



Farmers' Perceptions of Drivers of Desertification and Their Impact on Food Security in Northern Katsina State

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ABSTRACT

Understanding local perception of desertification and its management by the local communities is critical for gaining support for remediation and restoration effort of desertified areas by the government. This study investigates the drivers of desertification and their impact on food security base on the perspectives of the local farmers of northern Katsina State. Participatory Rural Appraisal (PRA) approach, Focus Group Discussion (FGD) and questionnaire were used in the data collection. The farmers adduce desertification to the attitude of the local farmers through overgrazing, cultivation of marginal areas, bush burning among others. It was found that due to the effects of desertification large percentages of the population living in the study area are food-insecure and their condition may likely worsen if immediate and effective measures were not taken minimize the problem. It was concluded that food security has strong relationship with the national security, peace and stability of area and Nigeria in general.

Keywords: Perception, Desertification, Food security, Farmers, Northern Katsina State,

INTRODUCTION

Persistent decrease in soil and vegetation productivity as result of desertification is the major limitations to food security in semi arid environment of Africa, placing many small holder farmers in vulnerable position (Tittonell et al., 2012). Desertification is the land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities (Reed et al.,2013). It is accompanied by the reduction in productive capacity of land, loss of biodiversity, the depletion of surface and ground-water resources and has negative repercussions on the living conditions and the economic development of the people affected by it (UNCCD, 1992). Some researchers consider desertification to be a *process* of change (e.g. Davies *et al.*, 2010), while others view it as the *end result* of a process of change (e.g. Obioha, 2009). Desertification-as-process has been viewed as a series of incremental changes in biological productivity in arid, semi-arid, and sub humid ecosystems. It involve changes such as decline in yield of some crops, extinction or replacement of some vegetation species, or even a decrease in the density of the existing vegetation cover

The concept of desertification in dry land was first conceived by E.P. Stebbing in the 1930s and Aubreville in the 1940s during the colonial rule in West Africa, in response to what colonial administrators saw as unsustainable resource management by local farmers, which could eventually lead to south ward advancing of Sahara into fertile land. (Dregne, 2002). Stebbing's prognosis of 1930s on the "encroaching" Sahara desert has been echoed in many scientific reports of international organizations, such as United Nation Agencies, the World Bank, NGO reports, etcetera particularly after the 1970s and 1980s drought in Africa (Mortimore, 1989).

Nigeria's savanna region covers about 849,496km² or 86% of the country's land area and contains 60% of the country's population (Adegbehin, et al., 1990). Between 11⁰N and 14⁰N where the Sudano-Sahelian agro-ecological zone lies, is about 40% of the country's landmass which is very susceptible to desertification than any other region of the country. The rate of desertification in Nigeria appears to have extended below 11⁰N because of uncontrolled human activities (Otegbeye, 2004). However the extent and severity of desertification in most states of northern Nigeria is yet to

be fully ascertained and documented (Maiangwa et al., 2007). Nevertheless, some report indicated that Nigeria is losing over 350,000m² to desertification every year and the Sahara desert is advancing at an estimated rate of 0.6km per year (Daily Trust, 16, June 2008, quoting Minister of Environment). Also during the flag off of the Great Green Wall Project in Kebbi state in 2013, the then Minister of Environment disclosed that about 43.3% of the total area of the country is prone to desertification (Mohammed, 2015). The manifestation of this phenomenon is the gradual change in vegetation from grasses, shrubs and few trees to only few grasses and shrubs ; and in the final stage , large area of desert-like sand with little or no vegetation cover (Olagunjo, 2015). In Nigeria, the devastating impact of desertification have been increasing in an alarming rate and posing serious threat to food security, employment and the nation economy in general. Hence, Nigeria signed the United Nation Convention to Combat Desertification on 30th October 1994.(Mohammed, 2015) After the adoption of the convention agreement, Nigeria prepare and implement the National Action Programmes on desertification. Okoli and Ifeakor (2014) noted that the policy and the programmes introduced to deal with the desertification problem and enhances food security have not achieved the desired result because of the wide gap in policy formulation and strategies of combating desertification and the problem has been treated as sectoral issue instead of approaching it as an integrated one having relationship with the other sector. Northern Katsina state is an area believed to be threatened seriously by desertification (Lawal, 2012). Hence this study attempt to document what local farmers knew about causes of desertification and the effort they were making in minimizing the problem in six local government of Katsina state bordering Niger republic and its impact on food security of the local communities. Many scientists are advocating the need to consider the views and the perspectives of the local communities who may offer important revelation on their environment changes which analysis of scientific data alone can capture.(e.g Lykke and Wezel, 2006)

CONCEPTS OF DESERTIFICATION AND FOOD SECURITY

The word desert was drive from the Latin word *desertus* meaning abandoned (Mohammed,2015) Desertification has been used as a synonym for land degradation in cultivable dryland (e.g, Le Houerou, 1996; Dregne, 2002; Kiunsi and Meadows, 2007). In general terms, desertification may be defined 'as undesirable change in the state of land from productive to unproductive due to natural or man-made factors' (Kiunsi and Meadows 2007). Desertification involves the formation and expansion of degradation of soil and vegetation cover particularly in semi-arid environment (Dregne, 2002). It is also seen as denudating and degrading a once fertile land, by initiating a cyclical process that feed on itself and causing changes in soil, and vegetation of an area.(Olagunjo, 2015).

Miller (1999) view desertification as a process whereby the productive capacity of arid and semi-arid land falls by 10% or more. Miller (1999) further categorized desertification as mild, serious, or severe based on soil productive capacity. Mild desertification is drop in soil productivity from 0-25% , serious desertification is drop from 26%-50% and severe desertification is a drop of more than 50% productivity.

Food security

Food security refers to availability and accessibility to enough food by all people at all times for and active and healthy life (Okoli and Ifeakor, 2014). Lal (2009) view food security as physical, social, and economic access to sufficient, safe and nutritious food by all people at all times to meet their dietary and food preference for an active and healthy life. The World Bank.(2014) identified three important yardsticks of assessing food security, these are *food availability, food accessibility and food utilization*. This indicate that country which produces food that cannot meet these criteria is said to be food insecure.

Lal (2009) explain four important components of food security: food production through agronomic management of soil resource, stability of food production and availability at all times, food access through economic capacity of household or community and food safety through nutritious and biological equality. In semi-arid areas of northern Nigeria food security has been influence by unreliable and unevenly distributed rainfall, access to input, high inflation, food price instability, poor harvest, transportation problems among others (Mohammed, 2015)

MATERIALS AND METHODS

Profile of the Study Area

The study area is located between latitude 12° 52'N and 13° 19'N and longitude 7° 16'E and 8° 43'E. The area falls within six local government areas (Jibia, Kaita, Mashi, Maiadua, Zango and Baure) of Katsina state, northern Nigeria. The landscape is underlain by sedimentary rock, flat with an average height of 300 meters above sea level, broken in some parts by hills. (Lawal, 2012) 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 vegetation is subjected to various form of abuse such as fire, wood cutting, overgrazing etc. 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°C to 40°C occurring between March and May. The mean minimum ranging between 18°C to 25°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 soils are sandy ferruginous type of the latosols group which is highly weathered and markedly laterised and slightly acidic in reaction with low organic matter content and phosphorous, its total nitrogen rarely exceed 0.2%. (Abubakar, 2006) The subsistence rain fed farming is the

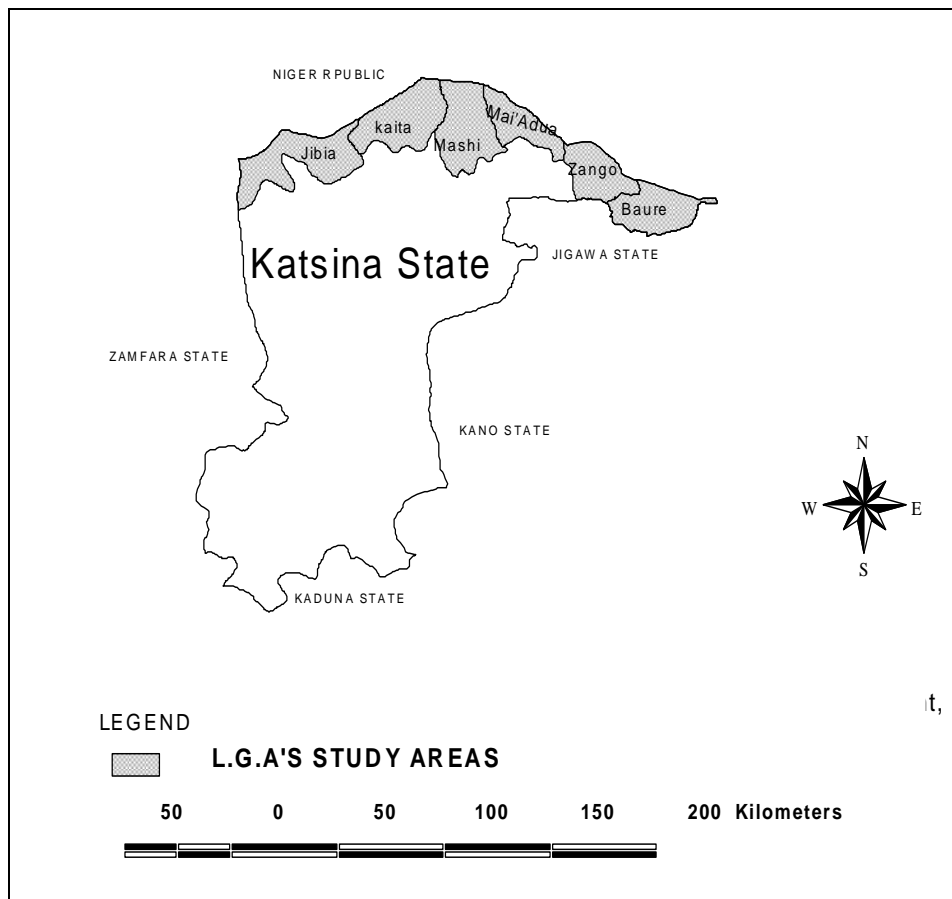


Figure 1: Location of Study sites within Katsina State

common economic activity in the area and fragmented farm land form the dominant feature of the land use pattern. The major crops grown in the area are sorghum, millet, cowpea, pepper and onion. Livestock production is also an important integral part of farming system as both crops grown and the domestic animals are sources of food and income for farmers. The types of livestock kept include goat, sheep, cattle, donkeys and camel and poultry (Lawal, 2012).

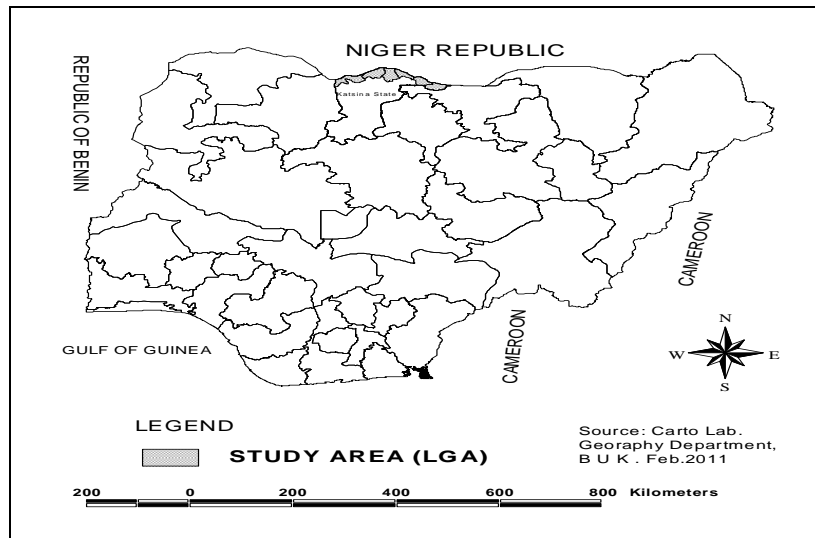


Figure: 2 Location of Study Sites withinnd Nigeria

METHODS

The research was conducted initially in 2010 and new data was added between January – November 2015, in three phases. The first is an exploratory phase of few days was conducted to be reacquainted with the changes in the study area. Prior to formal contact with the local farmers/herders, the study and its purpose were explained to the local traditional rulers with a view of getting maximum cooperation from their people. A total of 12 villages were purposively selected and these villages were located few meters away from Nigeria – Niger republic border. A pilot survey was conducted to test the reliability and viability of the research tools and techniques. All the research assistants that helped in questionnaire administration have tertiary education, and are well acquainted with the terrain of the area and fluent in Hausa, the local language spoken by nearly all the people residing in the study area.

The second phase took place during the cropping season, May – November, 2015 It was planned, to follow farmer's activities during a 6 months period from planting to harvesting. Information was gathered through PRA methods such as participant observation, timeline and local history, transect walk, daily activity profile, seasonal resources calendars, historical resource matrix, key probe, shared presentation and analysis, etc and a series of Focus Group Discussion (FGD) of 8-12 people were held in each village. The FGD is aimed at getting a consensus and on the causes and impact of desertification and how its affect food production in the communities living along Nigeria-Niger republic border. Selections of key informants take into consideration, the age, gender, literacy (western or Arabic/Islamic knowledge) and social status of the participants. As Mogotisi et al., (2011) pointed out that these factors affects variation in knowledge in communities.

The third phase is the use of baseline questionnaire with open-ended and closed-ended questions which allowed for statistical analyses (some of result are not included here) were used to get information on desertification, man-environment relations such as size, land holding, livelihood, farming practices, histories of families, and communities etc. Follow by questions on desertification, its causes and impact in the area. Only the household head were interviewed. It is important to note that the household were stratified into three (small, medium and large scale farmers), the numbers of samples taken from each category of farmers/herders take into consideration their total percentage in each village. Descriptive and inferential statistics were used in the data analysis.

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

Local Govt.	Villages		Location (Coordinates)	Estimated Population	No. of Sample respondents Selected in the village	No. of Sample respondents selected in the Local Govt.	Dominant tribe
Baure	1	Burdudu	12 ⁰ 53'N, 8 ⁰ 43'E	1,350	24	46	Hausa/Fulani
	2	Sawani	12 ⁰ 52'N, 8 ⁰ 49'E	1,300	22		Hausa/Fulani
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
Jibia	1	Magama	13 ⁰ 06'N, 07 ⁰ 16'E	3,600	36	53	Hausa
	2	Faru	13 ⁰ 06'N, 07 ⁰ 11'E	1,760	17		Hausa
Kaita	1	Dankama	13 ⁰ 18'N, 07 ⁰ 47'E	4,500	45	73	Hausa/Fulani
	2	Gishirawa/Matsai	13 ⁰ 10'N, 07 ⁰ 40'E	2,800	28		Hausa
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				28,910	308	308	

Sources: Field Work

RESULT 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. Those who engage both in crop production and livestock rearing, livestock is seen as an inseparable complements to successful farming. An important off-farm activity of the younger men is migration to neighbouring urban centres or to other parts of the country.

Majority of the respondents got their land through inheritance in Zango (70%) and Kaita (71.2%). The pattern of land ownership (largely through inheritance) clearly indicated widespread land fragmentation and the small size of farmlands.

Table: 2 Land Tenure and the Agricultural Production System

	Baure (n=46)		Jibia (n=53)		Kaita (n=73)		Mashi (n=57)		Zango (n=40)		Maiadua (n=39)		Average %
	Fq.	%	Fq.	%	Fq.	%	Fq.	%	Fq.	%	Fq.	%	
Land Tenure													
Owner	12	26	22	42	15	21	14	25	11	27	10	25.6	28
Inherited	25	54.3	25	54.	52	71.2	37	65	28	70	25	64.1	63
Purchased	07	15.2	04	07.	05	6.8	06	10	01	2.5	03	7.7	09
Others	02	4.5	02	04	01	1.5	0.0	0	0	0	01	2.6	02
Average farm size (hectres)	1.5		1.5		1.7		1.7		1.4		1.3		1.5
Adequacy of crops grown for a year consumption													
Adequate	22	48	25	47	35	48	24	42	18	45	16	41	46
Inadequate	24	52	28	53	38	52	33	48	22	55	23	59	54

Source: Field work 2009/2010 and 2015

Drivers of Desertification Identified by Farmers

Deforestation is the conversion of forested areas to meet the energy needs, expand agricultural land and other uses. Evidence of deforestation is visible in all parts of the study area.

Local farmers claimed that loose laws and inadequate personnel to monitor and control forest resource had made it easier for people from Niger Republic to cross the border into Nigeria for fuel wood collection. The farmers and herders living near the border towns maintained that people from Niger republic are responsible for worsening the situation of their areas, and blamed the government for not taking concrete actions to improve the condition of the area.

The most seriously affected areas include forest reserves and rangeland which has been excessively exploited for fuel wood, large scale land clearing for agriculture, and the lopping of trees for livestock feeding in the dry season and the frequent drought in the area. Evidence of deforestation is reflected by the disappearance and decrease of many indigenous trees, shrubs and grass species as reported by the farmers. Example, in most of the villages visited, local farmers mentioned that the doum palm (*hyphaene thebaica*), known locally as ‘Kaba’, used for mat and rope making. The plant is among the dominant vegetation specie in the area, but now is completely extinct in many parts of the study area.

Overgrazing

vergrazing is another important cause of desertification as explained by the local farmers and herders, overgrazing led to removal of the vegetation cover that protects soil from erosion (UNCCD, 2011) or degrades natural vegetation that leads to desertification and decrease in the quality of lands Hence, for various social and economic reasons rooted in their tradition, farmers and pastoralists in the study area would generally like to maximize their herd size, since livestock are considered a sign of wealth, investment, security against crop failure, a source of food, and draught power and a source of manure generation. In all the 12 sampled villages, from 65% to 85% of the household kept livestock for various reasons.

The dry lands of Nigeria is said to support much of the country’s livestock economy, hosting about 90% of the cattle population, about two-thirds of the goats and sheep and almost all donkeys, camels and horses (Olaguju 2015). Between 1950 and 2006, the Nigerian livestock population grew from 6 to 66 million, an eleven fold increase. The forage needs of livestock exceed the carrying capacity of its grasslands (UN, 2007). Chi-square was used to determine whether there is a significant association between the overgrazing and desertification.

Table 3. Pattern of Livestock Ownership

	LOCAL GOVERNMENT AREAS												Average %
	Baure (n=46)		Jibia (n=53)		Kaita (n=73)		Mashi (n=57)		Zango (n=40)		Maiadua (n=39)		
	Freq.	%	Freq.	%	Fre q	%	Fre q	%	Freq	%	Freq	%	
Livestock /Poultry Keeping													
Yes	35	76	29	69	43	72	39	68	31	78	32	83	75
No.	11	24	24	31	30	28	18	32	09	22	07	17	25
Sources of Livestock Fodder													
Natural posture	32	70	26	49	37	51	26	46	25	63	22	56	55
My crop residue	42	91	47	89	62	85	43	75	33	83	33	85	85
Buy fodder	13	28	11	21	23	32	12	21	10	25	11	28	26
Others	05	11	13	25	02	05	03	05	03	08	05	17	11
Reasons for keeping livestock/ poultry													
Means of transport	09	20	08	15	09	12	12	21	07	18	11	28	19
Served as saving	43	93	48	90	46	63	45	79	31	78	28	72	79
Used them as food	23	52	11	21	14	19	14	25	13	33	10	26	29
Source of Income	45	98	49	92	55	75	49	86	33	83	34	87	87
Others	04	09	03	25	20	28	18	32	12	30	09	23	21

Source: Field work 2009/2010 and 2015

The result of Pearson chi-square statistic $p\text{-value}=0.075>0.05$, hence it can be conclude that the reasons for keeping livestock dependent on the LGA's, which implies that the reason why people in Baure LGA keep livestock may not be the same with the reason why people in Jibia LGA keep theirs. This will help in reducing overgrazing because those with reasons such as savings and source of income have higher likelihood to carter need for these animals (i.e they won't allow them to search for food) than those with other reasons. Hence it will reduce overgrazing.

Dependence on fuel wood

The respondents agreed that their socio-economic status necessitate them to felling of trees for fuel wood and the problem will likely to continue if alternative sources of energy were not provided. The respondents unanimously agreed that population growth led to increasing demand for fuel wood hence causes the removal of trees, shrubs, herbaceous plants and grass cover from the fragile land, accelerating the degradation of the soil to desert-like conditions (FAO, 2006). Katsina State has its over 90% energy from fuel wood (Mohammed et al., 2015).

Table : 4 Sources of energy used for cooking

	LOCAL GOVERNMENT AREAS												Average %
	Baure (n=46)		Jibia (n=53)		Kaita (n=73)		Mashi (n=57)		Zango (n=40)		Maiadua (n=39)		
	Freq.	%	Freq.	%	Fre q	%	Frq.	%	Freq.	%	Freq.	%	
Type of Cooking Energy Used													
Firewood	38	83	46	87	61	84	39	68	31	78	27	68	78
Kerosine	04	08	10	19	07	10	03	06	06	14	06	15	12
Animal dung	02	05	03	06	02	03	03	02	03	0	02	04	4
Crop residue	30	65	36	68	63	72	44	78	34	85	32	83	76
Charcoal	01	02	0	0	02	03	1	02	0	0	0	0	01
Others	0	0	0	00	01	02	02	04	05	13	03	12	06

Source: Field work 2009/2010 and 2015

Marginal land cultivation

Farmers also attributed desertification to use of marginal land in crops production and grazing, which are lands areas that are highly susceptible to degradation and could be easily degraded as result of cultivation or grazing (Reed et al.,2013).. Due to population increase and shortage of land, many areas which are degraded and very susceptible to degradation are brought under cultivation particularly during the periods of high rainfall; people tend to extend farming activities into these marginal areas. When these periods of high precipitation is succeeded by abrupt dry periods, the exposed land with very little vegetation cover is prone to wind erosion. Consequently desertification may set in, which could be irreversible except through carefully planned rehabilitation programme. Marginal land cultivation was observed in Kwangwalam, Bumbum, in Maiadua Local Government and Yakubawa in Zango Local Government

Inadequate tree planting

Farmers during the Focus Group Discussion narrated how trees act as a natural windbreak that reduces the mechanical force of strong winds by protecting the crops and when rain falls, the crown of the trees and shrubs breaks the mechanical force of the rain and hit the ground gently. This allows the soil to absorb the rain water and minimize the amount of runoff on the ground, thereby reducing water erosion. Farmers also explained the importance of trees in minimizing the impact of wind erosion, aiding the deposition of blown sediments and protecting the soil from the direct effects of the sun. Majority of the respondents in FGD were not satisfied with the way government handles tree planting. However, they indicated their willingness to participate in tree planting if government could provide the necessary incentives. They opined that an increase in vegetation cover in the area could contribute a lot in the improvement of soil fertility and increase in crop yield. This may be among the reason why many of the sampled farmers linked desertification to inadequate tree planting

Land Fallowing abandonment

Land fallowing is abandoning of land to regain its fertility after years of intensive use (Boserup, 1965). The purpose of land fallowing is to give land a chance to rest, so as to allow the natural process of vegetative decay and organic decomposition to restore the essential nutrients needed by crops. However, it has been found that farmers in the study area knew and appreciated the ecological benefit of land fallowing. But majority of them do not voluntarily practice it because of increasing population and other socio-economic and climatic factors.

In all the villages of the six local governments, 53% of the respondents attributed soil degradation to lack of land fallowing. But despite the acknowledged impact of land fallowing in improving crop yield, only 2% of the farmers had intentionally had their land under fallow. On the other hand 16% have unintentionally fallowed their fields. The reasons given by the farmers who had intentionally have their under fallowed was having more than one farm. But those who fallowed their land unintentionally attributed it to inadequate rainfall and its increasing variability. They claimed that very low rainfall at the beginning of the season discouraged them from planting and subsequent rain came late, making planting risky and waste of resources; hence necessitated them to have their land under fallow.

Inadequate Fertilizer

It is widely believed among the farmers that chemical fertilizer is an important input in the improvement of crop yield. Its proper use can replenish soil nutrients, enhance soil fertility and increase crop yield. However, the use of chemical fertilizer among the farmers of the study area is minimal, majority could not afford it. Government subsidized fertilizer is not adequate; very few people that have connections with the ruling elite have access to it. Some of the respondents (33%) opined that insufficient chemical fertilizer application played a leading role in accelerating soil degradation in the area.

Bush burning

The farmers also recognized the impact of bush burning in accelerating desertification, due to the low relative humidity in the study area coupled with excessive wind during the harmattan period. There is a high incidence of bush fires every dry season which they attributed to bush burning by villagers during land clearing for agricultural purposes; hunters in search of game, set fire unto the vegetation and sometimes cattle herdsman set fire to dry grass to stimulate growth of fresh grasses.

Poverty is perhaps the most important and often neglected cause of desertification. Although, statistical data are hard to come-by, evidence seems to suggest that the vast majority of the inhabitants

of the dry lands of Nigeria live below the poverty level. To a large extent, they depend heavily on the natural resources. Unsustainable practices such as over stocking, over-grazing, cultivation of marginal land are seen as possible responses to a harsh and inhospitable environment and poverty. For any conservation measure to be successful in this environment, it must address the issue of poverty World Resource Institute (WRI, 1988), report linked large populations of impoverished people to environmental degradation. More specifically it stated that:

“Those who are poor and hungry will often destroy their immediate environment in order to survive: They will cut down forest; their livestock will over graze grassland; they will overuse marginal land; and in a growing number they will crowd into congested cities. The cumulative effects of these changes are so far-reaching as to make the poverty self a global scourge” (WRI 1988).

Table 5: Farmers views on the extent of desertification and rating its seriousness overtime.

Local Government	Baure (n=46)		Jibia (n=53)		Kaita (n=73)		Mashi (n=57)		Zango (n=40)		Maiadua (n=39)		Average %
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	
Extent of desertification													
High	29	62	34	64	53	72	29	50	20	50	21	54	59
Moderate	8	18	14	26	12	17	27	47	17	43	16	42	33
Low	9	20	5	10	8	11	01	03	03	07	02	04	10
Severity of desertification Overtime													
Increasing	36	78	38	72	60	82	43	76	32	80	30	78	78
Same	06	12	11	20	12	16	12	21	07	17	09	22	18
Decreasing	04	10	04	08	01	02	02	03	02	03	0	0	5

Source: Field work 2009/2010 and 2015

Majority of the respondents (table 5) in Kaita (72%), Jibia (64%), Baure (62%) and Mai’adua (54%) LGs believed that the extent of desertification is very high in their villages, and predicted that the severity of desertification likely to increase overtime.

Impact of desertification on food security

More than 80% of the population in northern Katsina state like in other part of Nigeria are dependent on agriculture for livelihood. Grains such as millet sorghum, cowpea, and groundnut are the dominant crops grown in the area.

The reasons of desertification given by the farmers clearly indicate that they attributed much of the desertification problems to their land management practices. Hence, any recommended soil conservation measure must take into cognizance the local land husbandry and the holistic thinking of the farmers in order to be successful. In order to break the cycle of poverty in the area, incentives need to be provided to encourage farmers to actively get involved in soil conservation measures.

The people in these areas are small scale farmers with an average farm size of 1.5 hectares and large percentage (63%) of the farm were own through inheritance, They use simple farming implements that cannot subdue the threat posed by their environment. On the average, 54% of the population living in the six local governments cannot grow adequate food for a year consumption. The farmers acknowledge that even those who can feed their family from what they produce for a year, some members of the family, particularly the adult must to go for seasonal migration (ci rani) and some of the young ones from five years and above have to be sent to Islamic school (Almajirci) in neighbouring towns. Most of the respondent during the Focus Group Discussion admitted that it is the necessities that compel them to send their children to Islamic school for Almajirci because even if they allow them to stay at home, there are no means of sustaining them. The farm land in some areas has been taken away by sand dunes while in other locations the fertile soil has been blown away by excessive wind. Hence what was produced on the farm is insufficient to meet the families need.

CONCLUSION AND RECOMMENDATION

The adaptive way in which the local farmers manage their environment, collect and store information in their memory is a good starting point for the western scientists to appreciate and collaborate with the local people in devising ways for improving the existing methods used in fighting environmental challenges facing the rural communities. Hence, less emphasis should be on the introduction of modern techniques to farmers, but more emphasis on how to foster and support local adaptation and inventiveness. In other words, there is the need to start with what already exists (Ajibade, 2008). Hence, in any effort toward human development, it is pertinent to get the views of the targeted population. They are more likely to accept what they have had hand in devising. Any effort toward improving the quality of life of any community, it is important to understand how that community adapts to the prevailing challenges, then builds and improved on the established system, rather than introducing new and complex techniques and technology which majority of the target population cannot manage, afford and sustain

The farmers have also demonstrated their own understanding of the desertification and their role in the processes as the land users. Most of the reasons and indicators of land degradation highlighted by them in the study area, largely conform with the scientific account of these processes

The local farmers are knowledgeable about desertification in the study area. They were able to identify the reasons and indicators of land degradation. Hence, any programme, designed to address desertification in the area should take cognizance of the farmers' knowledge and their holistic thinking of the problem. Because "it is not exclusive knowledge held by scientists that hold the key to understanding and solving environmental problems but the mutual inter dependence of both "expert" and indigenous knowledge" (Mahiri, 1998).

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