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Perspectives of Farming Communities on Impact of Desertification and Climate Change on Woody Vegetation in Semi-Arid Areas of Katsina State

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Abstract
Semi-arid environment of Nigeria has been identified as an area highly vulnerable to climate change and desertification than other ecological zones of the country and the local people's perception of biodiversity are vital source of information on pattern of vegetation changes. This study investigates the local perception of impact of climate change and desertification on woody vegetation in northern Katsina state, Nigeria. Data were collected through questionnaire administration, focus group discussion, and key informants interview. Majority of the respondents in the six study villages of the three local governments reported late onset, early cessation, decreased duration of rainy season and increasing incidence of dry spell. More than 80% of the sampled farming communities reported increasing intensity of temperature and the number of hot days. These changes had adversely affected the availability of plants biodiversity in the area particularly woody vegetation which the villagers attributed to increasing population pressure and largely to the changing pattern of climatic elements particularly rainfall and temperature. More than 75% of the woody vegetation mentioned by farmers was classified as decreased or disappeared. Findings from this study could be used as baseline information for conservation of species identified to be declining or disappearing in the study area.

Keywords: Climate change, Desertification, Woody vegetation, Semi arid, Farming communities

Introduction
Nigeria is a large country with a substantial part of its area extending into the Sudano-Sahelian belt, located between 11^0N and 14^0N which is about 40% of the country's landmass that is highly susceptible to desertification than any other region of the country due to a variety of factors, including overgrazing, deforestation, wind erosion, soil depletion aggravated by continuous cropping, drought and bush fire (Adegbehin et al., 1990; Mijindadi and Adegbehin 1991; Medugu, et al., 2011). The rate of land degradation in Nigeria appears to have extended below 11^0N because of uncontrolled human activities (Otegbeye, 2004). It has been estimated that Nigeria is losing 350,000m^2 to desertification every year and the Sahara desert is advancing at an estimated rate of 0.6km per year (Medugu, et al., 2011).

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Apart from desertification problems many studies in Nigeria reported manifestation of climate change in different parts of the country. Climate change (CC) refers to a change in the pattern of climate that can be assessed by change in the mean and/or the variability of its properties, and that persists for an extended period typically decades or longer (IPCC, 2007a). Example, Odjugo (2010) indicated that the mean temperature in Nigeria between 1901 and 1938 was 26^{o}C. While the mean between 1971- 2008 was 27.83^{o}C which indicates a mean of 1.70^{o}C for the period, more than the global mean temperatures rise of between 1906 and 2005 (0. 74^{O}C). He maintained that if these trends continue unchecked, Nigeria may experience between the middle (2.5^{O}C) and high (4.5^{O}C) risk temperature increase by the year 2100. According to the Intergovernmental Panel for Climate Change [IPPC] (2007b), increase in global average temperature above the range of 1.5- 2.5°C may result in significant changes in the structure, function and geographical ranges of ecosystems, which may negatively influences species distribution and survival. In Katsina state, rainfall records (1941-1970) analyzed by Tomlinson (2010) from more than 120 stations extending between 9^{o} to 13.5^{o}N, 7^{o} in present Kaduna and Katsina states indicate reduction in the amount of rainfall received in the study area from 700mm in 1970 to less than 600mm in 2008**.** He indicated that if the downward trends persist the amount of rainfall in northern Katsina state will decrease from 700mm in the 1970 to less than 400mm by the year 2030 and further maintained that the general effect of rainfall variability on the environment is "woodland becoming thorny shrub and savanna becoming desert, with sustain rain fed agriculture becoming unviable." Many studies (e.g. Sop and Oldenland, 2011a; Sop et al., 2011b; Sop et al., 2012) indicated that vegetation plays an important role in everyday lives of rural population providing livestock with fodder, firewood, timber, traditional medicine and many other products that are used locally or sold to generate income. Hence any change in vegetation can have significant impact on the quality of life of the local people including their health, nutrition and household income.

However, studies largely based on interpretation of remotely sense data have documented vegetation recovery as indicated by increase in Normalize Difference Vegetation Index (NDVI) in semi arid areas of West Africa (e.g.,Eklundh and and Olsson, 2003; Herrman *et al*., 2005; Anyamba and Tucker,2005). But studies on local knowledge on vegetation changes in sudano-sahelian region of West Africa consistently indicated wide spread decline and extinction of some plant species (e.g., Wezel and Haigis, 2000; Lykke, 2000; Wezel and Lykke, 2006 Sop and Oldeland 2011; Sop *et al.,* 2012; Spiekerman *et al.,* 2015). Some scientists reported improvement in the vegetation condition as a result of increase in rainfall trend (e.g. Eklundh and Olsson, 2003; Nicholson, 2005). Others linked the improved vegetation condition not only to increase in rainfall but also to changes in land use and management practices particularly in Burkina Faso (West *et al.,* 2008) and Niger (Reij *et al.,* 2009; Binam, 2015).

These conflicting research results necessitate the need to make thorough investigation with evidence from the local knowledge along the border in Nigeria very close to area studied by Wezel and Haigis (2000) in Niger republic to see whether the claimed vegetation improvement particularly woody vegetation as claimed by some scientist is also experienced there. Local knowledge is widely believed to be useful and reliable data source on historical distribution pattern of plants particularly rare and endangered species which are difficult to assess using sophisticated equipment (spiekerman, 2015) Understanding local knowledge of native plant species can guide the choosing research priorities for better management of vegetation resources. Ethno botanical knowledge has been proved to be relatively accessible and reliable

source of information on vegetation dynamics and can provide important information about single species, which can be used for local resource management (Sop et al., 2012).
Thus, the overall objective of this study was to get the perspectives of the farming communities in northerner Katsina state on the impacts of climate change and desertification on woody vegetation.
The specific objectives are; to get the perspectives of the farmers on changes in the pattern of rainfall and temperature and to examine how these changes in the above climatic elements influence desertification and affect the availability of woody vegetation

MATERIAL AND METHODS

The study area

The study area is located between latitude 12^{o} 52'N and13^{o} 19'N and longitude 7^{o} 16'E and 8^{o} 43'E. The area is characterized by unimodal rainfall pattern with most of the rain received between May to September, annual average below 700mm.Temperatures are high in most parts of the year with the mean daily maximum ranging between 27^{o}C to over 40^{o}C occurring between March and May. The mean minimum ranging between 18^{o}C to 25^{o}C experienced in the month of November to early February The area has four different seasons; a cool dry season (December to February), a hot dry season (March to May), a warm wet season (May to September) and a season of falling temperature (September to November), (Tomlinson, 2010). The landscape is underlain by sedimentary rock, flat with an average of 300 meters above sea level, broken in some parts by hills. Trees and grasses adapt to climate rhythm of long dry season and short wet season. Most trees developed long tap roots, thick bark which enable them to withstand the long dry season and bush fires). The soils are sandy ferruginous type of the latosols group which is highly weathered and markedly laterised and slightly acidic in reaction to low organic matter content and phosphorous, its total nitrogen rarely exceed 0.2%. (Abubakar, 2006). The vegetation is subjected to various form of abuse which includes fire, wood cutting, cultivation, overgrazing and bush fire. The subsistence rainfed farming is the common economic activity in the area and fragmented farm land form the dominant feature of the land use pattern. Figure 1 is the map of the of the study area within Nigeria and Katsina state, the shaded area very close to the Nigeria and Niger Republic border are the location of the selected local government under study.

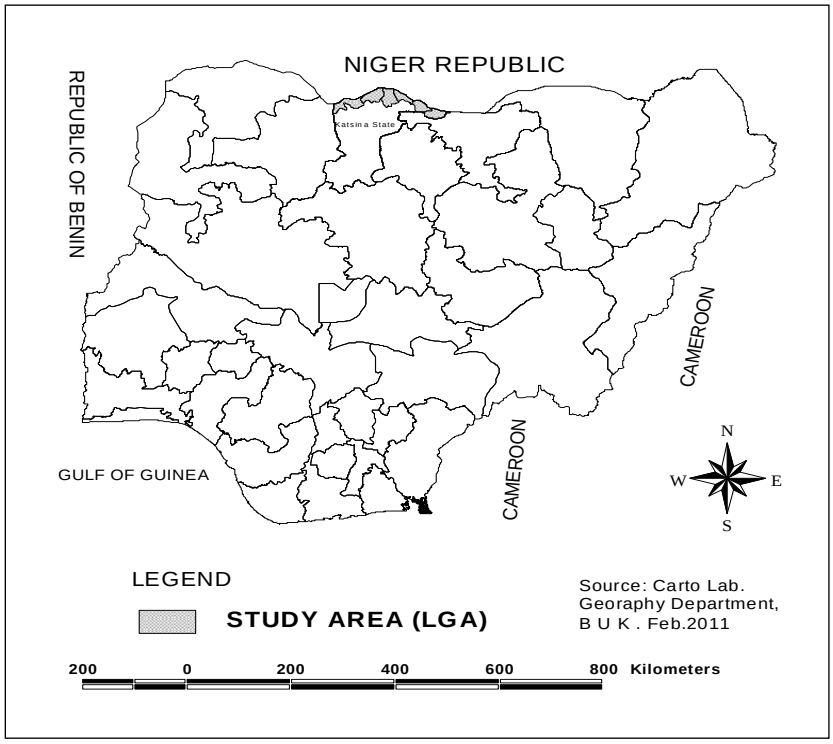

Figure 1 : Study area shaded within Nigeria and Katsina state

Table 1 : **Sample Sizes and Some Characteristics of the Study Area**

Local Govt.	Villages		Location (Coordinate)	Estimated Population	No. of Sample Selected in the village	No. of Sample selected in the Local Govt.	Dominant tribe
Maiadua	1	Bumbum	13^{0}16'N, 8^{0}07'E	1,700	17	39	Hausa/Fulani
	2	Kwangwalam	13^{0}10'N, 07^{0}32'E	2,200	22		Hausa/Fulani
Mashi	1	Birnin Kuka	13^{0}19'N, 07^{0}59'E	3,200	32	57	Hausa/Fulani
	2	Majigiri	13^{0}15'N, 07^{0}53'E	2,500	25		Hausa/Fulani
Zango	1.	Yakubawa	13^{0}04'N, 08^{0}29'E	1,800	18	40	Hausa
	2	Yardaje	13^{0}01'N, 08^{0}34'E	2,200	22		Hausa/Fulani
Estimated Population and Samples sizes respectively				11,600	136	136	

Sources: Field Work (2018)

Data collection

Twenty respondents were randomly selected in a pilot survey conducted in order to identify potential problems associated with the interpretation and administration of the questionnaires. This allowed for restructuring and paraphrasing of questions and devised ways of minimizing all questionnaire-related problems before the actual data collection.

Sampling technique with proportionate representation was used to determine sample size. A total of 136 respondents were purposively sampled in the order of 57 in Mashi, 40 in Zango, and 39 in Maiadua local government areas as shown in table 1. Respondents who were aged 50 years and above; and lived in the study area and can recall temperature and rainfall patterns and desertification progression in their communities for decades were purposively given priority following Wezel and Lykke, (2006). To get information on farmer's knowledge of the climate change in their immediate environment, farmers were asked about their methods of estimation of rainfall, temperature, the date of rainy season i.e. onset and cessation. Farmers were also asked to compare the pattern of rainy season(s) in present days with past when they were young, to determine if there are changes in climate. If there are changes, the farmers were then asked to mention the time of the start of the change referring to a year, or any important event which the farmers could remember. (Mkonda and Xinhua, 2017). Farmers were also asked if the rainfall onset / cessation was now early, late or remained unchanged compared to the past time; if the number of rainfall events or dry spells have decreased, increased or stay unchanged; if temperature, that is the number of hot and cool days in the past years have decreased, increased, or remained unchanged; open-ended questions were also used to get the perspectives of the farmers on any other indicators of climate change and menaces of desertification in their localities which they have not mentioned.

To examine how the changes in rainfall and temperature and impact of desertification affect the availability of woody vegetation, the following activities were pursued to achieve the objectives

(i) A transect walk with selected respondents was carried out. But preference was given to those who are 50 years and above, following Wezel and Haigis (2000) and Wezel and Lykke (2006),

(ii) (ii) Questionnaire was administered with purposively selected farmers and pastoralists who are 50 years and above. The questions covered several topics related. In general, the respondents were asked to mention plant species and qualify their present occurrence compared to the past following four criteria indicating woody vegetation which:

  (a) Increased
  (b) Decreased
  (c) Disappeared.

(iii) After the questionnaire administration, Focus Group Discussion were held which involved dialogues with group of respondents selected from among the local people who participated in the transect walk in the villages, and government officials in charge of forestry. The findings from the household survey were presented to the group for discussion. This allowed the researcher to make comparison between locally held views and the official sentiment on vegetation, whether it increases or there are newly introduced species or the vegetation is decreasing, or some species are disappearing.

The identification of Botanical Name of Plants

To identify the botanical names of each of the mentioned species, their local names given by the farmers and pastoralists, and characteristics in terms of flower, root system, body morphology and local name, were compared with the details given by Blench (2004) Where the names and characteristics were found to correspond with that of the above author, the botanical names given by the author were adopted as names for the plants identified. However, some plants particularly that disappeared could not be identified and named through the above mentioned method. Hence, their specimens were obtained from other ecological zones (Sudan or Guinea savanna) where they are available with the help of the local famers/pastoralists. The specimens were taken to the Herbarium of the Department of Biological Sciences, Ahmadu Bello University, Zaria where they are identified and named.

DATA ANALYSIS

Descriptive statistics was used, analyzed by SPSS software to generate cross tabulations and frequency tables.

Results and Discussion

Agriculture is the main occupation of the population, providing the mainstay of the economy. Majority of the respondents (more than 80%) in five local government areas except Mai adua (70%) were farmers. For those who engage both in crop production and livestock rearing, livestock is seen as an inseparable complements to successful farming. Table 2 shows the demographic characteristics and occupation of the respondents. An important off-farm activity of the younger men is migration to neighbouring urban centers or to other parts of the country.

Table 2: The Demographic Characteristics of the Respondents

	Mashi (n=57)		Zango (n=40)		Maiadua (n=39)	
	Frq.	%	Frq.	%	Frq.	%
Gender						
male	51	89	38	95	37	95
Female	06	11	02	05	02	05
Age						
10-20	00	00	00	00	02	05
21-30	07	12	06	15	03	08
31- 40	05	09	04	10	11	28
41-50	10	18	15	37	07	18
51-60	17	29	08	20	06	15
61-70	07	13	02	05	05	13
71-80	06	10	03	08	02	05
Above 80 years	05	9	02	05	03	08
Occupation						
Farming	32	82	46	81	28	70
C/ Servant	02	5	03	05	05	12
Trading	04	10	02	04	05	12
Other	07	03	06	10	02	06

Source: Fieldwork (2018)

The domination of farming as the major occupation in the study area reflects the importance and value attached to land. The pattern of land tenure has been playing on important role in agricultural production in the area. Hence, an examination of farming practices is critical to any study on man-land interrelationship as well as in understanding the land degradation process in the area.

It has been found that land tenure in the area has a double ancestry, i.e the traditional concept of communal landownership and Islamic law, which recognizes individual tenure. This was reflected in the pattern of land ownership, as shown in table 3. It has been found that majority of the respondents got their land through inheritance in Zango (70%). The pattern of land ownership (largely through inheritance) clearly indicated widespread land fragmentation and the small size of farmlands, on the average 1.5 hectares was found in Mashi and 1.3 hectres in Mai'adua. While those who own land through forest clearance (owners) were dominantly elderly people. Despite the small size of the respondents' land, most of them felt that the land tenure system is fair to all and land acquisition is not a problem; as long as one has the means of investing in the land, it is easy to get land free or for little rent for crop production.

Table 3: Land Tenure and farm land size.

	Mashi (n=57)		Zango (n=40)		Maiadua (n=39)		Average %
	Freq.	%	Freq.	%	Freq.	%	
LAND TENURE							
Owner							
Inherited	14	25	11	27	10	26	26
Purchased	37	65	28	70	25	64	66
Others	06	10	01	2.5	03	8.0	06
	0.0	0.0	00	00	01	2.6	01
Average Farm Size Hectres	1.7		1.4		1.3		1.5

Source: Field Work (2018)

Farmers' perception of climate variability and change

Majority of the farmers believed that there had been changes in the overall climate pattern. However, there was little variation between the 6 villages concerning the time these changes had begun to manifest. Most of the farmers in the villages believe the changes in climate to have started between 15-30 years ago, while the minority mentioned less than 10 years ago.

Table 4: Farmers' perceived changes in the rainy season pattern in northern Katsina state

SPECIE NAME		MASHI LGA. n=57		ZANGO LGA n=40		MAI'ADUA *LGA n=39*	
		Frequency	%	Frequency	%	Frequency	%
Rain onset	Early	07	13	04	10	01	02
	No change	03	05	03	08	06	15
	Late	47	82	33	82	32	83
Rain cessation	Early	45	80	32	80	28	72
	No change	04	07	05	13	06	14
	Late	08	13	03	07	06	14
Season duration	Decreased	50	88	35	88	32	83
	No Change	03	05	02	05	06	15
	Increased	04	07	03	07	01	02
Heavy events	Decreased	40	70	30	75	30	77
	No change	10	18	02	05	03	08
	Increased	07	12	08	20	06	15
Dry spell frequency	Decreased	03	05	05	12	04	10
	No change	14	25	03	07	06	15
	Increased	40	70	32	81	29	75
Total amount	Decreased	50	88	35	88	35	90
	No change	02	03	02	05	02	05
	Increased	05	09	03	07	02	05

Source: Field work (2018)

Changes in rainfall pattern

The onset of the first rain in the season of the year was perceived by farmers to be starting late nowadays than before (Table 4). On the other hand the cessation of rainfall was mentioned to be earlier. These two perceptions were consistent with the perceived shorter season duration observed in Burkina Faso by West et al., (2008).

The late onset of the first rainy season and the earlier cessation were reported by a higher proportion of farmers (more than 80% and 70% - 80% respectively) in all the sampled villages. The season duration were perceived to have decreased by more than 80% of the respondents and the number of rainfall events have decreased consistently with the number of dry spells perceived to have increased.

Table 5: Farmers' perceived changes in temperature in northern Katsina state

		MASHI LGA. n=57		ZANGO LGA. n=40		MAI'ADUA LGA n=39	
		Frequency	%	Frequency	%	Frequency	%
Temperature	Decreased	06	11	04	10	02	05
	No change	03	05	03	08	03	08
	Increased	48	84	33	82	34	87
Number of hot days	Decreased	06	11	03	07	10	25
	No change	05	09	07	18	03	08
	Increased	46	80	30	75	26	67
Number of cool days	Decreased	45	79	32	80	20	51
	No Change	08	14	02	05	07	18
	Increased	04	07	06	15	12	31
Hottest month	Change	40	70	27	68	15	38
	No change	17	30	13	32	24	62
Coolest month	Change	46	80	27	68	25	64
	No change	11	20	13	32	14	36

Source: Field survey (2018)

Changes in temperature pattern

The farmers were asked for observed changes in temperature, length of cold periods and length of dry period in order to determine their level of perception. The results of farmers perception of temperature is presented in table 5. It indicates that the number of hot days had increased but it had reduced during the rainy season periods. More than 80% of the surveyed farmers in the three local government have observed increasing temperature while only an insignificant 11% in Mashi local government noticed a decreased in temperature, and 8% of the respondents in Zango and Maiadua local governments reported temperature remain unchanged.

The result also indicates a reduction in the number of cold days and an increase in the number of extreme hot days in the study area. It also implies that farmers' perception of an increase in temperature is mainly due to extreme temperature events and a decrease in the number of cold days compare to the past.

Impact of climate change on woody vegetation

It was observed that the study area has useful indigenous plant species scattered within the crop fields and rangeland and forest reserves. However, these vegetation resources are undergoing persistent changes due to natural and human influence. Trees form a striking component of the farmland in northern Katsina state (Lawal, 2012). This land use system is commonly known as the agroforesty parkland system and has been successively described by Pullan (1974) as farmed parkland, Most of the trees and shrubs in the area have fine leaves, with sparse grasses and herbs, some having a thorny and short structure. Average height of 6.51, 2.77 and 1.18 meters have been recorded for trees, shrubs and herbs/grasses respectively in similar environment in some parts of Kano and Yobe states studied by Mohammed (1994).

The study area is part of Nigeria experiencing rapid population growth (Mortimore, 2006), increasing climatic variability (Wezel and Haigis, 2000; Wezel and Lykke, 2006) an increasing demand for vegetation resources (Boatene, 1998; Odihi, 2003), particularly fuel wood, which cannot be met from the existing scanty vegetation without further environmental degradation.

The most important common woody vegetation found in the area were mentioned by the farmers and pastoralists in table 6

Table 6: Pattern of woody vegetation changes in northern Katsina state

SPECIES NAMES	MASHI L.G.A.		ZANGO L.G.A.		MAI'ADUA L.G.A	
	B/Kuka	Majigiri	Yakubawa	Yaardaje	Bumbum	Kwangwalan
Acacia nilotica	↓	↓	↓	↕	↓	↕
Acacia tortilis	↓	↓	↓	↓	↕	↓
Acacia sieberiana	↕	↓	↕	↓	↓	↕
Adansonia digitata	↕	↕	↓	↕	↕	
Albizi chevalieri	↕		↕	↕		↓
Anogeissus schimperi	↕	↓	↕		↕	
Anona Senegalensis	↕	↕	↕	↓		↓
Balanites aegytica	↓		↕	↕		↓
Bauhinia rufescens	↕	↓		↕		↓
Bauhinia thonningi (schum)		↕	↕	↕		↓
Butyrospermum – paradoxum	↓	↕	↓	↕		
Cessia sieberiana (lin)	↕		↓	↓	↓	
Commiphora africana		↕	↓	↕		↕
Fiscus phonningll	↓	↕		↕		↕
Fiscus ovata	↕	↕	↓	↕	↕	↕
Faidherbia albida	↓	↓	↓			↕
Ficus Polita	↕	↓	↓	↕	↓	
Ficus iteophylla	↓	↓		↓		↕
Hyphaene thebaica	↓	↕	↓	↕	↓	
Lannea acida	↓		↓		↓	↓
Maerua angolensis	↓		↓		↓	↓
Khaya senegalensis		↓		↓	↓	
Maerua crassifolia	↓		↕	↕		↕
Moringa oleifera	↕		↕		↓	↕
Parkia biglobosa	↓		↕		↕	↕

Phoemix dactylifera	↕	↕	↓			↓
Prosopis Africana	↓		↕		↕	↕
Ceiba Pentandra	↓	↓	↓		↕	
Sclerocarya birrae	↕		↓		↓	↕
Stereospermum kunthianum	↓	↕	↕	↕		↓
Sterculia satigera	↓	↓		↓	↓	↓
Stylosanthes errecta P. Beawx	↓	↕		↓		↕
Stryphnosa spinso	↓	↓	↓		↓	↓
Tamarindus indica	↓	↕		↕		↕
Terminalia aviccenioni des		↕	↕	↕		↕
Vitex doniana (Sweet)	↕	↓		↓		↕
Watheria americana	↓	↓		↓	↓	↕
Ziziphus microriata	↓	↕	↓		↓	↓
Zizi phus spina chisti	↓	↓	↓	↕		↕

Source: Field survey (2018)

Key: ↕ Decreasing, ↓ Disappeared, ↑ Increasing

Woody vegetation Changes in northern Katsina state

The number of woody vegetation that were mentioned to have decreased or disappeared was higher than the species that increased. More than 75% of the species listed in table 6 were either decreased or completely disappeared in the study area example, Khaya senegalensis , Lannea acida and Maerua angolensis have completely disappeared while Tamarindus indica, Parkia biglobosa and Maerua crassifolia are consistently decreasing in all the villages. Local perception of more decrease and disappearance than increase in woody vegetation conforms with earlier studies in neighbouring Niger republic close to the study area where increase in the disappearance and decline of vegetation particularly trees, was documented by Wezel and Haigis (2000) and Wezel and Lykke (2006). Local farmers attributed the decrease and disappearance of these species to a decline in the amount of rainfall received in the area and frequent drought in recent years. To prove the decrease in the amount of rainfall received in the area, the local farmers compared the amount of rainfall received with the level of the water table below the surface. They claimed that in the past 20 years the water table was less than 10 meters below the surface, but presently one had to dig a well of nearly or more than 30 meters before reaching the water table. Example, In Bumbum (Ma'adua L.G) the villagers disclosed that in the past 20 years Ficus polita and Ficus phoningll (locally called in Hausa Durumi and the chediya respectively), were the dominant trees species in the village, but all have naturally wilted and died. Not a single tree of either (Ficus polita or Ficus phoningll) could be found in the village. The villagers believed that these species disappearance is due to a sharp decline in the amount of rainfall received in the area and the increasing depth of water table which is inaccessible for the roots of these trees and water no longer remained in the stream during the

dry season for a longer time as it used to be. Farmers' claim conform with the findings of Oluwasemire and Alabi (2004); Tomlinson (2010) and Ekpho and Nsa (2011)

Apart from the climate changes, the respondents also suggested that an increase in population has contributed a lot in the use of more woody vegetation to meet the increasing demand for fuel wood and the expansion of new area for cultivation. However, case studies from other countries have revealed many instances where population growth and agricultural intensification did not lead to the degradation of natural resources (e.g. Mortimore and Adam, 2001). But it could be argued that the increase in population in the study area could necessitate the destruction of more vegetation resources because alternative energy in the form of kerosene and cooking gas were not readily available or affordable. Hence, people have to use the available source of energy (fuel wood) without thinking of the consequences. Also lack of job opportunities and a reliable source of income apart from farming have compelled many farmers to cut down shrubs in their farms and forest reserve. That is why heaps of fuel wood for sale has become a common feature along the major roads in the study area.

Conclusion and Recommendations

It can be concluded that poverty and environmental degradation in the form of deforestation are traps that are difficult for poor communities to escape from and the prevention of the degradation of natural resources is irrelevant to the present need of the poor farmers. For them survival is the most urgent issue. Thus, it is important to stress that "the integrity of the natural environment can only be assured when human integrity is assured through a strategy that ensures a well provisioned society" (Odihi 2003).

What can be observed from the list of species mentioned by the farming communities on the influence of climate change on the species survival also demonstrated that human impact must be seen also as an important contributing factor for species changes not only climate change and desertification. Many species were mentioned to have decreased or disappeared at different part of the study area; priority should be given to endangered species in local resources management. Large percentage of the species are yet to be domesticated, some of these species are very slow to regenerate because young seedlings are often graze by livestock or wiped by annual clearing of field. Hence to improve regeneration species that are increasingly threatening need to be selected and protected from livestock or field clearance which proved to be easiest, cheapest as found in successful projects in Niger republic (Wezel, 2006). Development agencies should integrate local people preference and conservation priorities in their strategies of poverty eradication projects

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