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Deforestation: Causes, Factors Affecting Deforestation and Preventative Strategies in Pastoralist Dry Land Area: The Case of Borena Pastoralist, Southern Ethiopia

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Abstract

Deforestation is the conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development. Deforestation is the removal of the existing natural vegetation cover; Deforestation reduces the supply of forest products and leads to siltation, flooding and soil degradation. Deforestation reduces the supply of forest products and leads to siltation, flooding and soil degradation. Deforestation reduces the supply of forest products and leads to siltation, flooding and soil degradation. Deforestation is defined as the conversion process of forested land to non-forested land. Therefore, the objective of this research paper was to assess Deforestation: Causes, Effects and preventative strategies in borana pastoralist area and specific objects to identify causes of deforestation, effect of deforestation and preventative strategies. This study was under take in pastoral districts of borana zone, more focus on Guchi, Gomole, and Elwaye districts of the Borana zone of Oromia Regional State. The data collection methods was conducted in this research include in-depth interview, observations, focus group discussions (FGD). While selecting participants for key informant interview and FGD, snow ball sampling was used. The data gathered from different sources Primary and secondary sources was conducted to carry out this research. Results Deforestation is defined as the removal of the stand where land is changed in to a non-forest land-use, conclude that Fast deteriorating health of physical environment due to unorganized and indiscriminate use of natural resources has given rise to problems which make environmental management necessary and recommendations Promote tree planting (afforestation, reforestation, and agroforestry) with emphasis on multipurpose and highly adaptable tree and shrub species (primarily indigenous species).

Key words: Deforestation; causes; Forests.

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1. Introduction

Deforestation is the conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development [55] Deforestation is primarily a concern for the developing countries of the tropics [46] as it is shrinking areas of the tropical forests [13] FAO considers a plantation of trees established primarily for timber production to be forest and therefore does not classify natural forest conversion to plantation as deforestation (but still records it as a loss of natural forests). However, FAO does not consider tree plantations that provide non-timber products to be forest although they do classify rubber plantations as forest. Forest degradation occurs when the ecosystem functions of the forest are degraded but where the area remains forested rather cleared [7] A forest can be defined as a land with canopy cover more than 10%, straddling an area greater than 0.5 hac, including the trees with height larger than 5m [3] Forests provides carbon storage and other benefits while delivering a lot of environmental and social benefits, such as timber and biomass resources, clean water, wildlife habitat, and recreation [43].Forests cover was just 4 billion hac (30% of land) in 2005, 36% of which are classified as primary forests. About two third of known land-based species are in forests but now these are going to extinction. Approximately 8000 tree species which make 9% of the total number of tree species are under threat of extinction [41]. Deforestation is the removal of the existing natural vegetation cover; especially where the native cover is largely forest [43] Deforestation is the clearing away of forests by a process in which an area depleted its existing natural forest vegetation and resources [1]. The conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development is called deforestation [24].High rate of deforestation is one of the major problems in Pakistan. According to different studies and surveys it is stated that forests are spread over less than 4.6 M hack of total area. These forests undergo rapid degradation especially in the mountain area and the deforestation rate is nearly 1.5% which is very high alarming and threat to ecosystem (Ali and his colleagues 2006). FAO and UNEP as quoted by [40] defined deforestation as the removal or damage of vegetation in the forest to the extent that it no more supports its natural flora and fauna. In other words, deforestation is the transformation of forest land to non-forest land. Forest land that includes lands under agro-forestry and shifting cultivation is not surely closed-canopy primary forests. [12]indicates that forests and the benefits they provide in the form of wood, food, income and watershed protection against land degradation have an important and critical role to play in enabling people to secure a stable adequate food supply. Deforestation reduces the supply of forest products and leads to siltation, flooding and soil degradation.

. Consumption of wood for fuel occurs not only in rural areas, but also in urban areas. Area attributed to deforestation stands at 150, 000 to 200,000 hectares per year, (FAO as quoted by WB as quoted by [38, 14]. Deforestation is defined as the conversion process of forested land to non-forested land [16, 20, 40] The most common causes of deforestation include resource privatization, fiscal incentives for land conversion, tenure policies, urbanization, resettlement development, and in tropical areas, the demand for agricultural land is the main driver[2,4,12,17,26,34,48,52]. According to the [32] recent evidence shows that in areas with a high rate of deforestation, commercial farmers are the main agents of deforestation [2, 42, 44, 50, 51]. Previous studies from many countries show how improved productivity and policy interventions concerning land rights security have positive impacts on food security and deterring deforestation [6, 21, 26, 29, 33, 53, 54].Moreover deforestation can lead to increase in the albedo of the land surface and hence affects the radiation budget of the

region [25,49,36,]. Deforestation also disrupts the global water cycle [23].With removal of part of the forest, the area cannot hold as much water creating a drier climate. The biodiversity loss and associated large changes in forest cover could trigger abrupt, irreversible and harmful changes. These include regional climate change including feedback effects that could theoretically shift rainforests to savannas and the emergence of new pathogens as the growing trade in bush meat increases contact between humans and animals [9]. Significant work is underway on tools for use in monitoring developing country adherence to their agreed REDDS targets [27]. The provision of protected areas is fundamental in any attempt to conserve biodiversity [46, 47]. Therefore, the objective of this research paper was to assess Deforestation: Causes, Effects and preventative strategies in borana pastoralist area and specific objects to identify causes of deforestation, effect of deforestation and preventative strategies.

2. Materials and Methods

Description of study area: This study was under take in pastoral districts of borana zone, more focus on Guchi, Gomole, and Elwaye districts of the Borana zone of Oromia Regional State. The Borana Rangeland is found in Oromia National Regional State, southern Ethiopia, lying between 3036‟ 600 38‟ N and 36043‟- 410 40‟ E geographical grids in the Southern part of the Regional State of Oromia, it has a spatial area of 69,373.3 km2 (about 7.6-12.3% and 19.5% of the total land area of Ethiopia and Oromia, respectively, Borana zone is one of the zones of Oromia Regional State, located at about 570 kilo meters south of Finfine on the way to Kenya. According to Borana Zone Report, Monitoring and Evaluation Office [18]. Borana zone covers total land area of 63,939 km square with the total population of 1,626,930 (male 821,733 and female 805,197). Pastoralist in zone had total 2,238,304 cattle, 1,348,336 sheep, 2,195,665 goats and 343,188 camels [19]. The Borana rangeland is principally characterized by arid and semi-arid climatic conditions except some pocket areas with relatively humid climatic condition. According to the (1999) joint report of Oromia Agricultural Bureau and GTZ, the mean annual temperature varies from 18-25 degree Celsius with slight seasonal variation depending on the location of different meteorological stations. According to the 1999 report of Oromia Agricultural Bureau, for instance, the Borana rangeland receives the total annual rainfall of 440- 1100mm. Watson stated that Borana rangeland receives the total annual rainfall ranging from 400-700mm [57]. Borana rangeland receives bimodal rainfall distribution. That is *ganna* (the “main” rainy season from March to May) and *hagaya* (small rainy season from September to November) are the two important rainy seasons. More than half of the rainfall in Borana rangeland is received in *ganna*. In terms of vegetation cover and patterns of distribution, the majority of Borana land is covered by savanna vegetation with short and scattered thorny bush. According to [35], Borana range lands constitute deciduous woodland vegetation such as genera Combretum and Terminalia, whereas, the bush lands and thickets, which cover major parts of Borana, land, are dominated by acacia and commiphora species. Animal husbandry is the commonly practiced old age economic system as ecological settings of Borana rangeland is more suitable for animal rearing than for crop cultivation [11]

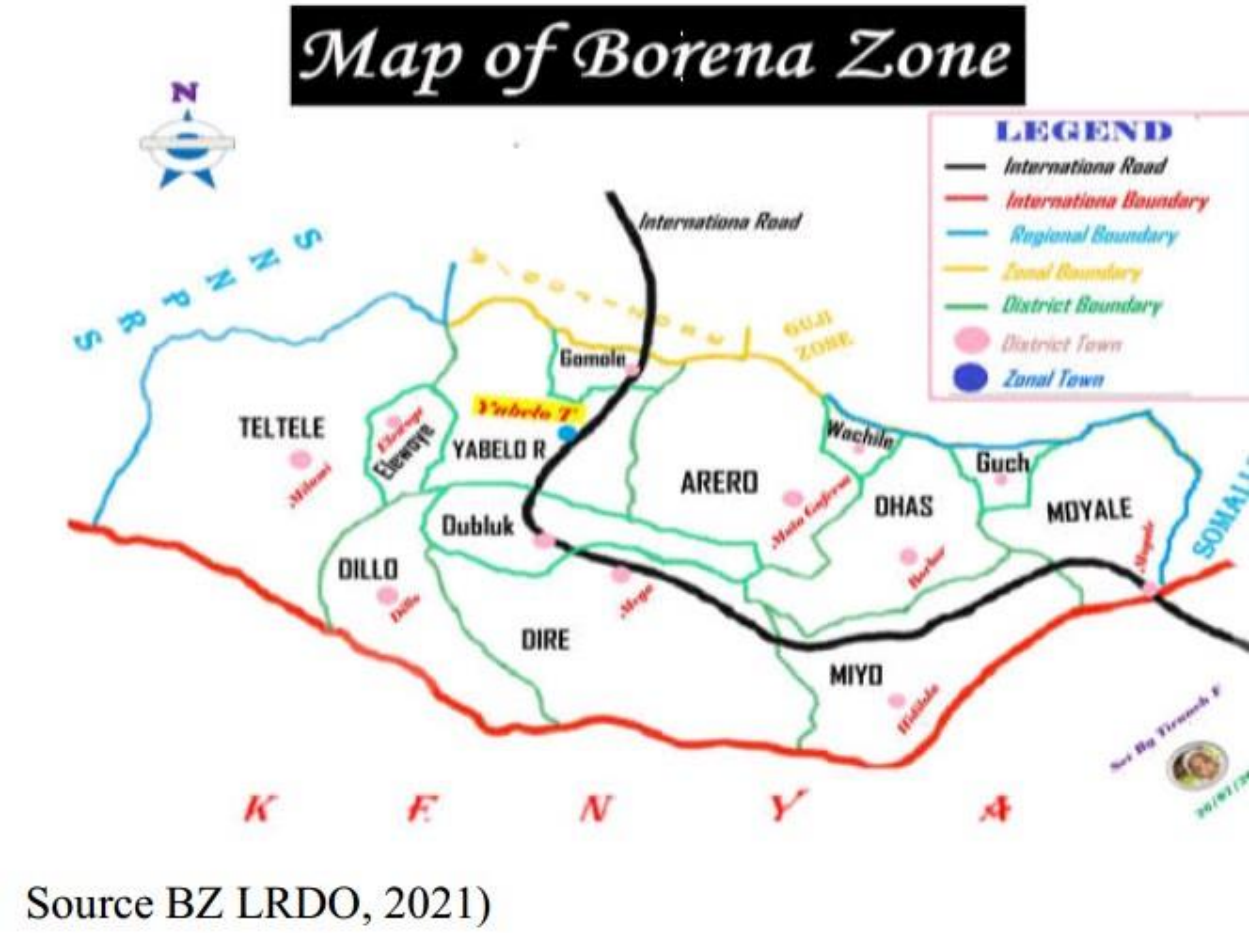

Figure 5

2.1. Methods of Data Collection

The data collection methods was conducted in this research include in-depth interview, observations, focus group discussions (FGD). This research was conducted in Guchi, waccile and Elwaye districts of the Borana zone of Oromia Regional State. From those woreda three woreda purposely selected by, availability of rangeland and transportation service from each woreda. While selecting participants for key informant interview and FGD, snow ball sampling was used. Snowball is a sampling technique used to identify cases of interests reported by people who know other people involved in analogous cases and have insights into the IEK of the Borana pastoralists [15].

In-depth Interview: was carried out with key informants. In-depth interview, an open ended, discovery oriented and unstructured interview which is conducted to understand person's insight, feeling, thought and opinion about the topic of interest. It assists to elicit the individual perception about Borana traditional range resources management, and manage forest resources system. In depth interview was conducted with ten individuals per each kebele. Those who will participate in the in-depth interview will be community elders, youth and women resident of Kebele. Personal Observation: is another method of data gathering tool that used in this research. During the data collection period, the researcher was made observations at different sites and practices of natural

resources management. Direct personal observations, for instance, were made to various grazing sites, utilization and management system. Focus Group Discussions (FGD): **Focus Group Discussions (FGD)**: has been employed in data gathering process during the time of data collection. Participants were divided into three groups and discussions will be conducted. Each of the groups consists of ten individuals from each selected woredas. Totally, thirty individuals will be participated on FGD. In groups' Abba dheeda, influential traditional leaders and councilor (hayyuu) must be participated in FGD session. In groups' Abba dheeda, influential traditional leaders and councilor (hayyuu) and forest committee must be participated in FGD. According to Mishra [45] the optimum size for FGD should be six to eight participants per session. For this study, sample size for FGD was conditioned by two factors: the group must be small enough for everyone to participate and more manageable in contrast to larger group usually harder for moderator to control.

2.1.4. Data Analysis

The data gathered from different sources Primary and secondary sources was conducted to carry out this research. The primary data used in this research was obtained during field work by employing various methods described in the subsequent section. Following the completion of data collection, the results of the analysis were interpreted and discussed by using qualitative approach. The method of analysis used under this study was a qualitative approach of thematic analysis. Thematic analysis is a method used for "identifying, analyzing, and reporting themes within the data" [22]

2.3. Results and Discussion

Deforestation

Divulge that the affair of the deforestation increasing in frequencies and widely spreading in Borana pastoralist land, especially Guchi, Gomole, and Elwaye districts of the Borana zone of Oromia Regional State. Coincide, in the last three years of Gada Guyo Boru 1985-1993 two widely spreading severe deforestation biff the Borena community. Deforestation is one of the serious problems in borana pastoral areas especially in the study area, as observed during the site assessment and observation, Pastoralist within the study area has to move long distances to lash down the first available tree to obtain wood for fuel and construction, for illegal marketing, charcoal especially in Elwaye and Gomole woreda. Moyale woreda pastoralist land more the respondent replied that the forest of the area is cleaned for fair wood, for agricultural purpose, for income and for construction of house. According table: 1 some respondent said during years of Gada Boru Madha 1993-2001, Boru Madha 1993-2001, and Liban Jaldesa 2001-2009 deforestation is increase in borana pastoral area. Generally, the increased severity of deforestation is the uttermost venturesome issue that the respondent emphasizes about deforestation. This was because the embarrassment of concerted invoke exhilarative as result may impair the sustainability of their livelihood coeval.

Table 1: Expansion of Deforestation Concerning Borana Pastoralists GADA Timeline

Gada Period	Year	Frequency	Areas coverage
Boru Madha 1993-2001	1989-93	3	Widespread
Boru Madha 1993-2001	1995-2000	3	Widespread
LibanJaldesa2001-2009	2005-08	3	Widespread
Guyo Goba 2009-2017	2009- 2017	2	Widespread
Kura Jarso 2018-Present	2018	1	Widespread

Source: Survey Result, august, 2021

2.3.1.1. Causes of Deforestation

The below table: 2. Show that the major causes of deforestation specifically in the study area. According to local community, the major causes of deforestation in the study area are agricultural expansions, urbanization, and fuel wood energy consumptions and others. As most respondents said that, 32% of the Major causes of deforestation are agricultural expansion; the remaining was for fuel wood collection 25%, urbanization 20%, and 24% other services. Borana pastoralist area land cover is changed, grass land convert into agriculture, forest land convert into agricultural land, Shifting agriculture also called slash and burn agriculture is the clearing of forested land for raising or growing the crops until the soil is exhausted of nutrients and/or the site is overtaken by weeds and then moving on to clear more forest. The current land use systems in Borana rangeland rapidly changing from pasture to cropland particularly Gomole and Elwaye are leading, therefore crop cultivation competing the land with livestock, now pastureland became evaded then feed shortage occurs during dry season. According to the response of many of the respondents, forest resources were being declined over time. It was indicated that the main causes of forest resource degradation in the study area were farmland expansion in forest area, illegal timber trading and wood fuel production which resulted in decline of forage base, soil fertility and water points decline, loss of indigenous resources, and difficulty for livestock to pass drought year. Furthermore, the forest resources in the study area were devastated in form of charcoal production illegal timber trading to Moyale and timber trading to urban areas and burning of forest land for farm land invasions. According to the respondents of this study and observation by the researcher through transect walk, different types of large trees like *J. procera, O. europea* and also others species were fell down by communities to full fill the above stated factors. Overgrazing is furthermore common in borana pastoralist southern areas of the where rangeland degraded by overgrazing are subject to soil erosion, gully formation, loss top soil, diminished soil fertility, loss palatable grasses, loss of vegetation cover, shortage of water and so on. Stripping trees to provide fodder for grazing animals can also be a problem in some dry areas of the tropics but is probably not a major cause of deforestation. Clear cutting and overgrazing have turned large areas especially in Gomole, and Elwaye into a

desert They are direct and indirect causes of deforestation. The Deforestation is one of the serious problems in borana pastoral areas especially in the study area, causes of deforestation in study area are Cattle Grazing, Agriculture, Poverty, Unemployment, Policies and Management, Expansion of farming land, Forest and other plantations, Overgrazing, Corruption and political cause. Deforestation in borana pastoralist land is resulting due to concerted causes in which the harmonize causes were in population density, commercial usage, migration towards forest areas, fuel wood, charcoal, uncontrollable animal grazing, unemployment, construction of houses, poverty and conversion of forest land to agricultural land.

Table 2

Major Causes	Frequency	Percentage
Agricultural expansion	51	32
Collection wood for fuel	40	25
Urbanization	32	20
Others	39	24

Source: Survey Result, august, 2021

Agricultural Expansion

As most of respondents, said that 32% of the area forest deforestation is caused by agricultural expansion. Agriculture was mentioned as a major key player of livelihood for most rural households in the borana pastoralists' area. Were some of crops important to generate income for local communities and during discussion with selected respondents, the majority of local community in the study area mainly dependent on agriculture and few was agro pastoralist. One of the respondents said that the reason why expansion of agriculture is due to immediate solution rather long term that means, products being obtained from agriculture takes short period of time and also it is possible to generate income in short period of time than forests which takes long period to get its outputs and also it takes long period of time to get income from it.

Fuel Wood Collection

As the respondent, said that 25% of the kebele forest deforestation is caused by fuel wood collection in the study area. According to the respondents, in the study area fuel wood consumption was the common and major household energy source for home based activities, food cooking. Because of the lack of modern electric energy supply, the majority of the households are depends on fuel wood. Coincide to the information obtained from especially Guchi, Gomole, and Elwaye districts of the Borana zone of Oromia Regional State respondents, the price of fuel wood was snap during summer and winter season. The reason why the price of fuel wood varies through season in the study area was because during summer many people from rural area and the town residents collect and bring fuel wood to the town and the demand of fuel wood by the community decrease as it takes long time to dry. During summer, instead of fuel wood some households use for commercial purpose and different home based activities

Figure 1: for fuel wood forest destruction.

Urbanization

As respondent said, that 20% of the kebele forest deforestation is caused by urban developments. According to their conviction, motley constructions took place on the area, which replaced the forest areas for expansions of urban centers. As aftermath, constructions and infrastructures were built. Like expansions of different building of schools, clinic, cultural offices, etc., were some of the infrastructures built on the area to expand urbanization. Through discussion with key-informants, in the study area urbanization was being key artifice consequential purpose for philanthropy of deforestation. So, before urbanization it was better to consider issues related to protection and management of the environment, especially the local people should have access to awareness creation regarding how to conserve forests and other natural resources on sustainable manners and the stakeholders in the study area should participate and working, on the environment in sustainable way.

2.4. Factor Affecting Forest Resources

There are several factors causing deforestation in study area. The respondents indicated that different natural (2%) and anthropogenic (98%) factors were accounting for degradation of forest resource in study area. This two major process of deforestation were responsible for deterioration of forest resources in the study area. Thus, it is clear from this that the existing problem of loss of forest resources is mainly manmade and needs attention from the concerned body to improve its forest resource management. In general, the major factors which affected forest resources in Zambia were shifting agriculture, agricultural intensification, charcoal production, fuel wood collection, logging, settlements, uncontrolled fires, industrialization and urban expansion [56]

2.4.1. Natural Factors Affecting Deforestation

According to respondents the major natural factors accounted for deforestation is reoccurrence of drought (98.5%) and the other factors for the forest resources deforestation in the study area was natural forest fire which accounts for about 1.5% percent. FGD participants especially those elderly ones in the society clan witnessed that, at the Period of Adi Doyo Gada (1899-1906) wildfire raised from Liban province /district caused high deforestation in Yabello forest. Not only this, it caused uncountable destruction in wild animals and human on their life and many of wild animals like elephants, giraffes and antelopes escaped to near Kenya . Similarly, in 1973/74 alone, it is assessed that the Afar missed 25% of livestock resources and over 30% of human population

by drought [39] and in decade, drought paired with the El Nino effect, has again been reduced herd sizes in Afar [58].

2.4.2. Anthropogenic Factors Affecting Deforestation

Several factors related to human activity causes deterioration of forest resources in study area. Respondents indicated that, among the other things poverty (67.8%), demography (increase number of livestock and human population) (27.8%), conflict and poor governance (2.6%), social problem (1.5%) and technology (road, electric power construction) (0.4%) were the major factors associated with anthropogenic factors of deforestation. Various studies in different parts of the world have indicated that the anthropogenic factors which primary causes for the loss of forests and woodlands were, wood fuel collection, clearing of forests for farms, illegal timber extraction, conflicts, increasing urbanization and industrialization [31]

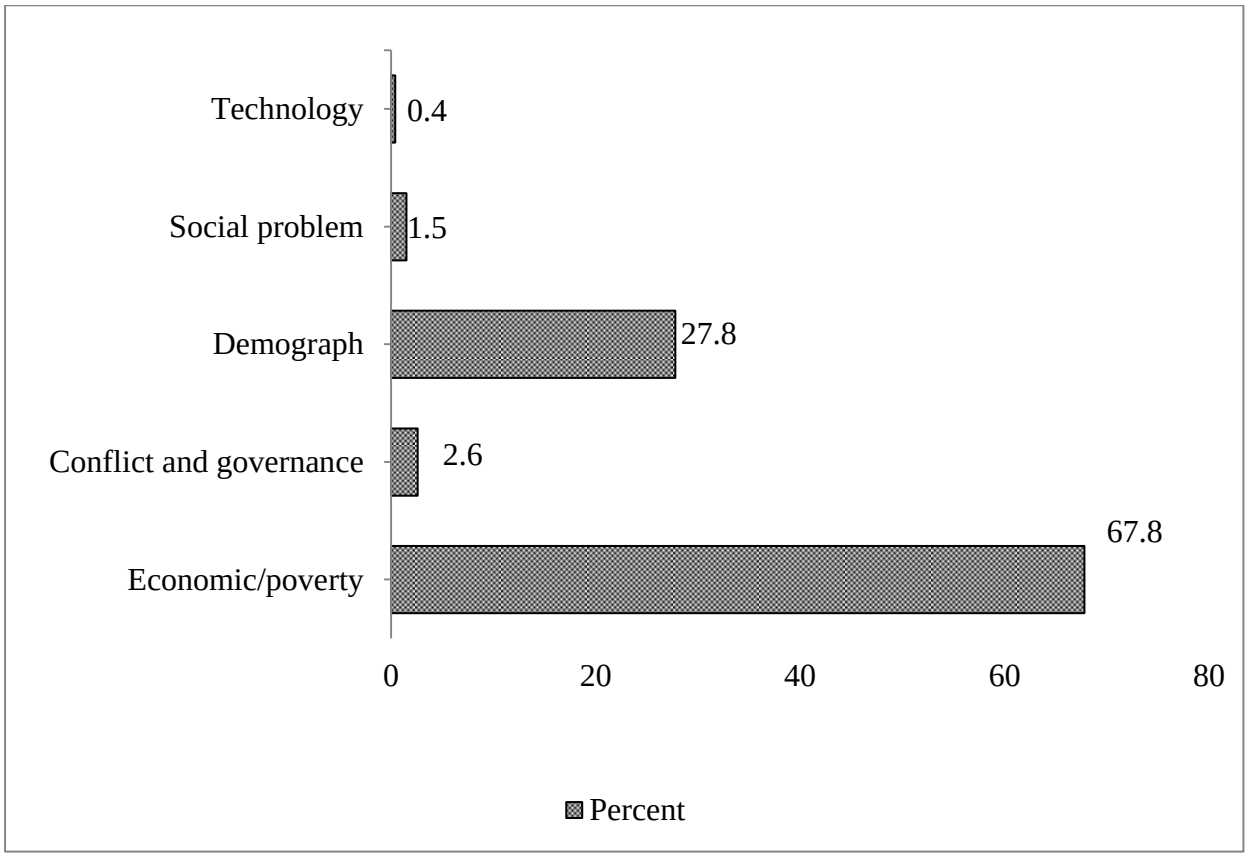

Figure 6

Chart shows types of anthropogenic factors

2.6. Strategies to Reduce Deforestation

Forest rehabilitation strategies include agroforestry; reforestation/afforestation, area enclosure/rangeland enclosure, and woodlot development are popular strategies of restoration and The REDD+ policy framework primarily targets to reduce forest emissions through addressing drivers of deforestation aiming to conserve

forest carbon stocks and to enhance carbon sequestration through implementation of REDD+ activities. Strengthen the role of customary institutions as sound rangeland management practices, Implementation of improved rangeland management practices as key adaption tool to reduce vulnerability to climate change and deforestation. Ways to diminish deforestation must go hand in hand with improving the interests of growers at the forest frontier. Any policy that does without the other is unacceptable. At most on plantation activities, the adaptive species for the target plantation site are not selected depending on the agro climate condition. All strategies require cooperation and good will. Effective implementation is essential including stakeholder participation, development of management plans, monitoring and enforcement. The strategies should be such that on one hand they should recognize the critical roles of national, state and municipal governments and on other hand empower the civil society and the private sector to take a pro-active role in reducing deforestation, often working in conjunction with government.

2.6.1. Forage Improvement Strategies

Backyard forage production, under sowing and intercropping, Forage strip establishment, over sowing legumes on grazing areas, Permanent Grass/legumes pasture establishment. Improved forage in stock exclusion areas, Natural pasture is the main source of animal feed in Ethiopia. In such a system livestock production is low and overgrazing leads to severe erosion and soil fertility problem. Therefore, more emphasis needs to be placed on producing greater quantities of high quality forage in order to fill the feed deficit.

2.6.2. Reducing Emissions from Deforestation and Forest Degradation

In the pastoralist area developing a green economy by reducing greenhouse gas emission the strategy and policies mainly focuses on: Reduction of greenhouse gas emission, Carbon sequestration, carbon storage and carbon trading and Conservation of forests, Sustainable management of forests and Enhancement of forest carbon stocks. REDD+: “plus” includes afforestation, poverty alleviation, biodiversity conservation and improved forest governance.

2.6.3. Application of Soil Moisture Conservation

As soil moisture is the most limiting factor in plant growth in arid and semi-arid regions, any mechanical and biological treatments of the range sites that could improve water infiltration will have a substantial effect on long term productivity. In general, soil conservationists working on rangeland have discovered that the best and perhaps the only method needed to control erosion is the management of vegetation and deforestation.

Figure 2: soil moisture conservation

2.6.4. Increase the area and standard of management of protected areas

Area closure/ protected areas - is a protection system to improve land with degraded vegetation and/or soil through natural regeneration, giving land complete rest and allow soil stabilization and vegetation regeneration. Many soil and water conservation and gully control measures, participatory range rehabilitation initiatives, and well-proven range management approaches are needed to restore the pastoral rangeland ecosystems for increased productivity and resilience and reducing deforestation, enhancing livelihood income in pastoralist area.

Figure 3: Increase the area and standard of management of protected areas

2.6.5. Increase Area of Forest Plantation

Increase area of forest plantation to catalyze afforestation, reforestation and forest management, development of

renewable energy sources and integrate watershed management to minimize deforestation. Aimed at conserving soil and water, vegetation cover/tree planting, rehabilitating and Area enclosure, enhancing the income and employment of opportunities Increasing the area of forest plantations by using vacant or unused lands and waste and marginal lands especially as road side, along railway tracts, on contours, avenues, boundaries and on land not suited for agricultural production should have a net positive benefit. Borana pastoralist have been experienced to reducing deforestation by using customary institution, and also Ethiopia CDM and REDD+ to catalyze afforestation, reforestation and forest management, development of renewable energy sources and integrate watershed management to reducing deforestation and promoting forest degradation.

Figure 4: Increase area of forest plantation

2.6.6. Strengthen government and non-government institutions and policies

Certain NGO's alms concerning conservation management has been immense. They have the advantage over government organizations and large international organizations because they are not constrained by government to government bureaucracy and idleness. They are eclipse supply to by-pass corruption and they are very effective at getting to the people at the frontier who are in most need. Awareness creation and training on forest conservation and management and livelihood improvements for forest dependents communities and promoted awareness about forest, capacitated locals to form new institutional arrangement that increased their participation in forest management, helped to reduce open access and assisted a regulated forest use.

3. Conclusion

Forests are one of important resources for pastoralists. Pastoralists depend on forest for fodders, foods, medicines, cultures and countless belongings. Even though, the productivities of forest resources are falling. Borana pastoralists' indigenous knowledge about forest ecology, livestock resources and social organization has developed highly efficient in forest management strategies to treaty with the high-risk environments of arid lands. Fast deteriorating health of physical environment due to unorganized and indiscriminate use of natural resources has given rise to problems which make environmental management necessary. Deforestation is the clearing away of forests by a process in which an area depleted its existing natural forest vegetation and resources. Lack of alternate resources, unemployment, ineffective forest management and government policies, Livestock grazing, black marketing of timber are main causes of deforestation in borana pastoralist semi-arid

area. Defined deforestation as: the removal or damage of vegetation in the forest, to the extent that it no more supports its natural flora and fauna. In other words, deforestation is the transformation of forest land to non-forest land. Deforestation is one of the serious problems in borana pastoral areas especially in the study area, as observed during the site assessment and observation. Consummate of the hillsides are vacant of vegetation as a result of continued destruction of the natural forests without management and protection. Pastoralist within the study area has to move long distances to chop down the first available tree to obtain wood for fuel and construction especially in Elwaye and Gomole woreda. Deforestation caused by smallholders can be reduced by providing better economic alternatives to timber harvesting or to conversion of forest to agricultural land. Deforestation has two mains demission, climate change demission and urbanization that tend people to deforestation; climate change/variability is disturbing the livelihood of the pastoral and agro-pastoral societies. Deforestation in borana pastoralist land is resulting due to concerted causes in which the harmonize causes were in population density, commercial usage, migration towards forest areas, fuel wood, charcoal, uncontrollable animal grazing, unemployment, construction of houses, poverty and conversion of forest land to agricultural land. the Strategies to reduce deforestation includes Reducing emissions from deforestation and forest degradation , Increase the area and standard of management of protected areas , Promote sustainable management, Increase area of forest plantation and Strengthen government and non-government institutions and policies. The finding described that local people embrace relevant information on vegetation dynamics that could be important for management aimed at the sustainable use and conservation of natural resources.

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4. Recommendations

- Promote tree planting (afforestation, reforestation, and agroforestry) with emphasis on multipurpose and highly adaptable tree and shrub species (primarily indigenous species)Develop appropriate land use and forest policies, strategies and programs
- Promote rural development and contribute to efforts to reduce poverty
- Prevent deforestation and forest degradation

Forest development and conservation and extension services of the government should be built on pastoral indigenous forest knowledge without overlapping with government

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