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Assessment of farmers perceptions on land degradation and desertification and its impact on wildlife in Dhera district, Oromia, Ethiopia

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Abstract

There are insufficient information about farmers' perception on land degradation and desertification and its impact on wildlife in Dhera district, Oromia region of Ethiopia. The principal aim of this study was to explore the impacts of desertification and land degradation on wildlife. A seasonal visit was done over a period of a year (September 2018-January 2020). A multi-method approach that is observation, questioners, interview and group discussion was used to collect our data. Data was analyzed using SPSS Software. There is significant difference on socioeconomic data how land degradation and desertification impact wildlife. About 75% of the respondents were aware of causes of land degradation and desertification by indicating population growth, over cultivation, soil erosion, rugged topography, poor farming practices and poverty. Most 65% of the respondents were also aware of consequences of land degradation and desertification. However, few respondents (25%) were not aware of desertification and land degradation impact on wildlife. Most 65% of respondents indicated that land degradation place severe impact on their farm-field. The implications of these trends on the natural resource base include environmental degradation, wildlife decline and food insecurity among the local producers. The study has suggested strengthen soil and water conservation action technology as a potential solution to this continued problem of declining wildlife and rural agricultural production in the area.

Keywords: Desertification, Dhera district, farmers' perception, habitat, land degradation, wildlife

Introduction

Arid and semiarid regions cover more than 40% of Earth's land surface^[8]. The visible sign of this phenomenon is the gradual shift in vegetation from grasses, bushes and occasional tress, to grass and bushes and in the final stages, expansive areas of desert -like sand^[1]. Land degradation in arid and semiarid regions of the globe directly affects about 250 million people in the developing world through the loss of soil nutrients and reduction in the lands productivity, and could potentially affect the 2.5 billion people who live in dry lands worldwide^[10] According to^[5] out of the total land of Africa, 47% is too dry for rain fed agriculture and only 16% of the land has no serious fertility limitation, while the remaining 37% is affected by land degradation. Desertification is a process of severe environmental degradation that occurs when the water balance of nature in an ecosystem is disturbed. This could result in the disappearance or permanent degradation of the vegetation and wildlife^[11]. Disappearing wildlife and plant populations are some of the earliest signs of desertification^[8] Unfortunately, most people do not heed these signs until those farming and ranching land disappear. Because mankind has not yet understood the desertification process and its causes, many tragic mistakes have been made and continue to be made^[6]. No studies have been done in our study area how wildlife are affected and coping the threat of desertification. Information on the perception of farmers on the impact of land degradation and desertification on wildlife was scanty. Generally, the purpose of the study was to investigate farmer's perception on land degradation and desertification and its impact on wildlife of the area.

Materials and Methods

Study area

The study was conducted in a lowland area of Dhera district in the Regional States of Oromia, southeast Ethiopia. It is 125 km away from Addis Ababa and located at 8°16'S longitude and 39°20'E latitude. Five severely affected kebeles were selected to conduct the research. These were Awash-Bishola, Dilfqare, Dire-qiletu, Qoro and Lodsherbi (Figure 1).

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The altitude of the district ranges from 1400-2500m with undulating plains, hills, mountains and degraded land area. It is indicated that the mean annual evapotranspiration in the study area is 1400–1700 mm, which is greater than the mean

annual precipitation 700–1200 mm. This clearly shows that there moisture deficiency in the area. The vegetation of the area was dominated by acacia woodland.

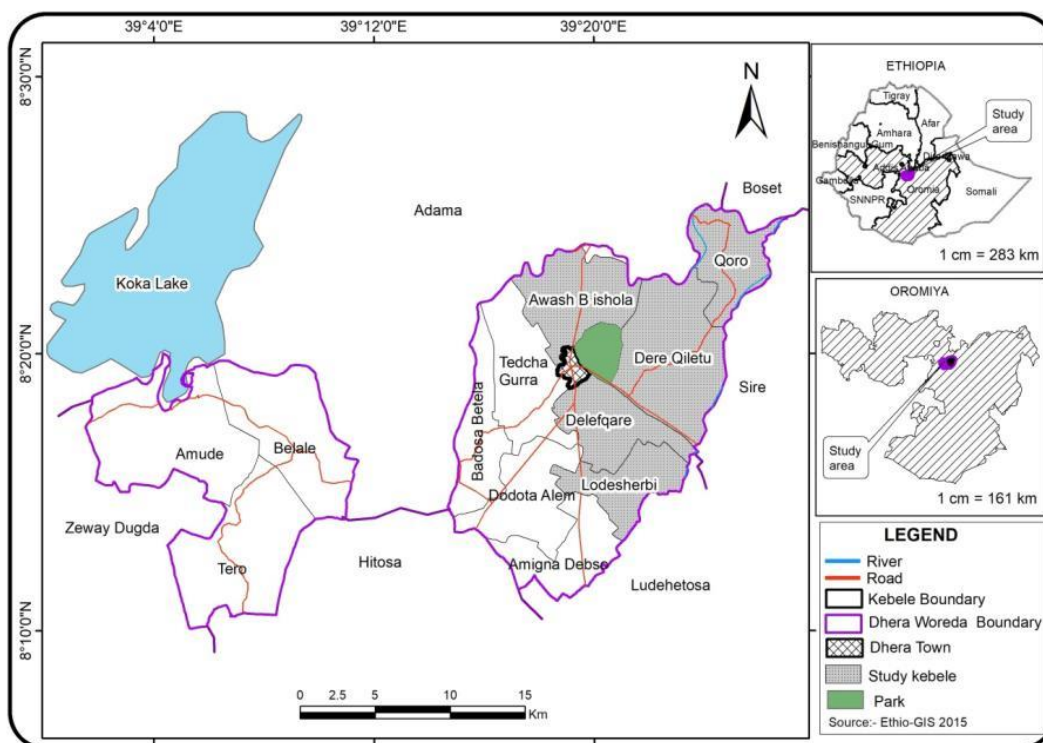


Fig 1: Map of study area

Multi- method approaches were used to collect our data. The study covers both wet and dry seasons. Both Quantitative and qualitative data were collected during both seasons. To know the perception of households concerning land degradation and wildlife status questionnaire survey was carried out. A total of 250 independent households were involved. Questionnaire was delivered for residents who are living near and most affected areas of the districts. The questionnaire measures perception of each household, knowledge, concerns, attitudes and willingness to conserve wildlife, level of awareness and challenges faced in the area. Interviews also conducted with 21 individuals, natural resource conservation officers working at the district. Focused group discussions were held with 25 purposely selected individuals with different backgrounds.

The elderly farmers, village leaders, developmental agents and socially respected farmers who have better knowledge on the present and past environmental, social and economic status of the study areas were involved. The quantitative data were analyzed using SPSS software with subsequent statistical test.

Results

The average age of participated individuals was 31.2, with a minimum age of 16 years and maximum of 61years. Only 6% of the respondents were illiterate. 56.4% have 0.5 hectare and 43.6% have more than one hectare. 52% of them have 0-2 livestock's, 44% of the respondents have 3-5 livestock's and 4% of them have six and above livestock's (Table 1).

Table 1: Socioeconomic data of respondents (N=250)

Attributes of respondents	Categories	Frequency	Percentages
Age	<25 years	39	15.6%
	26-50 years	204	81.6%
	51-75 years	7	2.8%
	≥76 year	-	-
	Total	250	100%
Sex	Male	193	77.2%
	Female	57	22.8%
	Total	250	100%
Marital status	Married	196	78.4%
	Single	51	20.4%
	Divorced	3	1.2%
	Total	250	100%
Educational level	Uneducated	15	6%
	Primary	108	43.2%
	High school	98	39.2%
	Preparatory	20	8%

	Diploma	9	3.6%
	First degree	-	-
	Other	-	-
	Total	250	100%
Farming experience	1-10	155	62%
	11-21	83	33.2%
	22-32	12	4.8%
	Total	250	100%
Land holding size	Less than 0.5 hectare	141	56.4%
	More than 1 total	109	43.6%
		250	100%
Livestock owner ship	0-2	130	52%
	3-5	110	44%
	Above 5	10	4%
	Total	250	100%
Family size	1	50	20%
	2-4	193	77.2%
	5-7	5	2%
	Above 7	2	.8%
	Total	250	100%

There is significant difference between age groups ($\chi^2= 98.1$, $df=3$ $p<0.05$) on the impact of land degradation and desertification on wildlife. There were also significant

differences between educational levels on the impact had on wildlife. The more educated group sense the impact better than the lower grade respondents (Table 2).

Table 2: Socioeconomic data on land degradation and desertification impact on wildlife

Variables	Do you think land degradation and desertification impact on wildlife?				Chi- square	p-value
	Categories	Yes	No	Don't know		
Age	Below 25	13	26	0	98.127	0.010
	26-50	169	42	3		
	51-75	6	1	0		
	Above 75	0	0	0		
	Total	178	69	3		
Sex	Male	141	52	0	6.535	0.038
	female	34	22	1		
	total	175	74	1		
Marital status	Married	147	38	3	21.623	0.000
	Single	29	30	0		
	Divorced	2	1	0		
	Total	178	69	3		
Educational attainment	Uneducated	13	8	0	15.665	0.047
	Primary	74	32	0		
	High school	64	30	0		
	Preparatory	16	3	1		
	Diploma	8	1	0		
	Total	175	74	1		
Family size	1	19	31	0	32.068	0.000
	2-4	150	42	1		
	5-7	4	1	0		
	above total	2	0	0		
	total	175	74	1		
Land holding in hectare	Less 0.5	94	53	0	7.084	0.029
	Above 1	74	26	3		
	Total	168	79	3		
Farming experience in year	1-10	7	20	0	7.420	0.115
	11-21	92	52	1		
	22-32	8	2	0		
	Total	175	74	1		

Most discussants stressed on the desertification in the area is the combination of both natural and human factors, which results in a decline of productivity or the degradation of natural resources, such as the constant destruction and deterioration of the land, which reduces the usefulness of their areas to man as well as wildlife. Once dominant wild mammals in the area were Greater kudu, lesser kudu, Spotted hyena, Warthog, Golden backed jackal, Abyssinian hare, Leopard, Grivet monkey, Anubis baboon and Grey duiker

dwindled year after year as a result of decline of the quality of their habitat.

Most of the respondents (65.2%) know as there is land degradation in their area. And as humans have great contribution for the degradation. 85.6% stated as they dependant on the existing plant for cooking and means of income. They also informed as they tried to overcome land degradation impact with planting different species but lacks follow up (Table 3).

Table 3: Occurrence and measures taken to overcome the impact

Questions	Yes (%)	No (%)	Don't know (%)
Occurrence of land degradation in the area	65.2%	34%	0.8%
Contribution of human for land degradation	71.6%	27.2%	1.2%
Use of plants for firewood	85.6%	10.8%	3.6%
Planting of different plant species	83.2%	14.4%	2.4%
Conserving of the planted seedling	22.8%	72.8%	4.4%
Increase of crops products from year to year	25.2%	54.8%	20%
Appearance of invasive plants	52.4%	33.6%	14%
Action of governmental bodies on conservation activities	32.4%	57.2%	10.4%
Appearance of drought in the area	78%	13.6%	8.4%
Over grazing in the area	68%	16%	15.6%

The dominant man induced causes of land degradation in the area are poor farming practices, population pressure, soil erosion and deforestation. Lack of early awareness about soil erosion and soil fertility decline by farmers is another possible cause of land degradation. One major consequence of land degradation respondents raised was reduction of agricultural crop yield. Although farmers show high level of awareness about land degradation, the causes and its consequences, there is a wide gap by demographic and socio economic factors. Hence, some of the demographic and socio economic factors were taken to further analyses to see whether there is significant association between awareness of farmers with their back ground variables or not.

Discussion

As it has been mentioned by many literatures the land degradation highly affected by a number of demographic and socio economic factors in a certain area. Some of these factors which are considered in this study include age from demographic group, educational status from the social factors, income level and farm land size from the economic aspect were taken and analyzed whether they have significant association with land degradation or not by using different techniques which have been mentioned on the above. The common perception or common logic on the relation between population dynamics and land degradation/desertification is that population pressures lead to the intensification and exacerbation of the problem. Indeed research findings and evidence from several developing countries (Costa Rica, Pakistan and Uganda) support this notion [13]. Nevertheless in many cases land degradation and desertification occur in geographical areas with limited population pressures. Furthermore periods of population decline coincide with the exacerbation of the problem [14]. These observations show that the relation between population dynamics and pressures and desertification is complex and non-linear and that always other contributing factors (socio-economic and natural) must be taken into account [9]. High absolute population numbers in an area or population increase does not necessarily lead to land degradation and desertification. What is more important is the combination of the sensitivity and fragility of land, of the rate of population increase and of other crucial contributing factors and driving forces such as land use and settlements patterns, social and economic conditions and cultivation practices etc. [12]. Thus there seems to be no simple and clear causal connection between population growth and pressure and desertification or a stable and static "carrying capacity" of land beyond of which the problem starts to worsen. Deforestation and forest cutting to satisfy the growing household arable and pasture land demand along with the growing fuel wood needs were acknowledged by a good proportion of the respondents as the causes of soil

erosion in the study place. It is also found that the amount of daily fuel wood demand for household use and the number of people involved in fire wood collection is high and growing temporally. Farmers' decisions to conserve natural resources generally and land (soil) and water particularly are largely determined by their knowledge of the problems and perceived benefits of conservation [2]. The responses, commitment and responsibilities required for the success of formulation of appropriate resource management policies depend on perception of the problem by small holder farmer [3]. Thus land degradation due to erosion and conservation cannot be understood without studying how people use the land and the reasoning that guides their decision about land use [7]. Many native wildlife on the area declining in number and kind due to deforestation, desertification and the conversion of land from its natural state to a agricultural land which place the largest impact of on native wildlife. All animal species require certain habitat features to survive. Deforestation typically eliminates or significantly changes many important habitat features found in a natural area, thus reducing or eliminating the habitat value of that area. For example, a diverse wildlife population depends upon the natural diversity of native plants of areas. Deforestation in the area changes the vegetative community and making it more difficult for many native species to survive.

Conclusion

Majority of farmer in the study area have an awareness regarding the cause and consequence degradation of lands and desertification in order to minimize it they afforest their environments but due to lack of electrical energy most of the farmers use those forests for fire wood and economical income, even if the farmers and the people around there have the habit of planting different seedling during the summer seasons both the farmers and the governmental bodies lack preserving it and most of the seedlings are destroyed due to farmers cattle's and camels which come from other area. The causes for land degradation and desertification are rapid population growth, shortage of land, soil erosion, poor farming practices, and over cultivation. The awareness of the farmers regarding land degradation and desertification is highly influenced by their age, sex, educational back ground, family size. Land degradation and desertification in the area is the combination of both natural and human factors, which results in a decline of productivity or the degradation of natural resources, such as the constant destruction and deterioration of the land, which reduces the usefulness of these areas to wildlife and man. The wildlife that is the integral part of biodiversity can't be saved until we tackle and solve the issues behind their extinction

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