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Research article

LAND DEGRADATION AND SOCIO- ECONOMIC DEVELOPMENT IN THE BOLGATANGA MUNICIPALITY: THE GENDER PERSPECTIVES

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ABSTRACT: The research was conducted in the Bolgatanga Municipality. Nyariga and Zaare Amoabiisi communities were purposively sampled for the study. In all, thirty-three (33) questionnaires were administered to thirty-three households within the two communities in the Municipality. The study sought to find out the causes of land degradation and the socio-economic development of the people in the study area. The data analyzed was based on age grouping, sex composition of the respondents, household size, crops planted, type of animals reared, methods of land preparation, fertilizer application, among others. At the end of the study, it was found out that, 83% of the respondents agreed that over-cultivation of land accounted for land degradation in the communities, whiles 79% indicated that, settlement expansion is also responsible for the problem. Eighty percent (80%) of the respondents agreed that, over-grazing of their livestock in the area had seriously affected the quality of the soil thereby causing rapid land degradation. However, 1% to 2% of the respondents disagreed. It is therefore, recommended that, farmers should incorporate legumes, which have the ability to fix atmospheric nitrogen, into the soil and also improve the soil structure, hence, the preservation of the soil fertility.

Key Words: Degradation, Sustainable, Grazing, Community, Manure

INTRODUCTION

Land degradation is a concept in which the value of the biophysical environment is affected by one or more combinations of human-induced processes acting upon the land. It is viewed as any change or disturbance to the land perceived to be deleterious or undesirable. Human activities directly or indirectly affect land degradation [11]. Land degradation is increasing in severity and extent with more than 20 percent of all cultivated areas, 30 percent of forest and 10 percent of grassland all undergoing degradation [4]. The consequences of land degradation include reduced productivity, migration, food insecurity, damage to basic resource and ecosystems, and loss of bio-diversity through changes to habitats at both species and genetic levels [6, 7] noted that land degradation has implications for climate change mitigation and adaption, as the loss of biomass and soil organic matter releases carbon into the atmosphere and affects the quality of soil and its ability to hold water and nutrients. It is believed that degradation is being driven mainly by poor land management [14]. Land degradation is also the cause of environmental degradation as a result of erosion [8]. About 65 percent of Africa's population is affected by land degradation, and the loss in gross annual income is estimated at nine billion United States dollars [12]. The Bolgatanga Municipality in the Upper-East Region, like most Districts in the Northern part of Ghana, is bedeviled with issues of land degradation [9]. Soil loss causes a slowing of poverty reduction over time in the three northern regions of Ghana which currently has the highest poverty rates in the country, [1]. To sustain crops and animals production increases and to ensure food security, soil nutrients and water resources need to be properly managed and conserved [2]. Many factors including population pressure, increase urbanization, and climatic changes have led to land degradation, soil nutrient depletion, over-grazing, pollution, rivers and ground water depletion and desertification [13]. The focus of the current study is to find out whether the high incidence of poverty in the area is as a result of land degradation. The study also seeks to find out who are the most affected by land degradation.

DESCRIPTION OF THE STUDY AREA

The study was conducted in Bolgatanga, the Upper East regional capital of Ghana. It is bounded in the north by Kassena Nankana Municipality, on the west by Sisala District and on the South by West Mamprusi district. The Bolga municipality covers an average land mass of 4.220 km^2 and constitutes 35.1% of total land area of the Upper East region. The climate of the Upper East region is classified as Sudanese characterized by pronounced wet and dry seasons. The district has mean temperature ranging between 21.9^{0}Cand 34.1 ^{0}C, the highest temperature are recorded in March and this can rise to 45 ^{0}Cwhereas the lowest temperature of about 10 ^{o}C, normally recorded in January could be obtained. The dry season is characterized by dry North-Easterly winds and diurnal temperature ranges [3]. The municipality experiences one rainy season starting from April to September and then declines sharply coming to a complete half in mid-October; when dry season sets in; it experiences a mean annual rainfall of 84mm and 1150mm with irregular dry spells occurring in June or July (Bolga Agric Meteorological Report).The the vegetation of the Bolga Municipal is characterized by savannah woodland and consists of deciduous widely fire and drought resistant trees of varying density with dispensed cover of perennial grasses and associated herbs. Through the activities of man the woodland savannah has been reduced to an open pack land where only threes of economic values, like the baobab, acacia, shear nut and dawadawa have been retained to an open pack land where only threes of economic values, like the baobab, acacia, shear nut and dawadawa have been retained with time. These trees satisfy domestic requirements such as fuel wood, timber for local housing and cattle kraal construction. Other requirements are vegetable garden fence and material for handcart. However, in the dry season, annual bushfire decimate the grasses and shrubs and as a result pasture for the livestock is largely destroyed. These bushfires also ravage the forest reserve in the district and render them distinguishable from the surrounding vegetation (Department of Agro forestry, Bolgatanga, 2001). However, the soils of the municipality are developed from five different geological formations namely granite, Birimian rock and voltaic shales. Recent and old alluvium of mixed origin and very old river terraces, out of these dominant soil groups in the district are of granite origin and the over 70% (Approximately 153.300ha) of the district.

RESEARCH METHODOLOGY

The research was a descriptive study involving both qualitative and quantitative methods of data collection. Primary source of data involving questionnaire and focal group discussions, and secondary source involving books, print and electronic media, journals and periodical reports were used to gather relevant information. Multi-stage sampling including purposive sampling; cluster sampling, simple random sampling as well as snow balling sampling methods were used. In each village10 percent of households were drawn randomly from its total population after developing the sampling frame. Thus, a total of thirty-three (33) households were selected for the survey.

RESULTS AND DISCUSSION

Age Range of Respondents

In the conduct of the research, a total of 57.6 % males' and 42.4 % females were selected. A greater percentage of the questionnaires were administered to the males because they formed the majority of those who farm in Nyariga and Zaare Amoabisi communities in the Bolgatanga municipality. The age groups of the respondents ranged between 18 years to more than 60 years (Fig1). The majority of the respondents were people in the active working class as indicated below.

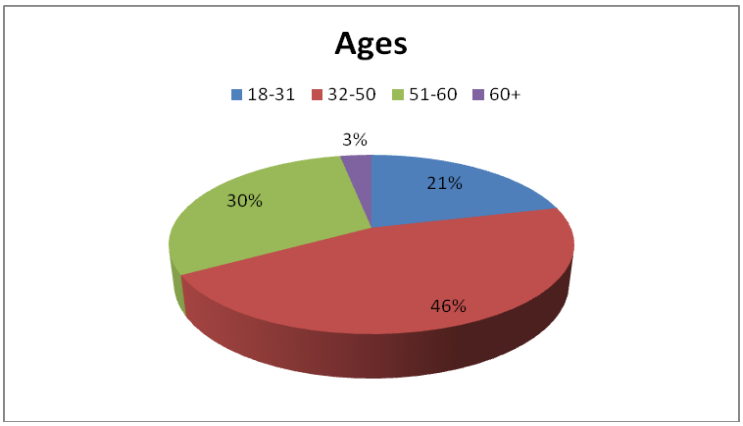


Fig. 1: Age Range of Respondents

Source: field survey (2013)

The research was conducted in a number of households with different sizes and the bar graph below indicates the size ranges of the various households within which the research was conducted. Majority of the households contained 11- 20 members (Fig. 2).

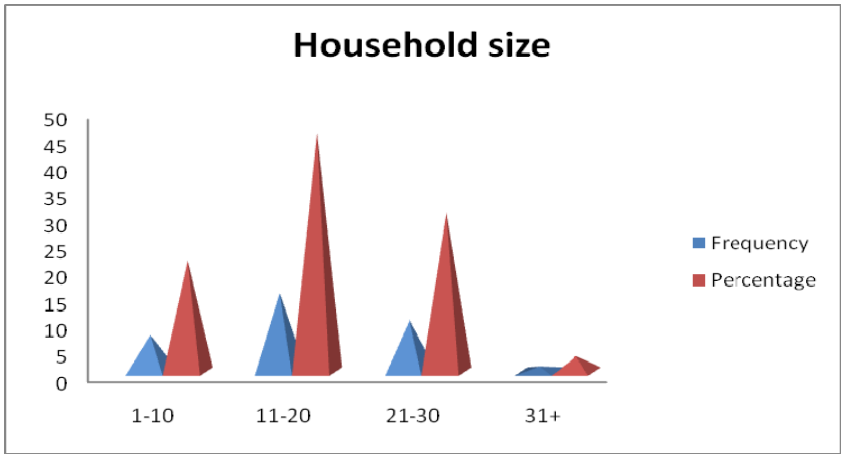


Fig. 2: Household size
Source: field survey (2013)

Evidence of land degradation

One of the major objectives of this work was to first of all ascertain the existence of land degradation in Nyariga and Zaare farming communities of the Bolgatanga municipality. Questions were therefore asked pertaining to the climatic conditions in the area, the nature of the soil and the status of the soil over the past ten to twenty years, and the following results were obtained; Out of the sample size of 33 respondents, majority (97%) agreed that the climate was becoming drier every year and 3 percent agreed that it was wetter every year. Upon interviewing respondents on the state of biodiversity, eighteen percent (18%) of them agreed that the biodiversity is stable while majority sixty-four percent (64%) disagreed. The remaining eighteen percent (18%) were not sure. In the case of decreasing biodiversity, More than two-thirds (88%) of the respondents agreed and 12% strongly agreed that the biodiversity of their localities is actually declining. For increasing biodiversity,67% of the respondents disagreed whereas 3%strongly disagree that there is increasing biodiversity. Twenty-four (24%) and 6% of the respondents respectively, represent those who were not sure and those who agreed that there has been increasing biodiversity. Based on the responses, the status of vegetation and wildlife cover over the past 10-20years has recorded a drastic decrease. From the study, 94% of the respondents agreed on decreased vegetation and wildlife cover and only 6% agreed on stable vegetation and wildlife cover. This clearly depicts that, there is a massive destruction of vegetation and wildlife cover in Nyariga and Zaare Amoabiisi over time.

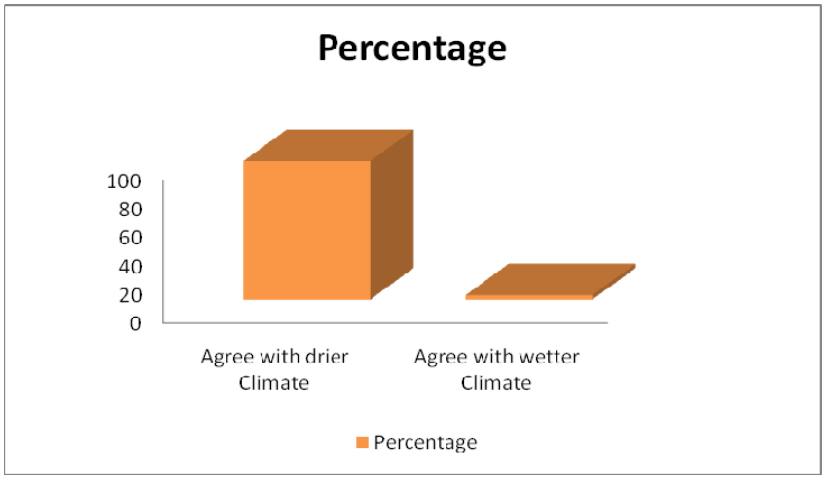


Fig 3: Views of Respondents on Climate
Source: field survey (2012)

Table 1a: Views of Respondent on Stable Biodiversity

Views on stable biodiversity	Frequency of respondents	Percentage (%)
Strongly agree	5	15
Disagree	21	64
Not sure	6	18
Agree	1	3
Total	33	100

Source: field survey, (2012).

Table 1b: Respondents Views on Decreasing Biodiversity

Views on decreasing biodiversity	**Frequency of respondents**	**Percentage**
Agree	29	88
Strongly agree	4	12
Disagree	0	0
Strongly disagree	0	0
Not sure	0	0
Total	33	100

Source: field data (2012)

Table1c: Increasing Biodiversity

Views on increasing biodiversity	**Frequency of respondents**	**Percentage**
Strongly disagree	2	6
Disagree	20	61
Not sure	8	24
Agree	2	6
Strongly agree	1	3
Total	33	100

Source: field data (2012)

Causes of land degradation

After identifying that land degradation was on the increase in these communities, it was imperative to find out the causes of this alarming decrease in the vegetation and wildlife cover on yearly basis. These causes include bush fire, extensive cropping, over grazing, settlement expansion and over cultivation. Bushfire is one of the activities that facilitate land degradation on farms; it reduces soil moisture content and also kills soil microorganisms present in the soil. Bushfire predisposes the top soil for erosion to easily occur. Almost all the respondents agreed that bushfire was a serious threat on land degradation, as revealed by studies carried out in these two selected communities. Seventy six percent (76%) also agreed on cropping extension while 24% strongly agreed. This calls for a serious land management efforts in the two communities. Eighty percent (80%) of the respondents agreed on grazing extension while 19% strongly agreed. This truly shows that, there is a serious grazing extension in both Nyariga and Zaare Amoabiisi communities. Settlement expansion is an increase in population and physical infrastructure. When this occurs agricultural lands are reduced. Based on the randomly selected 33 household of the two communities, 79% agreed to settlement expansion whereas 21% strongly agreed. This actually elaborates that, there is a serious settlement expansion in the two communities which is as a result of limiting and devastating agricultural lands. Through the interviews and questionnaire administered to the two communities of Nyariga and Zaare Amoabiisi, an underground research was conducted concerning harvesting (of trees) in the two communities. It was revealed that, 100% harvesting and cutting down of mother plants on farms is almost a method used by individuals or farmers in these two communities. Based on the interview, more than two-thirds majority (83%) agreed to over harvesting and 17% strongly agreed to it. It was also an objective to find out whether some or all members are more or equally affected negatively by the deplorable state of vegetation and wildlife cover in these farming communities. This was to help in making sustainable recommendations that will adequately address the issues of land degradation in these areas. It was thus; found that children, pregnant and nursing mothers as well as women in general are the worst affected, as shown in Table 2.

Table 2: Category of Persons Affected by Land Degradation

	Children		Pregnant women and nursing mothers		Women		Men		All suffer equally	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Strongly agree	1	3.0	4	12.1	3	9.1	3	9.1	14	42.4
Agree	28	84.8	24	72.7	14	42.4	-	-	13	39.4
Disagree	-	-	1	3.0	1	3.0	30	90.9	4	12.1
Strongly disagree	-	-	1	3.0	-	-	-	-	-	-
Not sure	4	12.1	3	9.1	15	45.5			2	6.1
Total	**33**	**100.00**	**33**	**100.0**	**33**	**100.00**	**33**	**100.00**	**33**	**100.0**

Source: field data (2013)

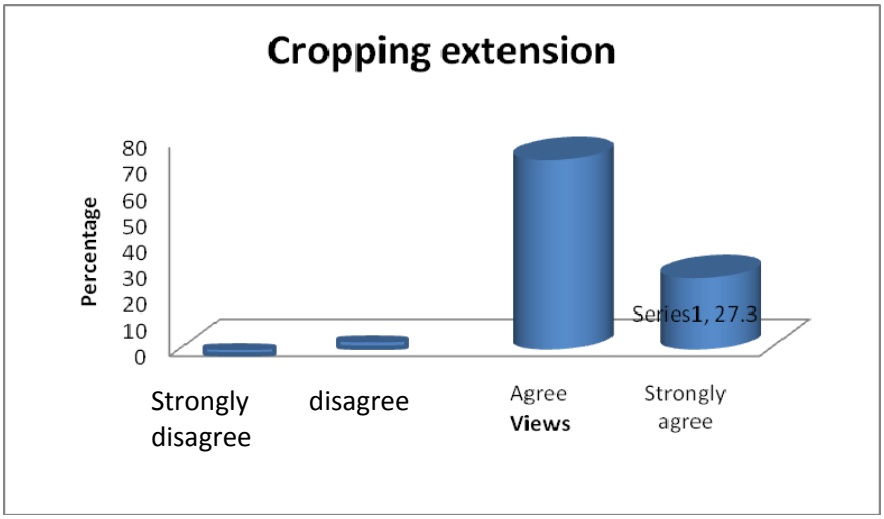
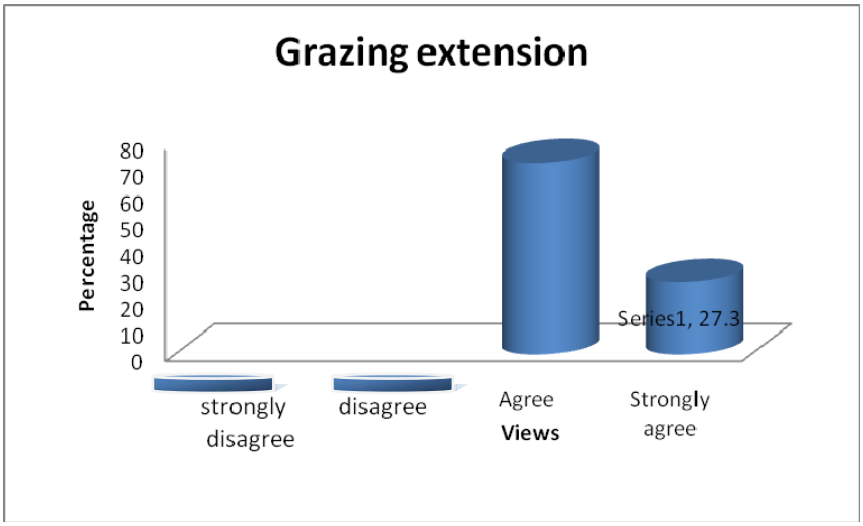


Fig 4: Cropping extension
Source: field data (2012)



Source: field data (2012) Fig 5: Grazing extension

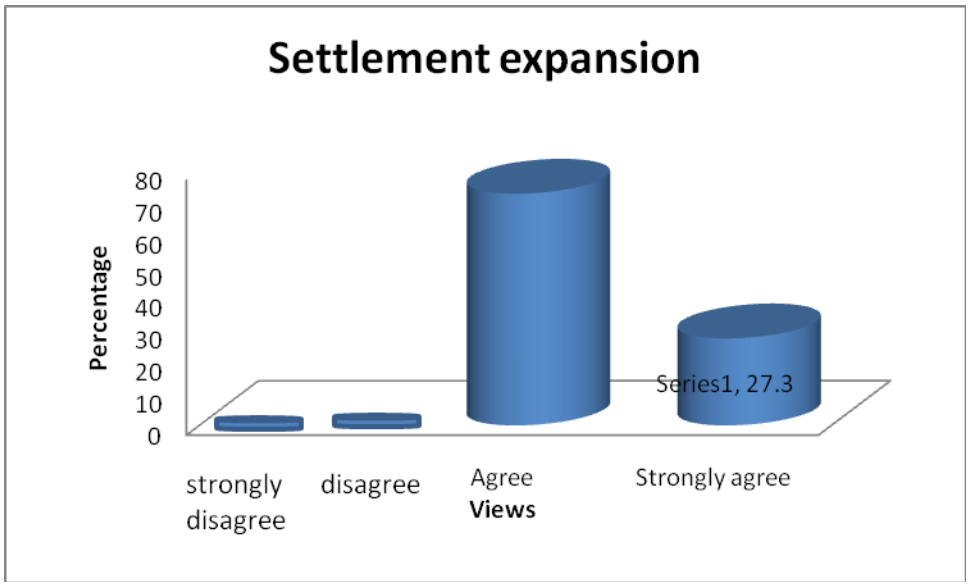


Fig 6: Settlement expansion
Source: field data (2012)

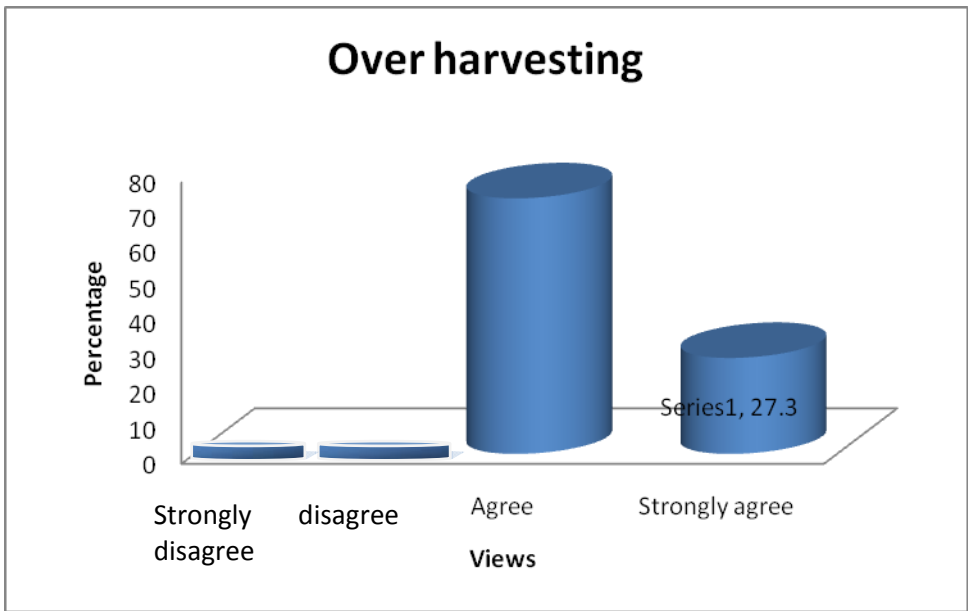


Fig 7: Over harvesting
Source: field data (2012)

CONCLUSION

From the analysis, it is clear that land degradation exists in the area as a result of natural causes such as low rainfall, erosion and wind. The other causes are anthropogenic and include bush fires, cropping extension, over-harvesting of trees, over-grazing and settlement expansion. This implies that farmers themselves are partly to be blamed for the constant land degradation in their communities. It will therefore take only prudent interventions by these farmers themselves and other stakeholders as well as benevolent organizations to salvage the situation in these communities to envisage a change in the rate of degradation in their respective communities. It was also realized that majority of the inhabitants of these communities are usually concentrated in particular areas where they live and farm repeatedly on the same parcel of land while ignoring vast tracts of land in the outskirts of their communities.

This exerts so much pressure on the land rendering it poorer and poorer with each passing year. Farmers should therefore incorporate legumes, which have the ability to fix atmospheric nitrogen into the soil and also improve the soil structure. Mulching and planting of crop trees such as mangoes and cashew to provide shade and to reduce water loss due to transpiration, use of organic fertilizers in place of chemical ones, adoption of irrigation, seasonal rotation of crops every farming season and extension education of farmers on some farming practices are recommended practices that would conserve the land and also maximize productivity.

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