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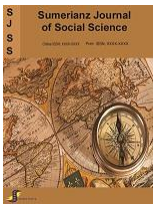

Original Article Open Access

Impact of Climatic Change on Livelihood of Rural Dwellers in Kwara State

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Abstract

Eight local government areas in Sokoto East senatorial district being the areas that are prone to the effects of climate change were purposively selected. Proportionate sampling was employed to select the villages. A total of two thousand (2000) questionnaires were administered and one thousand four hundred and ninety three returned. The data collected were subjected to descriptive statistical analysis (frequency and percentages) to analyze socio-economic characteristics of the farmers, The result indicated significant impact of climate change on livelihood such that 5.7% of people loss their lives due to flood, 18.3% of livestock were destroyed due to flood and 22.7% of the respondents agreed that livestock were destroyed due to harsh weather. 43.9% of the respondents also indicated that farm produce were invaded by birds (quelea), 40.8% showed that deforestation was the major cause of climate change, 25.1% agreed that over population was imminent in the selected LGA sampled.

Keywords: Climate change; Livelihood; Impact; Rural dwellers.

1. Introduction

In many developing countries the severe impacts of climate change, these have been noticed in several areas in Nigeria over the past decades. The most serious upshot of climate related problems have been dry spells, seasonal drought and intense rainfall leading to floods, (AAI Action Aid international l, 2006). Droughts and floods have increased in frequency, intensity and magnitude and have adversely impacted on food and water security, water quality, energy and the economic sustenance of rural communities.

The growing population of urban cities and its inverse on rural areas has put immense pressure on land and agricultural products which is a major natural resource of the people, per-capital land holding sizes has reduced and the pattern of land use have changed, in many cases leading to massive soil erosion and silting up of river systems and reduced river flow. Demand for water based products has increased beyond imagination leading to unsustainable use, (Environment Management Act, 2002).

Deforestation of traditional lands, as well as encroachment of protected areas has resulted in continued loss of plants and animal's life, at the same time it served as a central player in contributing to the menace of climate change. The agricultural sector provide numerous essential services needed for life including food, animal-feed, fibre, energy and ecosystem services (Bhorle and Ramche, 2010) but it is vulnerable to climate changes.

1.1. Susceptibility/Exposure of the Land and Rural People to Climate Change

Berkes *et al.* (2003), defined vulnerability as a characteristic of a person or group in terms of their capability to anticipate, cope with, resist and recover from the impact of natural hazard. The rural people of semi arid environments such as Kwara State which is on the edge or transition zone from the tropical rainforest region into the savanna can be described as vulnerable group that are faced with multiple impact of climate change related problem such as drought, deforestation, windstorms and flooding.

Non-climate stresses such as illiteracy, poverty, unequal access to land resources, food insecurity, social conflict, and incidence of pest and disease to man and animal can increase vulnerability to climate change by reducing resilience and can also reduce adaptive capacity because of resource deployed to competing needs. For example, the socio-economic stresses on the poor community around Mokola hills in Ibadan as result of scarcity and an increase in fuel pump resulted to indiscriminate logging of the teak plantation along the Oke-Are hill and Ogunpa river bank; clear feeling of trees on the hill for the construction of FESTAC building resulted to the floods (Omiyale) of the late seventies and early eighties in Oyo State Nigeria. When the rains came there were no tree canopies to cushion the droppings and no branching roots to break the speed of the runoff down the slope. Nigeria is faced with a number of weather and climate-related hazards, particularly floods and droughts, depending on the zone. The impacts and losses caused by these events are high because poverty and weak institutions with little capacity to prepare for and recover from these natural occurrences, IPCC International Panel on Climate Change (2001).

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2. Material and Method

The study purposively considered eight local government areas; in Kwara State which is situated between longitudes 8° and 10° north latitudes and 3° and 6° east longitudes, being the areas that are more prone to the effects of climate change. The major ethnic groups residing in Kwara State are the Yoruba, Nupe, Bariba, and Fulani. There are sixteen (16) LGAs in the state which include Asa, Baruten, Edu, Ekiti, lfelodun, llorin East, llorin West, llorin South, Irepodun, Kaiama, Moro, Offa, Oyun, Isin, Oke-Ero and Patigi. Farming is the major occupation of the people. This study was carried out in eight (8) local government areas in the state, Baruten, Edu, Ifelodun, Ilorin West, Irepodun, Kaiama, Moro and Patigi. The number of villages and households in each local government are not the same, therefore thirty percent of the villages in each local Government were proportionately selected. A total of 2000 questionnaires were administered. Primary and secondary data were collected, the primary data were collected from field survey, Structured and open ended questionnaires were used to collect data on the socio- economic characteristics of the farmers, impact of climate change on livelihood, The data collected were subjected to descriptive statistical analysis (frequency and percentages) to analyze socio- economic characteristics of the farmers. The Prism Graph Pad 6 was used for the analysis.

3. Results and Discussion

3.1. Socio-Economic Characteristics of the Respondents

Table 1a below showed that majority of the respondents in five LGAs (Edu, Moro, Barutin, Ifelodun and Patigi) surveyed were male with Patigi having the highest (89.9% male) and (10.1% female). The figures in three LGAs Irepodun, Kaiama and Ilorin south are relatively close in male, female ratios with Ilorin South recording (54.2% males) and (45.8% females). Respondents within the age range of 19-28 years showed the highest percentage of people engaged in farming (Irepodun 45.8% and Patigi 45.5%). Ages < 18years and 49 > recorded the lowest number of respondents (Ilorin south and Patigi 3.4% respectively). A total of 971 (68.2%) of respondents

Table-1. Socio-economic Characteristics of the Respondents (BIODATA)

	Gender		Age					Religion	
	Male	Female	< 18	19-28	29-38	39-48	49 >	Christianity	Islam
Edu (195)	165 (84.6)	30 (15.4)	20 (10.3)	34 (17.4)	92 (47.2)	25 (12.8)	20 (10.3)	65 (33.3)	130 (66.7)
Irepodun (180)	160(88.9)	20 (11.1)	19 (10 6)	36 (20)	61 (33.9)	29 (16.1)	31 (17.2)	135 (75)	45 (25)
Moro (185)	161 (87)	24 (13)	18 (9.7)	35 (18.9)	85 (45.9)	22 (11.9)	20 (10.8)	45 (24.3)	140 (75.7)
Barutin (190)	170 (89.5)	20 (10.5)	25 (13.2)	30 (15.8)	99 (52.1)	21 (11.1)	14 (7.3)	41 (21.6)	149 (78.4)
Ifelodun (183)	120 168 (91.8)	15 (8.2)	20 (10.9)	31 (16.9)	36 (19.7)	50 (27.3)	45 (24.6)	101 (55.2)	82 (44.8)
Kaiama (191)	170 (89.0)	21 (11.0)	27 (14.1)	35 (18.3)	94 (49.2)	26 (13.6)	15 (7.9)	47 (24.6)	144 (75.4)
Patigi (190)	165 (86.8)	25 (13.2)	25 (13.2)	35 (18.4)	83 (43.7)	28 (14.7)	18 (9.5)	90 (47.4)	100 (52.6)
Ilorin South (179)	169 (94.4)	10(5.6)	16 (8.9)	36 (20.1)	59 (33.0)	40 (22.3)	10 (5.6)	101 (56.4)	78 (43.6)
Total (1493)	1328 (88.9)	165 (11.1)	170 (11.4)	272 (18.2)	609 (40.8)	241 (16.1)	173 (11.6)	625 (41.8)	868 (59.1)

engaged in farming in all the LGAs are male. This indicated that male dominates agricultural workforce in the study area. Majority of the respondents sampled 812 (51.1%) practice Islam with animist background. It was observed that the population of seven out the eight local governments sample was dominated by Muslims, only Barutin LGA showed a result with a higher Christian population 149 (78.6%) compared with 41 (21.4%) Islam. This agrees with Adedoyin *et al.* (2005) who reported that males dominated the agricultural workforce in Nigeria. The high proportion of male to the female workforce in agriculture may be attributed to the socio-cultural belief of the rural dwellers who believe that farming is an occupation exclusively reserved for the male gender and useful for homemaking. It could also be due to the fact land ownership and inheritance in a typical Nigerian socio-cultural set up is exclusively for the male child. The female gender, therefore, finds it difficult to acquire land on a substantial quantity which could be used for farming. Religion and its beliefs also play crucial roles in the livelihoods of the study area and is a factor limits females from inheriting large portions of land which could be used for agriculture. For instance, males who are mostly household heads, have more access to land and participate more in outdoor activities than females.

Yield obtained by the farmers ranged between 233-230000 kg of produce per hectare. About 61.8% of the farmers harvested 200 to 4000 kg, 13.2% harvested 4001 to 8000 kg, 11.2% harvest 8001 to 12000, while others recorded 20,001 to 23000 kg of yield per hectare. Low level of education, farm size and low income in the selected communities could have contributed to the peoples inability to adopt to changes / knowledge on climate change thereby leading to vulnerability.

Table-2. Human activities affecting Climate change in sampled areas

	Human Activities					Vegetation Type			Other Activities		
	Charcoal	Building	Farmland	Industries	Livestock	Woody Perennials	Shrubs	Grassland	Pest	Diseases	Bush burning
Edu (195)	35 (21.1)	31 (18.7)	70 (42.2)	10 (6.0)	20 (12.0)	20 (12.0)	40 (24.1)	105 (63.9)	113 (68.1)	33 (19.9)	20 (12.0)
Irepodun (180)	74 (44.6)	28 (16.9)	53 (31.9)	11 (6.1)	11 (6.6)	24 (14.5)	54 (32.5)	88 (53.0)	79 (47.6)	57 (34.3)	30 (18.1)
Moro (185)	31 (44.3)	61 (32.8)	16 (22.9)	-	23 (32.9)	11 (15.7)	20 (28.6)	39 (55.7)	16 (22.9)	9 (12.9)	45 (64.3)
Barutin (190)	90 (54.2)	13 (7.8)	43 (25.9)	-	10 (6.0)	11 (6.6)	110 (66.3)	45 (27.1)	8 (11.4)	16 (22.9)	45 (65.7)
Ifelodun (183)	36 (21.6)	71 (42.5)	35 (21.0)	5 (3.0)	20 (12.0)	42 (25.1)	50 (29.9)	75 (44.9)	71 (42.5)	54 (32.3)	42 (25.1)
Kaiama (191)	58 (47.9)	27 (19.0)	19 (13.4)	2 (1.1)	15 (10.5)	35 (24.6)	23 (16.2)	84 (59.2)	10 (7.0)	13 (9.2)	119 (83.8)
Patigi (190)	85 (47.8)	52 (29.2)	23 (12.9)	2 (1.1)	16 (9.0)	9 (5.1)	100 (56.2)	69 (38.8)	110 (61.8)	47 (26.4)	11 (6.2)
Ilorin South (179)	90 (50.3)	62 35.0)	8 (4.5)	15 (8.4)	2 (1.1)	46 (25.0)	54 (36.5)	77 (43.5)	55 (31.1)	77 (43.5)	45 (25.4)
Total 1493	499 (27.4)	345 (23.1)	267 (17.9)	45 (3.1)	117 (7.8)	198 (13.3)	451 (30.2)	582 (39.0)	462 (30.9)	306 (20.5)	357 (23.9)

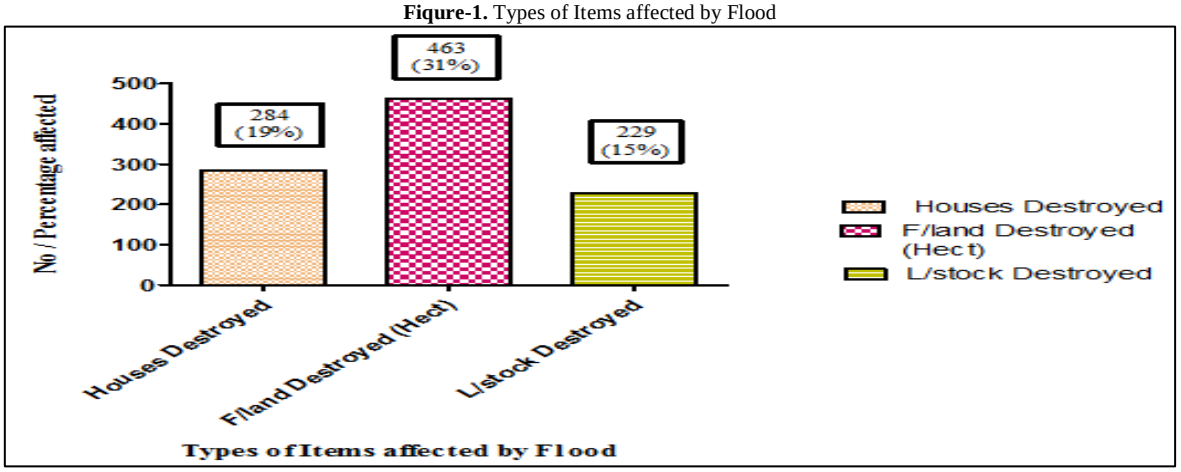
3.2. Impact of Human Activities on Vegetation and Livelihood of the Sampled areas

Result from table 2 above showed that human activities are agents of climate change and impact negatively on the livelihood of the sampled areas. Logging for charcoal and building is very high contributing to over 50% loss of vegetation. Land clearing for farmland and livestock grazing take up 384 (25.7%). Clearing for industry is very low indicating that these communities are predominantly rural or neglected by government presence. Human activities due to climate change contributed to decline in soil fertility, water cycle in the communities has been affected by climate change, high temperature have led to surface evapotranspiration from plants and land surface. This agreed with UNFCC report 2007 which stated that the removal of part of the forest or vegetation cover in a given region results in much moisture loss. This could lead to drier weather, as it could be inferred from the result of the respondent about forty percent of the vegetation in this area is turning to grassland. This invariably has led to reduction in the productivity of both the tree and agricultural crops. At extreme dryness a lot of trees and other plants will die leaving the soil open and vulnerable to the desiccating effects of sun and soil erosion which collectively reduce the nutrients content of the soil. Trees serve as carbon sink because they utilize CO_2 in the physiological process of photosynthesis, carbon compounds like carbohydrates are synthesized through the process but when the trees died and decayed or are cut and burnt the carbon contents are released either into the soil or atmosphere and the process continues but is broken when the trees are adversely affected by climatic variables. Laurance (1999) reported that when forests are cleared, the carbon is released as CO_2, it leads to an increase in the atmospheric CO_2 concentration. CO_2 is the major contributor to the greenhouse effect. According to IPCC International Panel on Climate Change (2001), the effects of climate change can reduce agricultural production, worsen food security, increase flooding and drought spreading diseases and increased risk of conflicts over scarce land and water resources.

3.3. Impact of Flooding on Livelihood

Fiqure 1: showed that 284 (19.0%) housing units belonging to some of the respondents or their neighbours have been destroyed due to the effect of heavy flooding, 463 hectares approximately (31.0%) of the respondents interviewed reported loss of farmlands to flooding, while 229 (15.3%) pointed out that their livestock were affected by flood. This indicates that flooding is rampant in the sampled areas and its effect is a menace to bo both man and his livelihood. It was reported by Darkoh (1998) that valuable properties including houses, agricultural products, and livestock were lost due to flooding. According to Yakubu and Yakubu (2008) change in climate as a result of increasing temperature has brought about increasing water bodies in Sokoto state (flood). Annual flood are commonly experienced along the Sokoto Rima river, and farmlands and houses are submerged, this also lead to tree and agricultural crop failure.

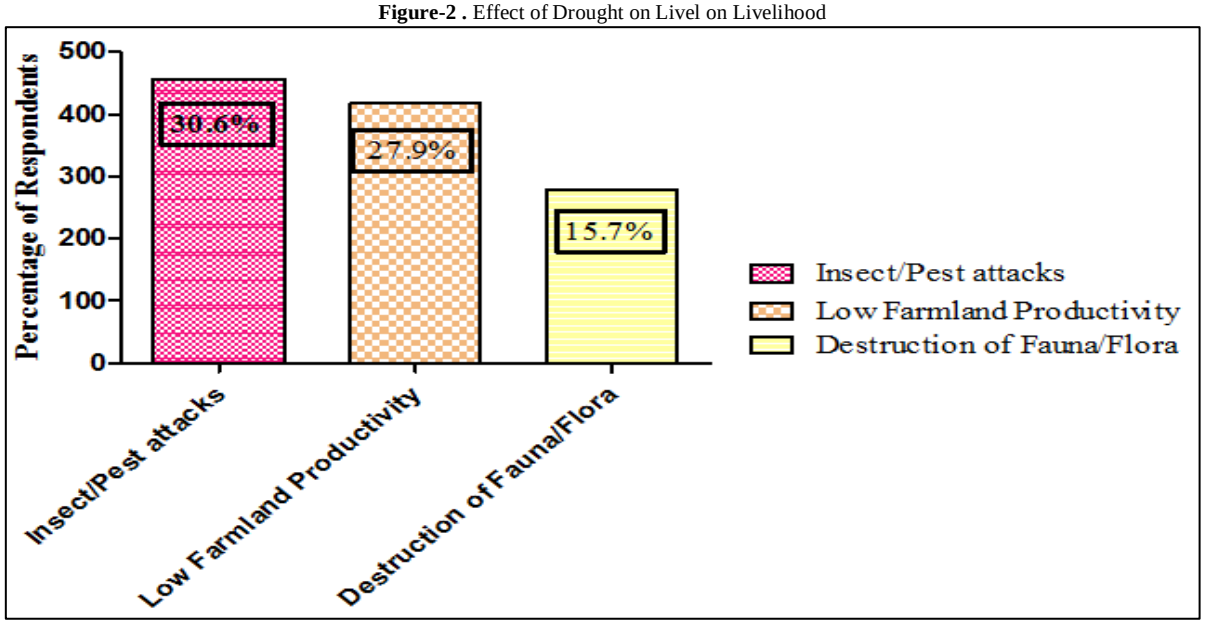
Fiqure-1. Types of Items affected by Flood



3.4. Effect of Drought on Livelihood of the Communities

30.6% of the respondents reported that the increased insect attacks are the major effects of drought on farm products (figure 2) this could be attributable to the dry condition that favours rapid development of some insects (e. g caterpillar). 15.7% of the respondents believed that destruction of fauna and flora was aggravated by drought, while only 27.9% of the respondents agreed that low productivity of farmlands was caused by drought. This indicates that increased insect attack brings destruction on productivity and economic livilihood. This agrees with NIMET report (2001) which observed in Borno state (Maiduguri) from 1960-1999 that drought threatened agricultural and forestland areas of Nigeria. The persistent droughts have often times resulted in famine in the northern Nigeria, for instance during the drought of 1972-1973, about 300,000 animals died and farm yields dropped by 60%.

Figure-2 . Effect of Drought on Livel on Livelihood

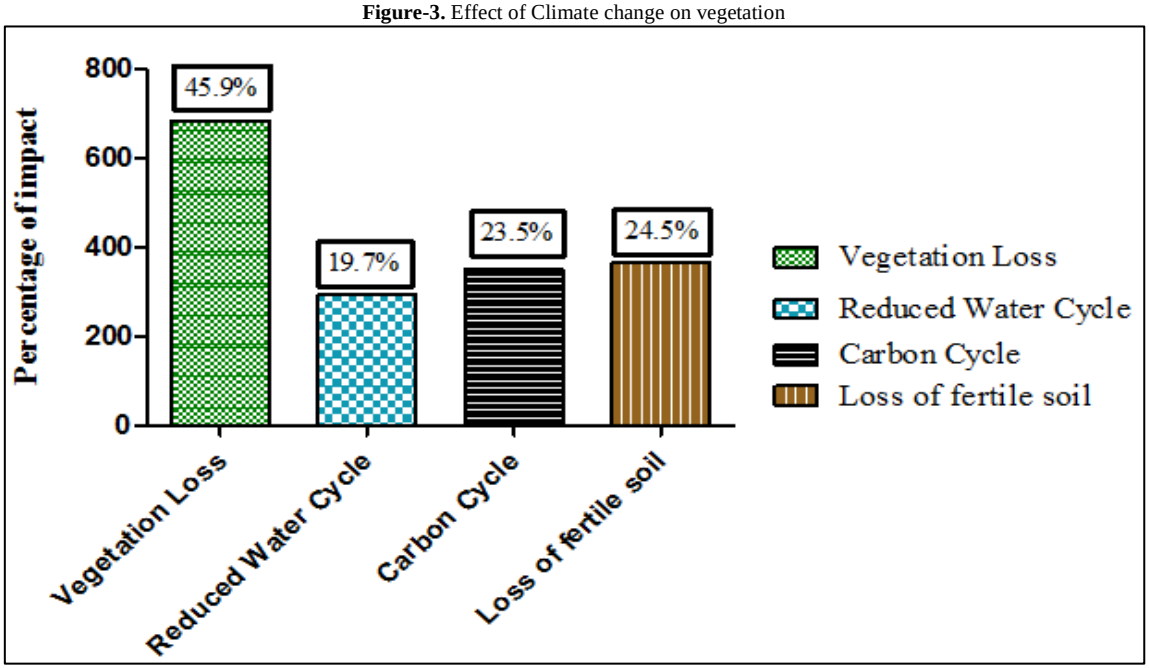


3.5. Threat of Climate Change

The result showed that 36.1% of the respondents believed that threat of climate change was more on health, the changes affect people's health as evidenced by widespread diseases such as malaria and high blood pressure. 16.4% of the respondenst showed that food supply/agriculture is more threatened by climate change, 11.3% believed that fuelwood availability is affected by climate change, while 4.0% and 34% of the respondents respectively repored that agrobusiness and biodiversity are also threatened by climate change in the study area (Fiqure 3). According to AAI Action Aid international l (2006)), difference in weather conditions in a day or over a year influence seasonal rainfall patterns and temperature levels. These changes often times lead to droughts and incessant rainfall, thereby affecting people's cropping patterns and agronomic calendars.

3.6. Effect of Climate Change on Vegetation

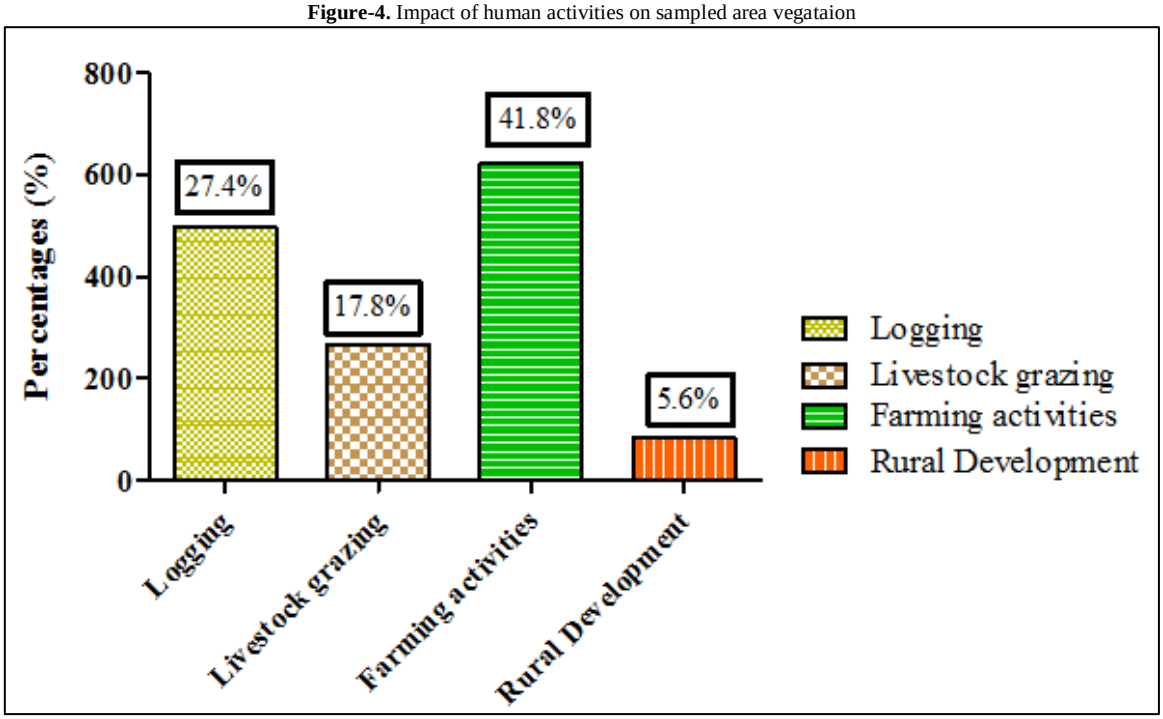
Figure-3. Effect of Climate change on vegetation



3.7. Causes of Climate Change

The result showed that 40.8% of the respondents mentioned that deforestation is the major cause in the area (Figure 4). Another 25.1% thought that over population is the leading cause of climate change in their communities, 21% believed over grazing causes climate change, while only 12% of the respondents opined that poor management of soil is the major cause of climate change in their area. This implies that deforestation generally increases the rates of soil erosion by increasing the amount of run-off and reducing the protection of the soil through the litter fall. According to UNFCC (2007) deforestation has negative effects on the environment; the most drastic impact is the loss of habitat for millions of species. Seventy percent of the earth's land animals and plant live in the forest and many cannot survive deforestation that destroyed their homes.

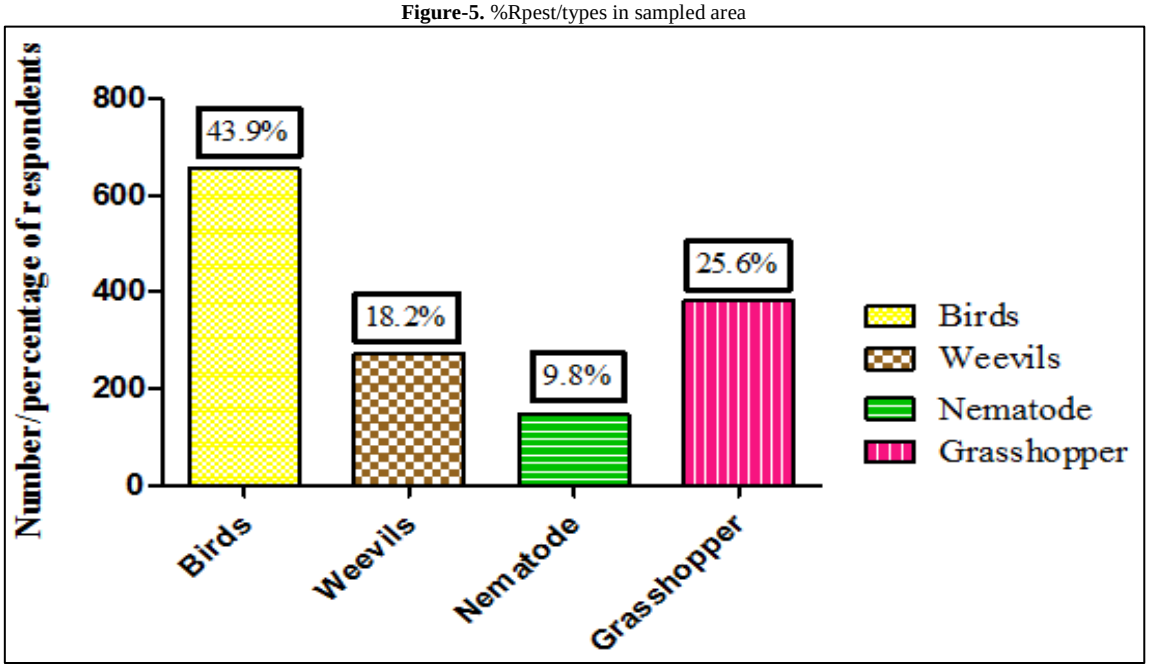
Figure-4. Impact of human activities on sampled area vegataion



3.8. Types of Pests Introduced

Climate change had led to various forms of crops infestations thereby reducing the quality and quantity of crops produced. As shown in Fiqure 5 below, 43.9% of the respondent opined that birds affect the production of crops, 18.2% of the respondent said weevils affect crop production right from the field to the store, 9.8% mentioned that nematode affect their farm produce, while 25.6.0% of the respondents showed that grasshopper affect crop production. According to Darkoh (1998) bird has more destroyed agricultural and forest resources. Quelea birds have added pressure on the already fragile ecosystem. According to one of the respondents, he had lost more than 100 bags of grain to invasion of quelea birds in the past five years.

Figure-5. %Rpest/types in sampled area



4. Labour

Most of the farmers (72.1%) spent ₦ 3000-200,000, 12.6% spent 201,000-400,000, 8.9% of the farmers spent 401,000- 600,000 to carry out farming activities yearly (Fiqure 5).This indicates that majority of the respondents spent little amount on labour to carryout their farming activities.This finding implied that the study area was dominated by small scale farmers as categorized by Reddy *et al.* (2004) who reported that majority of the farmers spent little amount to carryout farming activities due to small size of land and therefore labour is grossly underutilised. The relatively small farm sizes could imply that the farms could be easily and properly managed without employing much labour.

5. Conclusion

The result indicated significant impact of climate change on livelihood such that many people loss their lives due to flood, livestock were destroyed due to flood and livestock were destroyed due to harsh weather. The respondents also indicated that farm produce were invaded by birds (quelea), deforestation was the major cause of climate change, and why some agreed that over population was responsible.

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