005 | 2006-2010 | 2011-2015 | 2016-2020 | 2021-2025 |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| (a) Easy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Difficult | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (c) Very difficult | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (d) Not at all | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

9. How does forest degradation affect the following activities in your area?

- | | 2000-2005 | 2006-2010 | 2011-2015 | 2016-2020 | 2021-2025 |
|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| (a) Employment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Cultural and social activities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (c) Farming | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (d) Climate regulation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

10. What do you do to avert forest degradation?

- (a) No alternative income source
- (b) Small-scale farming or gardening
- (c) Casual labor or day jobs
- (d) Craftmanship
- (e) Travelling out of the community
- (f) Other (please specify)_____

11. What are the activities imparted upon by forest degradation?

- (a) Health
- (b) Education
- (c) Security
- (d) Environmental problems