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ANTHROPOGENIC ACTIVITIES AND THEIR IMPACTS ON BIODIVERSITY SURVIVAL IN IFELODUN LOCAL GOVERNMENT AREA, KWARA STATE, NIGERIA

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ABSTRACT

Biodiversity plays a significant role in the socio-economic development of man. Therefore, careful use of biodiversity is an essential requirement for sustained global development. However, available data points to a high rate of biodiversity loss especially in developing countries which has been attributed to a combination of human-induced factors, including rising demand for and consumption of natural resources. This paper identifies those human activities that result in irreversible loss of biodiversity using the Ifelodun Local Government Area of Kwara State as an example. A structured questionnaire containing information on the people's activities influencing biodiversity loss, the effects of biodiversity loss, and socio-economic characteristics among other questions were randomly administered to 250 residents of the Local Government Area. Residents Agreement Index (RAI), descriptive statistics (frequencies and percentages) and, regression analysis were used to explain the causes and effects of biodiversity loss. Ten major activities were identified to be influencing irreversible biodiversity loss. They are, cattle rearing (1.21), logging (0.89), road construction (0.81), culture (0.79) and herb harvesting (0.59), poaching (-0.69), farming (-0.61), Industrial activities (-1.59), energy generation (-1.32) and settlement development (-0.05). Theeffects of biodiversity loss include poor crop yield (43.2%), soil erosion (31%), a threat of desertification (12%), reduction in the number of wildlife (9.6%), reduction in timber production (4.2%). The results of the regression analysis show that biodiversity loss is a function of the socio- economic characteristics of people. The paper concluded that though the socio-economic development of a society is attached to its biodiversity exploitation, careful, diligent, and sustainable use of these resources is required.

Keywords: Biodiversity, human activities, medicinal plants, socio-economic characteristics, biodiversity loss.

1.1 Introduction

Biodiversity refers to the wealth of life found on the millions of plants, animals, and micro-organisms that live on the planet earth, the genes they contain, and the intricate and often delicate ecosystem they form (Wilson, 1992). It is essentially the combination of life

forms and their interactions with one another and with the physical environment that has made earth habitable for humans (Emma–Okafor, Ibeawuchi and Obiefuna, 2010). Biodiversity provides the necessities for life, offers protection from natural disasters and diseases, and serves as the foundation for human culture (Ozor, Acheampong and Ayodotun, 2010). Thus, its continued existence is required for the survival of the human race. The services provided by a healthy and biodiverse ecosystem are the foundation for human well-being, hence, its value to humans for economic, health, recreational, and cultural benefits. Direct economic benefits are derived from species such as those used for food, building materials, fuel, fiber, or as sources of genes to improve cultured crops. Forinstance, bushmeat is reported to account for about 25% of the annual consumption of animal protein in Nigeria between 1970 and 1999 (Akani, Petrozzi and Ebere, 2015). The value of this is conservatively estimated to be about 10 million dollars annually, while fish and other aquatic animals consumption amounted to about 55 million dollars, bringing the total value of wild animal protein to about 65 million dollars annually (Friant, Paige, Goldberg, 2015; Kalu and Aiyeloja, 2002).

Species are equally sources of pharmaceutical compounds, providing medicinal drugs for curing and preventing illness in man. More than 40% of the prescriptions each year in the United States contain a drug of natural origin either from higher plants (25%), microbes (13%) or from animals (3%) as sole active ingredients or as one of the main ones (Staudinger, Carter and Cross, 2013). The value of medicines from higher plants alone is reported to be about 300 million dollars per annum (Nwachukwu, Umeh and Kalu, 2010; Kigigha and Kalunta, 2017). Equally, the amount of oxygen in the air we breathe ismaintained by photosynthesizing plants. Biodiversity also provides the opportunity to further the cause of educational and scientific research. The discovery in the early 1970s that Armadillos are the only animals other than human beings known to contact leprosy proved invaluable in the search for a cure for this disease (WRI, IUCN, UNEP, FAO and UNESCO, 1992). Furthermore, the discovery in the 1980s that polar bear hairs are exceptionally efficient heat absorbers provided the researchers with a clue to develop materials for the manufacture of better cold-weather clothing and solar energy collectors (Mora *et al*., 2011). Biodiversity also plays a significant role in human recreation through the conversion of existing forest areas to the tourist center, parks, and gardens, zoological gardens, etc (Yager, Alarape, Gideon, 2015). It also plays an important role in the cultural preservation of some societies. For instance, Osun groove in Osogbo, Osun State, serves as a reminder of the significance of Osun River in the establishment and development of OsogboTownship, and provides the basis for the celebration of Osun festival in Osogbo, Nigeria, till date. Insects, birds, and bats pollinate crops; many species control pest populations, wetland act as giant sponges to control floods, plants moderate climates and create habitat and food for species used by man, while bacteria breakdown dead organic

matter and generate soil (Losey and Vaughan, 2006; Wilson et al., 2012). Thus, the benefits of maintaining biodiversity have been estimated to be, hundred times greater than the cost, and a well-managed biodiversity help to sustain the adaptive capacity of life (Ibimilua, 2013; Unanaonwi and Amonum, 2014).

It has however been observed that this important component of the human environment has suffered unprecedented destruction in the last few decades in Africa and particularly in Nigeria. As reported by FAO (2007), Africa accounts for 16% of the total global forest area, but it has lost over 9% of these between 1990 and 2005. Nigeria appears to be the worst culprit in this regard as the report indicates the country to be the largest loser of natural forest globally with 55.7% forest resources depletion between 2000 and 2005. The report further predicted that at 11.1% annual deforestation rate, the country is on the verge of losing virtually all of its primary forest within a few years. Similarly, FAO (2015) reported that Nigeria's forests are threatened as the forest cover declined from approximately 24 million hectares in 1976 to 15 million hectares in 1995 and down to 9.6 million hectares in 2011. Although the Nigerian government established several forest reserves for the conservation of forest resources, these forest reserves have been seriously neglected and received little or no improvement in terms of investment and management (Convention of Biological Diversity, 2015). These losses imply that many plants andanimals, including many potentially valuable species, are on the fast track to extinction. According to Mongabay (2016), animals that have recently disappeared from Nigeria include Cheetah, pygmy hippopotamus, giraffe, black rhinoceros, and the giant eland. Also, about 12 species of primates including the white-throated guenon species of primates are under threat. Similarly, an estimated 484 plant species from 112 families are threatened with extinction due to deforestation (Mongabay, 2016).

A National Assessment of Biodiversity Report by NCF (2018) confirmed the reality of the high rise and fast-tracked increase in biodiversity loss in Nigeria. The ongoing loss of biodiversity in Nigeria has been observed to be driven by a combination of human-induced factors, including rising demand for and consumption of natural resources (Mustapha,2006; Amosu, et.al., 2012; Oribhabor, 2016; Izah et al., 2017). This paper, therefore, seeks to identify those human activities that result in irreversible loss of biodiversity in Ifelodun Local Government Area of Kwara State, Nigeria. Ifelodun LGA was chosen because of the observed high rate of habitat loss and the persistent threat of the emergence of Sahel vegetation in the area.

2.1 Study Setting and Methodology

2.2 The Study Setting

The study was conducted in the Ifelodun local government area of Kwara State, Nigeria. It is located between latitudes 8°30 N to 9° 30 N and 4° 30E to 5° 30E with a total land area of about 2,236 km2 (Kwara State Government Directory, 2010). Ifelodun local government area was created in 1976 with the headquarters at Shaare. It shares common boundaries with, Asa, Ilorin-South, Ilorin-East in the North, Oke Ero, and part of Kogi state in the East, in the North by Edu and Pategi while in the south by 1sin, Irepodun, and Oyun Local Government Areas. The local government has over 600 towns and villages with a total projected population of about 276,700. The population figure is distributed amongstthe nine districts and eighteen political wards. The weather and climate of Ifelodun are influenced

by two prevailing winds: the Southwest trade wind or tropical maritime air mass and Northeast trade wind or tropical continental air mass (Kwara State Government Directory, 2010). These winds resulted in two major seasons – wet and dry seasons. The wet season starts in April and ends in October, the area receives rainfall from the south- westerly air masses, which invaded the country form the gulf guinea coast. The most air stream is overhead by the northeast trade wind which originated from the above the Sahara and therefore brings dry and deist environmental between October and much. The highest rainfall usually occurs between June and July while the mean annual rainfall is about 1000mm; the mean annual temperature is 28.5°C while the relative humidity of the area is between 90-95% (Kwara State Government Directory, 2010).

The vegetation of the area is guinea savanna. The landscape is mostly cover with closed to open shrubland characterized by forest along streamsides, tall grasses, withscattered perennial trees overland (Kwara State Government Directory, 2010). The soil with the clay-enriched lower horizon, low check, and high saturation of bases resulted in ferruginous tropical soil on crystalline acid rocks. However, the soil is dominated by red feral soils on loose sandy sedimentary rocks (Kwara State Government Directory, 2010). The topography of the area is generally flat and undulating land with interline and lacotrine deposits. Transportation was poorly developed which has made accessibility in the study area very difficult and consequently militated to some degree, against the level of infrastructural development of the study area (National Institute for Cultural Orientation, 2017). Other infrastructural facilities available include water supply, boreholes, and wells sunk by the local government, private establishments and individuals, electricity supply, police station, post office, banks, educational and health facilities (National Institute for Cultural Orientation, 2017). The socio-economic activities (such as farming, trading,

pottery making, and weaving) of the people in the study have greatly influenced its growth in recent times.

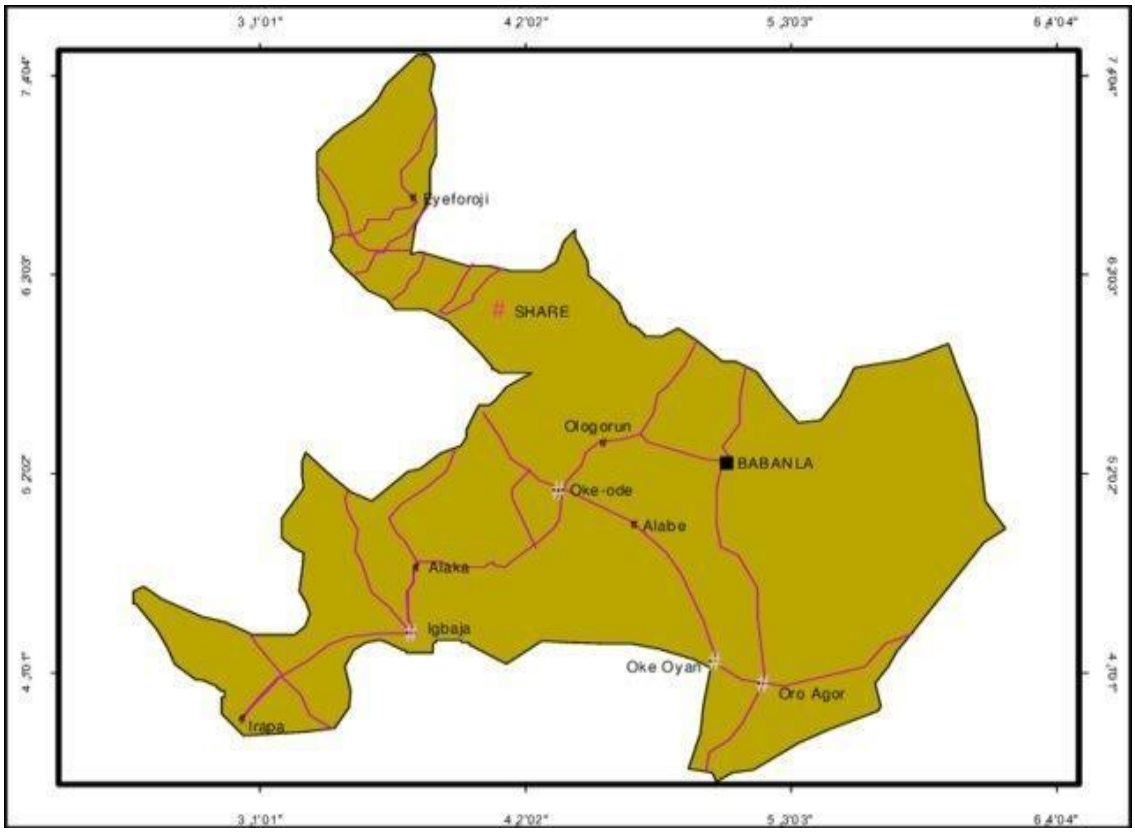

Fig. 1: Map of Ifelodun Local Government Area

2.3 Methodology

Both primary and secondary data were used for this study. Primary data collection involved the administration of a pre-tested questionnaire to the residents of the study area. Data obtained from the Department of Community Development of Ifelodun Local Government Area indicated that there are 56 settlements (towns and villages) in the Local Government Area. However, preliminary investigations revealed that 28 out of the 56 settlements have consistently experienced biodiversity loss in the last 20 years. All the 28 settlements were selected for the survey. Also, information obtained from the National Population Commission put the projected number of households in the Local Government Area at 6,859. A sampling ratio of 3.5% was used to randomly draw 250 households from

the settlements. One respondent was sampled in each household, making a total of 250 respondents from the selected settlements (Table 1). A structured questionnaire containing information on the socio-demographic characteristics of the respondents, causes, and effects of biodiversity loss in the area among other questions was administered to the respondents and the questionnaire administration was targeted at only adult members of the households who had lived for upward of twenty years in the area. The interview guide was also used to elicit information from the officials of the Department of Forestry of the State Ministry of Agriculture. Personal observations using the observation checklist equally contributed to primary data collection.

The data collected were then cleaned, organized, and entered into SPSS version 21 software for further processing. Descriptive (frequencies and percentages) and inferential statistics (multiple regression analysis) were used in analyzing the data. The human activities resulting in biodiversity loss in the study area were assessed through the Residents Agreement Index (RAI). For this study, ten (10) variables that could influence biodiversity loss were identified. It is believed that the level of agreement of the residents in the study area would indicate the level of influence these variables have on biodiversity loss in the study area. To calculate the RAI, the sampled residents were instructed to rate each variable using one of the five ratings: Strongly Agree (SA) – 5, Agree (A) – 4, Just Agree (JA) – 3, Disagree (DA) – 2 and Strongly Disagree (SD) – 1. The summation of weight value (SWV) for each variable is obtained through the addition of the products of responses for each rating of the variable and their respective weight values. Mathematically, this is expressed as:

$$SWV = \sum_{i=1}^{5} X_i Y_i \quad \text{equation (1)}$$

Where: SWV is the summation of weight value;
X_i is the residents rating of a particular variable influencing biodiversity loss;
Y_i is the weight value assigned to each variable.
The residents' agreement index (RAI) for each variable is arrived at by dividing the summation of weight value by the addition of the number of respondents to each of the five ratings. This is expressed as:

$$RAI = \frac{SWV}{\sum_{i=1}^{5} P_i} \quad \text{equation (2)}$$

To further explain the effect of anthropogenic activities on biodiversity survival, the hypothesis was formulated and tested:

H_0: Biodiversity loss is not a function of the socio-economic characteristics of people.

H_1: Biodiversity loss is a function of the socio-economic characteristics of people.

The hypothesis was analyzed using multiple regression analysis. Secondary information such as the rate of biodiversity loss in the area was obtained from journal articles, theses, and dissertations.

Table 1: Sampled Settlements in Ifelodun Local Government Area

S/N	Settlements	No. of Households	No. of Respondents
1	Igboja	743	26
2	Oke-Iya	429	15
3	Yaru	286	10
4	Layinka	286	10
5.	Aba-Ayan	286	10
6.	Omupo	571	20
7.	Oreke	343	12
8.	Babanla	371	13
9.	Amodu-Asunbolu	343	12
10.	Ore-Ayo	429	15
11.	Ora	286	10
12.	Salu	257	09
13.	Oke-Ode	429	15
14.	Sagbe	400	14
15.	Agbeku	171	06
16.	Bankole	143	05
17.	Alasoro	114	04
18.	Bayero	86	03
19.	Ologorun	86	03
20.	Kere-Aye	114	04
21.	Asungbale	143	05
22.	Eleware	86	03
23.	Omi-Aro	114	04
24.	Okuta-Oko	86	03
25.	Agbee	143	05
26.	Patako	114	04
27.	Oke-Ayo	143	05
28.	Odo-Eku	143	05
	Total	**6,859**	**250**

Source: Authors' Analysis, 2019.

3.1 RESEARCH RESULT

3.1.1 Socio-Demographic Profile of the Respondents

Gender analysis of the respondents indicates that 82% were males while female respondents accounted for 18% of the respondents (Table 2). There was a substantial percentage of the economically active population with respondents who were in the age bracket of between 30 and 59 years accounting for 64.0%. Analysis of the educational status of the respondents shows that: 0.8% had Masters degree; 10.8% had Bachelor's degree; 20.8% had Senior School Certificate; 17.6% had Primary School Certificate; 21.2%obtained vocational education; 4,8% obtained Quranic education; while 24.0% obtained informal education (Table 2). The principal occupation was farming with 55.6% of the sampled residents being farmers. Other occupations of the respondents were civil service (21.2%); artisanship (12.4%); trading (8%); and clergy (2.8%) (Table 2). Analysis of the respondents' income shows that 59.6% earned less than ₦30,000 ($79) monthly, 24.4% earned between ₦30,000 ($79) and ₦100,000 ($263) while 9.2% earned above ₦100,000 ($263) (Table 2). To determine the income status of the respondents, the general classification of income into low, medium, and high was adopted. The monthly income below ₦30,000 ($79) was classified as low, income between ₦30,000 ($79) and ₦100,000 ($263) was regarded as a medium while income above ₦100,000 ($263) was classified as high. (₦380 = 1 USD as at February 2020). Thus, the majority of the respondents were low-income earners. Analysis of the respondents' religion shows that Islam was the dominant religion with Muslim respondents accounting for 71.6%.

Table 2: Socio-Demographic Profile of the Respondents

Variables		**Frequency**	**Percentage**
Gender	Male	205	82.0
	Female	45	18.0
	Total	**250**	**100.0**
Age	15-29	21	8.4
	30-44	68	27.2
	45-59	92	36.8
	60-74	54	21.6
	Above 74	15	6.0
	Total	**250**	**100.0**
Education	Master's	2	0.8
	Bachelor's	27	10.8
	Secondary	52	20.8
	Primary	44	17.6
	Vocational	53	21.2
	Quranic	12	4.8
	Informal	60	24.0
	Total	**250**	**100.0**
Occupation	Farming	139	55.6
	Civil Service	53	21.2
	Artisanship	31	12.4
	Trading	20	8.0
	Clergy	07	2.8
	Total	**250**	**100.0**
Income	Low(<₦30,000) ($79)	149	59.6
	Medium (₦30,000 (($79)-₦100,000) ($263)	61	24.4
	High (Above ₦100,000 ($263)	40	16.0
		250	**100.0**

	Total		
Religion	Islam	179	71.6
	Christianity	56	22.4
	Traditional Religion	15	6.0
	Total	**250**	**100.0**

Source: Authors' Analysis, 2019.

3.1.2 Human Activities Influencing Biodiversity Loss

As noted earlier, the Residents Agreement Index (RAI) was employed to statistically determine the human factors influencing biodiversity loss in the study area. Theresults of the analysis are presented in Table 3.

Table 3: Residents' Agreement Index (RAI)

S/N	Factors Influencing Biodiversity Loss	Rating and Weight Value					SWV	RAI	MD(RAI)
		SA (5)	A (4)	JA (3)	DA (2)	SD(			
1	Farming	12	24	61	82	71	574	2.30	-0.61
2.	Poaching	-	38	43	105	64	555	2.22	-0.69
3.	Logging	91	70	52	21	16	949	3.80	0.89
4.	Industrial Activities	-	19	22	78	31	329	1.32	-1.59
5.	Settlement Devt.	6	84	71	47	42	715	2.86	-0.05
6.	Road Construction	86	72	44	33	15	931	3.72	0.81
7.	Herb Harvesting	40	61	65	101	33	874	3.50	0.59
8.	Culture	82	76	51	17	24	925	3.70	0.79
9.	Energy generation	-	-	36	75	139	397	1.59	-1.32
10.	Cattle Rearing	109	81	42	18		1031	4.12	1.21
Average RAI (MS)		-						**2.91**	

Source: Authors' Analysis, 2019.

It could be established from the Table that, the highest RAI is 4.12 while the lowest is 1.32. The average RAI for the study area is 2.91. Therefore, the deviations around the mean of the highest and lowest RAI were 1.21 and -1.59 respectively. The variables with positive deviations around the mean (i.e. RAI) were the variables considered by the sampled residents as the leading activities influencing biodiversity loss. These variables are: cattle rearing (1.21), logging (0.89), road construction (0.81), culture (0.79) and Herb harvesting (0.59). The variables with negative deviations around the mean were those considered not to be the dominant/principal factors influencing biodiversity loss. The residents showed a lower level of agreement on them. Such variables include: poaching (-

0.69), farming (-0.61), Industrial activities (-1.59), energy generation (-1.32) and settlement development (-0.05).

3.1.3 Reasons for each Causative Factor

It is important to note that the socio-economic development of any community depends largely on biodiversity exploitation. However, the mindless exploitation of these resources has always been a major threat to the sustainable management of the resources. That was the reason respondents were asked to state why their various activities highlightedabove result in unsustainable exploitation of biodiversity. Five major reasons were given bythe sampled residents (Table 4): income-earning drive (36.0%), employment seeking activities of the people (22.8%), attempt to generate energy for domestic use (Firewood and charcoal) (20.0%), poor perception of the finite nature of biodiversity (15%) and desire for relevance (6.2%).

Table 4: Reasons for each Causative Factor

Causes	**Frequency**	**Percentage**
Income earning drive	90	36.0
Job opportunity	57	22.8
Attempt to generate energy	50	20.0
Poor perception of biodiversity	37	15.0
Desire for relevance	16	6.2
Total	**250**	**100.0**

Source: Authors' Analysis, 2019.

The result of the hypothesis further confirmed the effects of social and economic characteristics of the residents on biodiversity loss. Biodiversity loss was regressed against the six socio-economic variables. They are gender, age, education, occupation, income, and religion. The multinomial regression model derived from the analysis is given as: $Y = 67.036 + 31.142x_1 + 63.253x_2 - 18.217x_3 + 42.511x_4 + 36.304x_5 + 2.764x_6$ (Table 7). The r-value in the regression test is 0.653 while the r^2 is 0.608 (Table 5). This indicates that the six independent variables explain about 61% of the variations in the loss of biodiversity. Except for education, all the other five variables relate in a positive direction with biodiversity loss. The percentage explained by these five variables is relatively high and the F-test of the regression result shows that the relationship is significant (Table 6). Thus, biodiversity loss is a function of the socio-economic characteristics of people.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.653	.608	.273	.2410

a. Predictors: (Constant), Religion, Level of income, Gender of Respondent, Educational level, Age of Respondent, Occupation of respondent

Table 6: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1462.257	6	728.043	46.725	.000
Residual	6435.313	107	12.059		
Total	7897.570	113			

a. Dependent Variable: Biodiversity loss
b. Predictors: (Constant), Religion, Level of income, Gender of Respondent, Educational level, Age of Respondent, Occupation of respondent

Table 7: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
Constant	67.036	58.180		5.996	.000
Gender f Respondent	31.142	.526	.158	1.643	.103
Age of Respondent	63.253	.692	.036	.375	.709
Educational level	-18.217	.384	-.065	-.668	.506
Occupation of respondent	42.511	.237	-.023	-.233	.816
Level of income	36.304	.315	-.093	-.955	.342
Religion	2.764	.638	-.019	-.203	.839

3.1.4 Effects of Biodiversity Loss

The effects of biodiversity loss on the people and the environment were identified. Analysis of the data revealed that poor crop yield as the major effect as indicated by 43.2% of the respondents. This has consequently led to serious food shortages and high cost of staple food items. Soil erosion (31%) and the threat of desertification (12%) were equally identified as effects of biodiversity loss on the environment. This has on various occasions influenced damage to infrastructure, residential buildings, and farmlands. Also, biodiversityloss has led to either disappearance or drastic reduction in the number of available wildlife in the area as indicated by 9.6% of the respondents. While there was no means of physically

counting the wildlife as well as the absence of relevant data from the Kwara State Ministry of Agriculture, the sampled residents based their views on their reduced access to wildlife vis-à-vis what obtained in the past. Another consequence of biodiversity loss is the reduction in timber for building purposes leading to the high cost of wood and other timber products (4.2%) (Table 5).

Table 5: Effects of Biodiversity Loss

Effects	**Frequency**	**Percentage**
Poor crop yield	108	43.2
Soil erosion	78	31.0
Threat of desertification	30	12.0
Reduction in the number of wildlife	24	9.6
Reduction in timber production	10	4.2
Total	**250**	**100.0**

Source: Authors' Analysis, 2019.

4.1 DISCUSSIONS

The rate of biodiversity loss in the area including Ilorin is very alarming as about 41% of the total bio-diverse environment was lost within the space of thirty years - 1984and 2014 (Daramola, Aro, and Daramola, 2015). This has been mainly caused by cattle rearing, logging, road construction, culture, medicine, poaching, farming, Industrial activities, energy generation, and settlement development. Cattle's rearing was the leading cause of biodiversity loss in the study area. This can be attributed to the grazing-friendly nature of savanna vegetation. Logging is the second most important human activity influencing biodiversity loss in the area. This may be a result of the near absence of arobust and effective forest conservation program by the Kwara State Government. Also, government control of logging practice has focused more on the economic gain (through the collection of logging fees as well as arrest and prosecution of illegal loggers. Road construction is the third major activity causing biodiversity loss in the area. It was observedduring the fieldwork that the area has a fairly developed road network that connects most ofthe settlements in the area. While road construction is an important indicator of development, the inability of the community and government to minimize biodiversity loss through measures such as reforestation and land fallow to allow for natural recoveryappears to be responsible for the permanent loss of the bio-diverse environment to road construction.

Certain cultural practices also play an important role in biodiversity loss in the area. For instance, certain streams and rivers were believed to possess healing powers, therefore, the sick are usually asked to bath inside the rivers for effective recovery from their sickness. The materials used in bathing such as soaps, sponge, or leaves usually destroy

aquatic life and also render the water, less useful for the residents. Attempts to secure medicinal plants for the treatment of illnesses have led to the extinction of some plants while others are facing the threat of extinction. For instance, informal discussions with the residents of the area revealed that the area used to be rich in goldenseal, chamomile, *Hunterian umbellata, and Vernonia amygdalina* which are useful in the treatment of hypertension and diabetes but they are no more in existence. Poaching equally influenced biodiversity loss in the area because that is the major occupation of some residents. During traditional festivals in some settlements, hunters are expected to compete in the killing of game animals with the most successful receiving honor and gift items from the community.

Farming practices also play a significant role in the loss of biodiversity in the area. Due to population growth and expansion of settlements, agricultural land has been greatly diminished leading to over-cultivation of available land and consequently rendering the land unproductive. However, an attempt to re-engineer the land and make it productive has led to the widespread use of chemical fertilizer in the area. However, the washing of these chemicals by rain runoff to the nearby streams results in the partial destruction of aquatic life. Activities of small manufacturing also influenced biodiversity loss in the study area. For instance, the area is known for cassava flakes (Garri) production. The penchant of the cassava flakes manufacturers to allow the chemical extracted from cassava flow freely without control has led to permanent destruction of the environment in which these cassava flakes factories are located. Energy generation from forest resources has also been responsible for biodiversity loss in the area. This may be as a result of poor access to modern cooking facilities such as stove, gas or electric cooker. Also, the incessant increase in prices of kerosene and the inability of the people of the area in particular and Nigeria, in general, to easily secure the products in recent years seem to have influenced heavyreliance on firewood from the forest for cooking in the area.

Another factor influencing biodiversity loss is settlement development. With increasing population and increasing rate of family formation requiring more homes, there is bound to be a physical expansion of the settlements and consequently, destruction of biodiversity. Also, infrastructure development efforts of both the government and private sector/individuals especially, electricity, town hall, schools, and healthcare facilities require bush clearing and consequent loss of biodiversity. It is pertinent to note that, while infrastructure development is essential for the socio-economic development of the communities, poor physical planning and sitting of these facilities appears to be responsible for the unhealthy loss of biodiversity. While biodiversity exploitation offers enormous socio-economic benefits, weak government control has triggered mindless, wasteful, and unsustainable exploitation of the biodiversity in the study area. Ignorance of the importance of biodiversity to human survival, coupled with the low-income status of the people was found to be responsible for this phenomenon.

The effects of biodiversity loss on the people and environment are enormous. One of the major effects is food-shortage. The current increase in prices of food items in the area in particular and Nigeria, in general, can be partly attributed to the reduction in the farmland available to farmers and consequently reduced farming activities. Soil erosion is another effect of biodiversity loss in the area. The removal of vegetal cover throughsettlement development, agricultural, and other socio-economic activities naturally exposes the soil to rain run-off and consequent washing away of the topsoil. It also exposes the soil to the dangers of gully erosion which was observed to have rendered certain potential farmland unproductive. Also, biodiversity loss naturally leads to a reduction and possible disappearance of some species of wildlife and aquatic life. This poses danger to the future generation of the area because the loss of wild and aquatic life affects ecosystem balance which may aggravate climatic and other environmental problems such as global warming, flooding, desertification, etc. Uncontrolled exploitation of biodiversity also leads to a reduction in access to timber products. The felling of economic trees without commensurate planting of new trees is bound to have devastating consequences especially on the housing and infrastructural sectors of the economy of the area and Kwara State in general.

5.1 CONCLUSION

The paper has identified some factors influencing biodiversity loss in Ifelodun Local Government Area of Kwara State and the effects of this loss on the community and the environment. As noted earlier, the survival of any community or nation depends largely on the survival of its biodiversity. However, while recognizing the fact that the socio- economic development of a society is attached to its biodiversity exploitation, careful, diligent, and sustainable use of these resources is advocated in this paper. Therefore, to ensure the sustainability of biodiversity in the study area, the following management measures should be adopted:

- It is necessary for the Kwara State Government to create awareness among farmers and to assist them to adopt sustainable agricultural practices. The use of chemical fertilizer should be discouraged while the adoption of organic fertilizer should be encouraged. The new-found technology of converting organic waste to fertilizer and the growing number of organic fertilizer manufacturing companies in Nigeria will create an impetus for adopting organic fertilizer by the farmers. The State Government can equally partner with the private sector to establish organic fertilizer plants in the state because from our observations, there is an abundance of organic waste in most towns and cities in the state to serve as major raw materials for these fertilizer plants.

- Also, grazing activities should be strictly controlled through the establishment of grazing reserves in the area and Kwara State in general. There should be periodic shifting from one reserve to another to avoid over-grazing.
- There is a need for the community to constitute themselves into forest and wildlife vigilante groups to monitor and check the mindless exploitation of biodiversity.
- The community should also ensure that cultural practices inimical to thesustainability of biodiversity should be jettisoned for the sake of posterity. Vigorousawareness programs among the people by the government, environmental activists, and non-governmental organizations will facilitate speedy community actions inthis regard.
- Evidence from informal discussions with the officials of the Department of Forestry of the State Ministry of Agriculture suggests that only a few protected areas exist in the state while the study area was not among them. It is, therefore, suggested that the State Government should commission a comprehensive study of the existing rich biodiversity areas and the rate of biodiversity loss to identify areas of intense biodiversity loss and brings them under protection.

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