Assessing the Impact of Deforestation on Agricultural Activities and Exploring Management Strategies in Benue South, Nigeria

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Abstract

Deforestation poses a significant threat to agricultural productivity in Nigeria. This study investigates the impact of deforestation on agricultural activities and examines management strategies employed in the region. A mixed-methods approach was used, combining structured questionnaires and key informant interviews (KIIs). Five LGAs were purposively selected, and 729 respondents were selected using the purposive sampling techniques. A subsample of 73 respondents, constituting 10% of the total respondent pool, was purposively selected for in-depth interviews to gather richer and more detailed information. The results show that deforestation has led to reduced crop yields with 56% of the respondents agreed,39% also agreed for loss of soil nutrients, and 39% of the respondents strongly disagreed that disruptions to the climate and water cycle, ultimately decreasing agricultural productivity in the region. The main causes of deforestation identified include fuel wood harvesting, with timber production, and farmland expansion. The study highlights the need for sustainable management strategies, such as sustainable agricultural programs with 15%, improved awareness constitute 27%, and 35% of the respondents hinted provision of alternatives to fuel wood, to mitigate deforestation practices. However, limited awareness and high costs of sustainable practices were identified as obstacles to effective deforestation prevention measures. The findings have important implications for policymakers, agricultural practitioners, and environmental managers seeking to address deforestation challenges and promote sustainable agricultural development in Benue South.

Keywords: agriculture, deforestation, impact, management

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Introduction

Deforestation, defined as the destructive removal of forest vegetation without efforts to mitigate harm, inevitably leads to ecological degradation (Nzeh et al., 2015). This widespread phenomenon poses significant environmental threats, including soil fertility loss, erosion, climate change, flooding, and disruptions to the water cycle, ultimately jeopardizing the physical environment of rural communities worldwide (FAO, 2014). Forests, covering nearly a third of the Earth's land surface, provide numerous environmental benefits, such as regulating the hydrologic cycle, conserving soil, preventing climate change, and preserving biodiversity (Sheram, 2012). Despite the increasing importance of forest cover, many people contend that forests occupy lands that would otherwise be used for human settlement, development, and civilization. Forest cover utilizes land that can otherwise be used to provide settlement for millions of people now that in the world the population is fast rising (Cesareo et al., 2021). Additionally, forests provide food, produce rainfall, and offer a diverse array of goods for medicinal, cultural, and spiritual purposes, ultimately supporting agricultural productivity by improving crop yields and providing fodder for animals (CBD, 2009).

Enhancing agricultural productivity remains a paramount goal for policymakers and researchers, driven by the need to ensure food security for a growing global population (Barrett et al., 2010), as well as to alleviate poverty, foster economic growth, and facilitate structural transformation in developing countries (Bustos et al., 2016). Agricultural production plays a vital role in maintaining food security and promoting long-term economic growth in both developed and developing nations (Yurtkuran, 2021). In Somalia, significant production losses have been recorded, including a 50% decline in sorghum, 34% in corn, 83% in sesame, and 59% in cowpea (World Bank, 2018). Droughts exacerbate these losses by reducing cultivated land and causing harvest failures. The 2017 droughts in Somalia resulted in estimated losses of $71 million for major crops, including $35 million for maize and sorghum, $9

million for cowpea, and $28 million for sesame (World Bank & FAO, 2018).

According to the Food and Agriculture Organization (FAO), the world experienced alarming rates of deforestation in the 1990s, with millions of hectares of natural forests lost annually (FAO, 2014). Moreover, FAO estimates suggest that the tropics lose over 10 million hectares of forest cover every year (FAO, 2011). While deforestation has been practiced for centuries, the mid-1800s marked the beginning of unprecedented forest destruction. In Africa, forests play a vital role in meeting basic needs, with wood fuels accounting for a significant share of primary energy consumption (Amos, 2010). Nigeria boasts an extensive array of forested lands, comprising swamp forests in the southernmost region, tropical rainforests in the southwest and wooded savannahs in the middle belt and northern areas. As one of the countries with the most abundant forest resources globally, Nigeria's forests cover approximately 110,890 km², accounting for about 12.18% of the country's total land area of 910,770 km² (Mfon et al., 2014).

Ecologically, forested areas play a crucial role in maintaining ecosystem balance, storing and purifying drinking water, mitigating natural disasters like droughts and floods, and regulating the climate by storing carbon. In Nigeria, forests have long been a cornerstone of survival, economic development, and environmental sustainability for many communities. The availability and cost of fuel wood, for instance, can impact community nutrition levels, while numerous individuals, including forest and wood workers, rely directly on forests for their livelihood (Aliyu et al., 2014). According to aggregate data, major crops experienced a 25% decline in productivity between 1990 and 2010, with yield levels falling short of those required for global competitiveness in agriculture (Ann, 2013). Unless addressed, deforestation may eradicate the potential benefits of the agricultural sector, including income and employment opportunities, for the majority of Nigerians. Human activities are widely acknowledged as the primary driver of global deforestation.

While deforestation and habitat loss can result from both human and environmental factors, human activities are predominantly responsible (Becek and Odihi 2008). Natural causes, such as floods, droughts, forest fires, overpopulation of animals, and climate change, can also contribute to deforestation. However, human activities, including cattle breeding, timber extraction, charcoal production, mining, urbanization, agricultural expansion, oil extraction, and industrialization, are reported to be the main causes of global deforestation (Bodo and Bodo, 2019).

The sustainable management of forest resources has been a longstanding concern, given its significant impact on biological diversity and crucial role in maintaining global ecological functions (Areola, 1987). To mitigate the effects of deforestation on livelihoods, farming households have developed various adaptation strategies. In response to changing environmental conditions, farming households employ diverse coping mechanisms. Notably, the survival strategies adopted in response to deforestation have fostered environmental awareness and conservation consciousness among local communities (FAO, 2009).

This study aimed to investigate the impact of deforestation on agricultural activities and management strategies in selected local government areas of Benue South. The research objectives include: (1) to assess the impact of deforestation on agricultural productivity, (2) to identify the underlying causes of deforestation, and (3) to examine the effectiveness of existing management strategies in addressing deforestation and its consequences on agriculture.

Study Area

The study focused on the Benue South region, comprising nine Local Government Areas (LGAs), with five LGAs purposely selected for the study: Agatu, Apa, Ador, Otukpo, and Obi LGAs. Notably, Apa LGA is situated in the northwestern part of Benue State, bounded by specific geographic coordinates: Latitude 7°20′ North to 7° 50′ North of the Equator and Longitude 7°

40′ East to 8° 10′ East of the Greenwich Meridian. Its borders are shared with Agatu LGA to the North, Otukpo LGA to the South, Gwer-West LGA to the East, and Olamaboro LGA of Kogi State to the West (Jande and Amonjenu, 2018).

Apa Local Government Area (LGA), with its headquarters in Ugbokpo, comprises 11 council wards and covers a land area of approximately 995 km². As of 2023, the projected population is around 146,138 people (National Population Commission, 2009). Climatically, the region falls within the Koppen's Aw climate group, characterized by distinct wet and dry seasons. The rainy season spans seven months (April-October), with annual rainfall ranging from 1,200-2,000 mm, while the dry season lasts from November to March (Ikpe et al., 2013). Temperatures remain relatively high, averaging 28-32°C and occasionally reaching 37°C.

The vegetation is predominantly guinea savanna, featuring coarse grasses and scattered tree species. Dense forests are scarce, primarily found as gallery forests, village forests, or forest reserves (Terwase and Terese, 2013). Agriculture is the mainstay of the LGA's economy, Sengaging over 70% of the population. The region's strategic location across both the forest zone, suitable for tree crops, and the savanna, ideal for grain cultivation, presents a unique agricultural advantage (Ikpe et al., 2024).

Otukpo LGA in Benue State, Nigeria, is situated between latitude 7° and 7°45′ North and longitude 7°35′ and 8°30′ East. As per the 2006 national census, the LGA has a population of 261,666 persons, comprising 133,347 males and 128,319 females (Federal Government of Nigeria [FGN], 2007). The climate is tropical, with an average annual temperature of 27.2 °C. The area experiences significant rainfall, with an annual average of 1723 mm (Climate-data, 2013).

Obi LGA, one of the 23 Local Government Areas of Benue State, is located in the central agricultural zone (Zone C) and the Middle Belt zone. It lies between latitude 0705′ and 70 15′N and longitude 90 and 90 6′E, covering an

estimated land area of 2229 km². The population is approximately 168,491 (National Planning Commission, 2006). The area experiences a tropical climate, with an annual temperature of about 27°C (Benue State Government, 2006). The region has two distinct seasons: a wet season from April to October and a dry season from November to March.

Agatu LGA, carved out from Apa LGA in 1996, comprises 10 wards and stretches from latitude 7°45′ to 8°N and longitude 7°50′ to 8°E. The LGA has a total area of about 1001 km² and a population of 115,597 people (2006 Census). Agatu shares borders with Nasarawa State to the North, Apa LGA to the South, Gwer West to the East, and Omale LGA (Kogi State) to the West. The area experiences two distinct seasons: a rainy season from April to October and a dry season from November to March, with temperatures ranging from 23 to 35°C (Ngustav and Akaahan, 2002). The study area falls within the Southern Guinea Savannah, characterized by coarse grasses and scattered tree species. Persistent clearance for arable agriculture and bush fallowing has led to regrowth vegetation. Economic vegetation includes locust bean, shea tree, mahogany, *Isoberlina doka*, and fruit trees like mango.

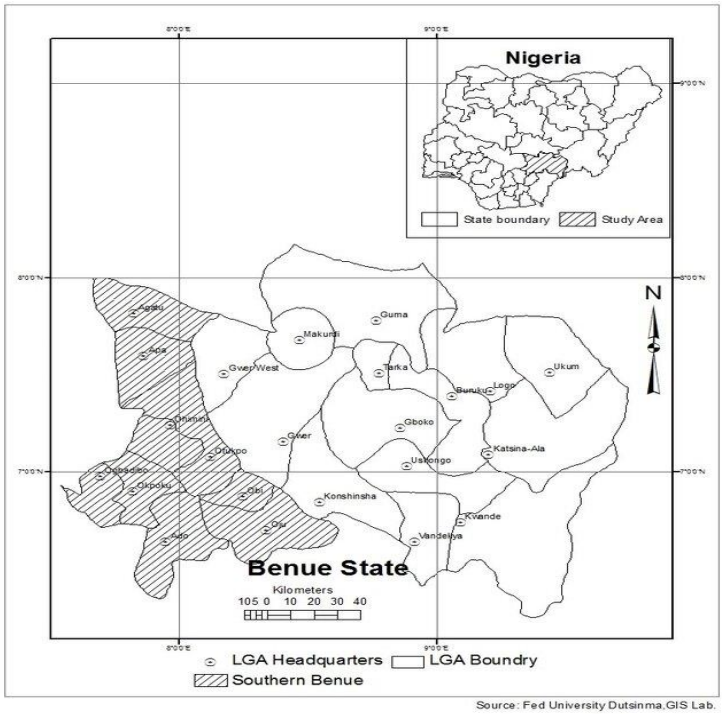

Fig. 1: Map of study area

Research Methodology

This study was conducted across the five local government Areas (LGAs) of Benue South Senatorial zone, Nigeria, namely Agatu, Apa, Otukpo, Ador, and Obi. A systematic selection of participants from these LGAs was made for administering questionnaires and focused group discussions (FGDs). Additionally, key informant interviews (KIIs) were conducted to gather relevant information from respondents.

To determine the sample size, Krejcie and Morgan's (1970) method was employed. According to this method, for a population ranging from 500,000 to 10,000,000, a sample size of 783 is recommended. Each LGA received an equal number of questionnaires, which can be expressed mathematically as:

$$\text{Qi} = \frac{QT}{N}$$

Where:

- Qi = Number of questionnaires allocated to each LGA
- QT= Total number of questionnaires (790)
- N = Number of LGAs (5)

$$\text{Qi} = \frac{790}{5} = 158$$

Thus, each LGA received 158 questionnaires.

	LGAs	Population (2006 Census)	Allocated sample size
1	Apa	96,780	158
2	Agatu	115,597	158
3	Otukpo	266,411	158
4	Ohimini	70,688	158
5	Obi	8,707	158
	Total	558,183	790

Source: Fieldwork, 2024.

A purposeful sampling technique was employed to administer questionnaires across the five LGAs of the study area. A total of 790 questionnaires were distributed equally among the five LGAs, with 158 questionnaires allocated to each LGA, ensuring proper representation. Of these 790 questionnaires administered, yielding a response rate of 92.4% (n = 729), which formed the basis of the dataset analyzed in this study.

The collected data were analyzed and discussed using descriptive statistics, including frequency tabulation and percentage. The Relative Importance Index (RII) technique was utilized to assess the impact of deforestation on agricultural activities. Respondents' answers were examined, ranked, and

scored based on their frequency using the RII method, providing a comprehensive understanding of the relationships between deforestation and agricultural activities.

RII is donated by $\frac{\Sigma W}{AXN}$ ..... (1)

Where

- W= weight given to each factor by respondents
- A= Height or Weight (i.e 5)
- N= Total number of the respondents

Results

The demographic analysis revealed that the majority (97%) of the respondents were male, while only 3% were female. The findings also present the marital distribution of the respondents, indicating that 62% are married, followed by 17% who are divorced, 13% widowed, and 9% single. The occupational distribution of the respondents reveals that a significant majority (70%) are farmers, with farming being their primary occupation. Additionally, 14% of the respondents engage in self-reliant jobs to ensure their daily survival. A smaller proportion of respondents, 13%, are employed as civil servants, while 3% are involved in other occupational activities. The result furthered presents the educational background of the respondents, indicating that 16% attended primary school, 24% attended secondary school, and 20% attended higher institutions at various levels. However, a significant proportion (40%) had no formal education. Despite this, the results suggest that a substantial number of respondents have received some form of education in the study area. Furthermore, the findings in table one reveals the number of years respondents have lived in the study area. The majority (38%) have resided there for 20-30 years, followed by 35% who have lived there for 31-40 years, and 27% who have lived there for 40 years or more.

Table 1: Demographic characteristics of the respondents

Distribution of respondents by sex		
Variable	Repondents	Percentage
Male	509	70
Female	220	30
Total	729	100
Marital status	450	62
Married	120	17
Divorce	92	13
Widowed	67	9
Single	729	100
Total	511	70
Respondents by occupation	101	14
Farming	92	13
Self employed	25	3
Civil servant	729	100
Others	120	16
Total	171	24
Level of education	143	20
Primary	295	40
Secondary	729	100
Tertiary	275	38
Nonformal education	257	35
Total	197	27
Years of residency		
20 — 30		
31 —40		
40 & above		
Total	729	100

Source: Fieldwork 2024

Table 2 reveals that a significant majority (71%) of the respondents are aware of the impact of deforestation on agricultural activities, while 29% are not aware. This high level of awareness can be attributed to the widespread use of social media platforms, which facilitate seamless information sharing and

accessibility among the public.

Table 2: Level of awareness on the impact deforestation on agricultural practices

Level of awareness	Respondents	Percentage
Aware	521	71
Not aware	208	29
Total	729	100

Source: Field work (2024).

Figure 2 reveals that a significant proportion of respondents (34%) perceived changes in agricultural yields in the area within 6-10 years, while 28% experienced changes over the last 11-15 years. Additionally, 17% noticed changes within less than 5 years, 14% between 16-20 years, and 7% 21 years or more ago.

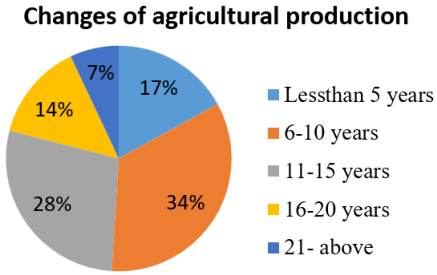

Fig. 2: Noticed of changes in agricultural production. Source: Fieldwork (2024).

Table 3 presents the four major causes of deforestation in the study area, ranked using the Relative Importance Index (RII). The ranking criteria were: RII > 0.94 (highly causative), 0.90 (fairly high), 0.79 (fairly low), and 0.48 (very low). The results reveal that two practices are major causes of deforestation: farmland expansion for agricultural practices, cutting of trees for timber production, fuel wood harvesting for energy consumption and charcoal production, and clearing of vegetation for settlement expansion.

The data show that fuel wood harvesting is the leading cause of deforestation, with an RII of 0.94 (high), followed by timber production with an RII of 0.90 (fairly high). Farmland expansion has an RII of 0.78 (fairly low), while settlement expansion has an RII of < 0.48 (very low).

Table 3: Causes of deforestation in study area

	Causes of deforestation	SA	A	U	SD	D	RII	RANK
1	Farmland expansion	226	381	29	58	35	0.79	3
2	Timber production	429	247	04	08	14	0.90	2
3	Fuel wood harvesting	243	374	39	34	39	0.94	1
4	Settlement expansion	84	106	20	341	178	0.48	4

Sources: Fieldwork (2024).

Table 4 presents respondents' feedback on the impact of deforestation on agricultural activities. A majority (56%) agreed that reduced crop yields are a major impact, with 27% strongly agreeing. Regarding the loss of soil nutrients, 39% of respondents agreed, 29% were undecided, and 23% strongly agreed. Furthermore, 54% of respondents believed soil erosion and desertification are physical impacts of deforestation, with 37% strongly agreed.

The respondents' perceptions of climate change, water cycle disruption, and drought experiences were also recorded. Notably, 39% strongly disagreed that deforestation causes climate change, likely due to strong religious beliefs. Additionally, 43% disagreed that they experienced drought in recent years, indicating that drought is not a prevalent issue in the study area.

Where: SA- Strongly Agreed; A- Agreed; U- Undecided; SD- Strongly Disagreed; D- Disagreed

Table 4: Impact of deforestation on agricultural activities

	Variables	SA	A	U	SD	D
1	Reduced in crop yield	199 (27%)	408 (56%)	34 (5%)	29 (4%)	59 (8%)
2	Loss of nutrients	167 (23%)	286 (39%)	209 (29%)	20 (3%)	47 (6%)
3	Presences of soil erosion and desertification	271 (37%)	397 (54%)	05 (1%)	18 (3%)	38 (5%)
4	Climate change and water cycle disruptions	94 (13%)	113 (15%)	181 (25%)	254 (39%)	87 (12%)
5	Drought experiences	89 (12%)	111 (15%)	32 (4%)	188 (26%)	309 (43%)

Sources: Field work (2024).

Figure 3 indicated community responses regarding adaptation strategies to mitigate excessive deforestation in the study area. A significant 34% of respondents considered substituting fuel wood extraction with sustainable energy options as the best approach to combat deforestation, driven by the fact that many residents rely on charcoal and fuel wood due to economic constraints. The interaction with the respondents in figure 2 also revealed that 27% perceived that awareness campaign and programs can also contribute massively in curbing the excessive deforestation practices in the study area. The study further indicated that policy enforcement with 14 %, followed by sustainable agricultural practices of 15% and reforestation and agroforestry programs of 10% are also among the proper strategies to combat deforestation practices in the study area.

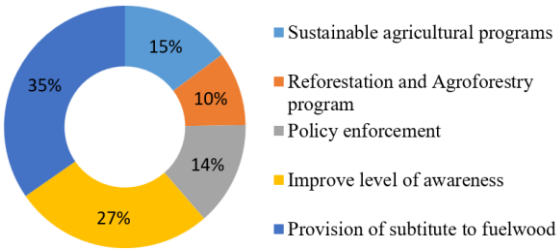

Fig. 3: Adaptation strategies to mitigate the deforestation menaces. Source: Fieldwork (2024).

The results revealed that out of five obstacles to effective deforestation prevention measures, limited awareness and lack of education among respondents ranked highest, followed by high costs of sustainable practices (RII score: 0.80), limited funding (RII score: 0.56), population pressure (RII score: 0.45), and resistance to changes (RII score: 0.38).

Table 5: Obstacles to effective deforestation prevention measures

	Obstacle to effective deforestation prevention measures	SA	A	U	SD	D	RII	Rank
1	Limited funding	108	87	251	148	135	0.56	3
2	Resistance to changes	56	41	28	276	328	0.38	5
3	High cost of sustainable practices	309	286	41	27	66	0.80	2
4	Limited awareness and education	421	158	18	90	42	0.82	1
5	Population growth and pressure	102	91	24	214	214	0.45	4

Sources: Field work (2024).

Discussion

The demographic analysis revealed that the majority (97%) of the respondents were male, while only 3% were female. This skewed distribution may be attributed to the dominant role males play in providing for their households' basic needs, such as food. In many African societies, including Nigeria, women often face social barriers that limit their access to property rights, resulting in fewer resources and capabilities compared to men (Gbegeh and Akubuito, 2013). This finding aligns with the study by Dantani et al. (2020), which reported that out of 120 respondents, 109 (91%) were males and 11 (9%) were females. The preponderance of male farmers in the study area may be due to the traditional division of labor, where women's work revolves around household chores. However, this does not imply that males outnumber females in the entire study area. The findings also present the marital distribution of the respondents, indicating that 62% are married, followed by 17%

who are divorced, 13% widowed, and 9% single. This distribution suggests that the majority of the respondents' household members are married, implying that they have larger families to provide for. Consequently, married household members are more likely to engage in farming activities to ensure food security and generate income for their families, compared to single and divorced household members. This Agreed with findings of Gana et al (2022), who suggested that agricultural practices in the study area is mostly associated with the married individuals and it is also likely that they engaged their family members in farming activities and hence making farm work relatively simple in operation.

The occupational distribution of the respondents reveals that a significant majority (70%) are farmers, with farming being their primary occupation. Additionally, 14% of the respondents engage in self-reliant jobs to ensure their daily survival. A smaller proportion of respondents, 13%, are employed as civil servants, while 3% are involved in other occupational activities. These findings highlight that farming is the dominant occupation in the study area, with the majority of respondents being fully engaged in farming activities. This is mostly common within most rural communities of Nigeria and Africa at large. This is in consistent with the findings of Quaye (2009), who said that about 70% Nigerians are farmers. The result furthered presents the educational background of the respondents, indicating that 16% attended primary school, 24% attended secondary school, and 20% attended higher institutions at various levels. However, a significant proportion (40%) had no formal education. Despite this, the results suggest that a substantial number of respondents have received some form of education in the study area This implies that the respondent’s level of education could Influence their living activities or potentials in the forest zone on their Socioeconomic status which should be used to boost production. This also indicates that agricultural activities in this area are mostly dominated by the respondents who had formal education. According to Adekunle (2009), pointed out that education is one

of the important human capitals which play important roles in determining status in society. Education is expected not only to contribute to people's ability to read and understand instructions but also help them to adopt new techniques. This could lead to more direct employment generation, better economic empowerment and well-being of the populace. Correspondingly, World Bank, (2006) quoted that education is one of the potentials rural residents have in improving their socio-economic rank. It is understood that most people in these settlements under study have attempted to acquire some formal education but the majority stopped at secondary school and this cuts across the various age category. Furthermore, the findings in table one reveals the number of years respondents have lived in the study area. The majority (38%) have resided there for 20-30 years, followed by 35% who have lived there for 31-40 years, and 27% who have lived there for 40 years or more. This finding aligns with the study by Hassan and Nhemachena (2018), which reported that farmers knowledge and experience of their environment increase with the amount of time they spend working the land.

Table 2 reveals that a significant majority (71%) of the respondents are aware of the impact of deforestation on agricultural activities, while 29% are not aware. This high level of awareness can be attributed to the widespread use of social media platforms, which facilitate seamless information sharing and accessibility among the public. According to Nzeh (2012), the level of awareness is imperative to reduce the rate of deforestation. This finding is consistent with the study by Saleh et al. (2024), which reported that approximately 77% of respondents in Apa LGA of Benue State were aware of the environmental effects of deforestation. Figure 2 reveals that a significant proportion of respondents (34%) perceived changes in agricultural yields in the area within 6-10 years, while 28% experienced changes over the last 11-15 years. Additionally, 17% noticed changes within less than 5 years, 14% between 16-20 years, and 7% 21 years or more ago. These findings indicate significant changes in agricultural production, primarily caused by the severe

impact of deforestation activities in the study area.

Table 3 presents the four major causes of deforestation in the study area, ranked using the Relative Importance Index (RII). The ranking criteria were: RII > 0.94 (highly causative), 0.90 (fairly high), 0.79 (fairly low), and 0.48 (very low). The results reveal that two practices are major causes of deforestation: farmland expansion for agricultural practices, cutting of trees for timber production, fuel wood harvesting for energy consumption and charcoal production, and clearing of vegetation for settlement expansion. This perspective is different from the argument advanced by Insaidoo et al., (2012) who acknowledged the bush fires, indiscriminate logging and conversion of forest to farmland as the main causes of deforestation. The data show that fuel wood harvesting is the leading cause of deforestation, with an RII of 0.94 (high), this finding agreed with the work of (Ndegwa et al., 2020). Who suggested that Statistics from the Kenya Bureau of Statistics have listed charcoal as the top two sources of fuel for Kenya, after firewood the energy use in Kenya defies the energy ladder theory where it is estimated that with the growth of the disposable income in the country, among the households in Kenya, people should transition from the cheap sources of energy like charcoal and firewood to more sustainable sources of energy like the Liquefied Petroleum gas (LPG) and electricity. The result further followed by timber production with an RII of 0.90 (fairly high). This suggests a high degree of dependence on trees as a primary source of wood for construction, furniture, fuel, and other essential products (Amadi et al., 2006). The study of Collins (2020), suggested that Logging problem in the country has been fueled by the increasing rise in demand for wood products by large construction companies and the trees that are cut in the country do not even meet the demand for the raw materials for furniture making and building. Farmland expansion has an RII of 0.78 (fairly low), This result is disagreed with the findings of Wuyep et al (2020) who suggested that agricultural expansion is the leading cause of deforestation in Jos East, Plateau State. Similarly Gimah (2019), noted that agricultural expansion and

practices are the major cause of deforestation. Settlement expansion has an RII of < 0.48 (very low). This is in consistent with the findings of Reliefweb.net. (2021). Which reported that, the subdivided land into plots makes it necessary to cut down trees so that other economic activities that can be supported by the small farms can be put in place. This has given rise to the high-cost plots of land in the urban and semi-urban areas that are exclusively used for residential purposes.

Table 4 presents respondents' feedback on the impact of deforestation on agricultural activities. A majority (56%) agreed that reduced crop yields are a major impact, with 27% strongly agreeing. This aligns with findings by Lawrence and Vandecar (2015) and Oliveira et al. (2021), which highlight deforestation's negative effects on agricultural productivity due to reduced rainfall, increased temperatures, and extreme heat events. Regarding the loss of soil nutrients, 39% of respondents agreed, 29% were undecided, and 23% strongly agreed. This finding correlates with the study of Brandão Jr. A., et al.'s (2020) which suggest that deforestation leads to a 10-20% decline in crop yields due to reduced rainfall and soil fertility. Furthermore, 54% of respondents believed soil erosion and desertification are physical impacts of deforestation, with 37% strongly agreeing. The findings also agreed with the work of Mulinge et al., (2015). Who reported that the degradation of land as a result of soil erosion is a factor that has reduced livestock farming because there is no grass on the surface of the earth. This leads to the reduced milk and meat production. Soil erosion in the country has also been noted as one of the threats to food security because the soil nutrients that would have otherwise supported wheat, rice, and maize farming are depleted. The respondents' perceptions of climate change, water cycle disruption, and drought experiences were also recorded. Notably, 39% strongly disagreed that deforestation causes climate change, likely due to strong religious beliefs. Additionally, 43% disagreed that they experienced drought in recent years, indicating that drought is not a prevalent issue in the study area. This finding disagreed with

the study of Macdonald (2018), which acknowledged that the forest also protect the soil moisture which is often retained in the root systems of the trees. When these trees are cut, the rate of the diminishing of the soil moisture occurs at a similar rate to the rate of the diminishing of the clouds.

Figure 3 indicated community responses regarding adaptation strategies to mitigate excessive deforestation in the study area. A significant 34% of respondents considered substituting fuel wood extraction with sustainable energy options as the best approach to combat deforestation, driven by the fact that many residents rely on charcoal and fuel wood due to economic constraints. These results corroborate the work of Saleh et al. (2024) who discovered that 30% of the respondents believed that replacing alternative energy sources to fuel wood extraction is the best approach to reducing deforestation practices in Apa LGA of Benue State. The interaction with the respondents in figure 2 also revealed that 27% perceived that awareness campaign and programs can also contribute massively in curbing the excessive deforestation practices in the study area. These findings echo the discoveries made by Amadi et al (2021) who discovered that educating community on effect of deforestation is the effective method in mitigating the deforestation practices in the area. In similar findings by United Nations Convention on Combating Desertification works with the local government to train the local communities, the women, and the children for instance to better interact with the natural resources so that they can fully participate in activities that help in the restoration of the forest cover. Some of the key initiatives that have been taking place include the Desertification Day where the wide-ranging awareness programs are laid out and the members of the community are reminded of the need to be cooperative, collaborate, and actively engage in the environmental conversation activities (NEMA, 2020). The study further indicated that policy enforcement with 14 %, these findings agree with the study of Gana et al (2022) who recommended that enforcement against logging, education on effects of deforestation, reintroduction of tree planting programs, as well as

nurseries should be established in each community to enable them raise seedlings for planting. The sustainable agricultural practices constitute 15% which is in line with the findings of Meek (2019), Forested lands of more than 50,000 acres are cleared by farmers and loggers everyday worldwide, and the equivalent of over 10,000 football fields are destroyed daily in the Amazon Basin alone. Reforestation and agroforestry programs of 10% are also among the proper strategies to combat deforestation practices in the study area.

The results in table 5 revealed that out of five obstacles to effective deforestation prevention measures, limited awareness and lack of education among respondents ranked highest. The study of Nemecek, (2018) reveals that Ignorance of the people especially in the rural areas like Kibale and Kigezi, who have inadequate knowledge about the value of forests. Such simply destroy forests because they look at them as obstacles to more meaningful land use. The high costs of sustainable practices (RII score: 0.80), limited funding (RII score: 0.56), population pressure and poverty (RII score: 0.45), In the process of feeding, sheltering and improving human well-being, the poor have to depend immensely on resources from their own local environment, leading to deforestation (Al-Amin, 2014). The result further shows that resistance to changes (RII score: 0.38). This finding is in line the study of Bzugu et al (2019) which reported that about 22.3% of his respondents agreed that resistance to changes are among the major setback in curbing deforestation practices in the study area. These findings indicate that respondents in the study area lack awareness and critical knowledge about the negative impacts of deforestation on agricultural production

Conclusion and Recommendation

This study aimed to investigate the impact of deforestation on agricultural activities and identify management strategies to mitigate deforestation practices in selected local government areas in Benue South. Forests play a vital

role in maintaining ecosystem balance and supporting sustainable agriculture, but deforestation driven by timber production, fuel wood harvesting, farmland expansion, and settlement growth threatens community livelihoods and agricultural production. Despite concerns about deforestation, many respondents were unaware of its severe consequences, including reduced crop yields, soil nutrient loss, erosion, desertification, drought, and climate change. The findings emphasize the need for alternatives to fuel wood, sustainable agricultural programs, policy enforcement, and raising public awareness about the catastrophic effects of deforestation on agricultural production.

To address this, governments and NGOs should implement poverty alleviation programs and provide essential infrastructure, such as electricity and affordable cooking alternatives, to reduce dependence on fuel wood. Policies should promote tree plantation initiatives, environmental sustainability, and the enforcement of regulations to curb excessive deforestation.

Adequate funding should be allocated for adaptation strategies, including incentives to discourage deforestation and the establishment of protected green belt areas. Additionally, environmental education efforts should be intensified, particularly in rural communities, to raise awareness about long-term effects of deforestation and promote sustainable land-use practices.

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