The influence of rangeland degradation on pastoral production in Togdheer region, Somaliland

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Abstract
The article reviewed the influence on rangeland degradation on pastoral production in togdheer region, Somaliland. The article described and assessed how degradation affected Somaliland pastoralism in terms of the traditional management, recurrent droughts and overgrazing of pastoralists on rangeland in Somaliland particularly in Togdheer regions. The method of the study was a systematic review. Majority of the previous studies that researchers concluded that rangeland degradation affected pastoral production negatively. At the end, I would suggest as the researcher to the government and other stakeholders would set up better intervention and response policies for the problem to improve pastoral production and save ecological diversity. Enclosures should be studied carefully before launching it, in terms of holding animal species per Hectare, water, veterinary service intervention and grass availability.

Key words: *rangeland degradation; assessment; pastoral production; Somaliland*

Introduction

This paper reviewed the impact of rangeland degradation on pastoral production in Togdheer region, Somaliland. The article is based on a literature review with a descriptive design. It was presented by reviewing and discussing more previous published articles on rangeland deprivation and pastoral production. These studies were conducted in horn Africa and the other parts of the world.

Therefore, the study aims to assess the influence of rangeland deprivation on pastoral production by focusing on the traditional management, recurrent droughts, and overgrazing of pastoralists on rangeland in Somaliland particularly in Togdheer regions.so, the need for its assessment to support policy for development and execution of control measures can therefore not be overemphasized.

Before carrying out the analysis and assessment, it is vital to apprehend the perception of land degradation: its description, kinds, and features. There are several definitions in the literature for land degradation. However, they all

involve around decrease of land resource possible due to one or a mixture of processes such as accelerated soil erosion by water or wind loss, sedimentation, long-term reduction of the amount of variability of natural vegetation, reduction of soil nutrients, increase of aridity, and salinization and sodification(Management and Towers 2007).

Pastoralism inhabits a quarter of the world land area which is
Chiefly arid and semi-arid and backs tens of millions of Pastoral families in which 60% are found in Africa. Pastoralism is an economic movement and land use system with its distinctive characteristics, and it is a method of life for people who drive most of their Earnings from keeping domestic livestock reared in Surroundings where most of the feed is natural rather than cultivated or closely supervised (Cited Desta 2006).

On the other side in the Horn Africa particularly in Ethiopia which is one of the countries that pastoralists dominate and play a key role in national GDP in terms of pastoral production. However, Pastoral areas in Ethiopia occupy two-thirds of the landmass of the Country and provide 12-15% of the country's human population and a large number of livestock (Desta 2006). In addition to that, The Somali ethnic pastoralists cover 53% of the pastoral Populationin Ethiopia followed by Afar 29%, the Borana 10%, and the Lasting 8% are found in Gambella, Benishangul and Tigray regions respectively.

It is estimated that the pastoral sector in Ethiopia constitutes of 40% Cattle, 75% goats, 25% sheep, 20% equines, and 100% of the camels. As well as Ethiopian pastoralists had faced recurrent droughts in 1973/4 which affected badly in pastoral production with high mortality of the livestock population other factors that influence pastoral production livestock include; disease outbreaks, conflict, and insecurity, which are very prevalent in pastoral areas drought, plus other interior factors such as development in human population and reduction of grazing lands to non-pastoral projects, however, these factors together turned to be the most devastating and smallest manageable problem that renders the stability and sustainability of pastoralism and pastoral livelihoods (Desta 2006).

Livestock production has been the backbone for the people of Somaliland. Livestock production is chiefly pastoral and agro pastoral employing over 70% of the population. Livestock production gives 60% of GDP and about 85%

of foreign export earnings. Livestock is the foundation of pastoral livelihoods, (Somaliland 2016).

In this case, since the collapse of the central government in Somalia, northern regions of Somalia announced their breakaway from other parts of Somalia, in this regions (Somaliland), pastoralists occupies 60% of the population in Somaliland, and their life depends on the livestock production, but pastoral production or livestock production have been facing major problems which cause many times to ban for exporting the animal to the international market and severely affected pastoralists directly, not only that, it is observed that Somaliland pastoralists face some constraints, among these factors, including repeated droughts, growing urbanization, overgrazing, cutting trees, expansion of bush and unpalatable crops, lack of planned pasture to the livestock, and government role on the worsening condition of rangeland.

Discussion

Research carried out on Somali pastoralists in Eastern Ethiopia titled by (Effect of rangeland degradation on the pastoral production systems, livelihoods, and opinions of the Somali pastoralists in Eastern Ethiopia) with an arid and semi-arid climate. The research was aimed at the description of the rangeland resources, evaluating the current situation of the rangeland, observing pastoral attitude on rangeland deprivation, and emerging drought feeding approaches for livestock. The researchers have selected three predominately areas of vegetation in Eastern Ethiopia suitable for grazing and browsing in different species of livestock and these were arid; Asbuli grassland, Aydora open savanna, and the semi-arid Hurso closed savanna. These sites used for grazing and browsing for various livestock in Eastern Ethiopia.

However, the degradation of rangeland was discovered in each of the three vegetation types. As the study mentioned that the Arid and semi-arid rangelands that work for as the resource origin for the livestock production system known as the pastoral production system in Ethiopia are under massive hazard since 1944-1974 till 2004 of recurrent droughts in Eastern Ethiopia. However, the researchers came up that the drought; dryness and rangeland degradation have enlarged over time due to environmental deprivation and maladministration of rangeland resources (Kassahun, Snyman, and Smit 2008).

As well as, changes in vegetation ecology have severely affected the livestock species composition in particular of the numbers of camels and small ruminants rather than cattle. In addition to that, this affected of the planning

and preference of pastoralists for different types of livestock which furthermore created a class of pastoralists in terms of household and livelihood style. As well as, reduction of livestock production, showing that poverty has gone up over time. Traditional supervision mechanisms are identified to be failing due to growing environmental and rangeland degradation and lack of national policies to diminish or resolve the problems that increasingly the recent years which severely influenced animal production((Kassahun, Snyman, and Smit 2008)

However, in our context, repeated droughts have affected animal production which have been the sources of pastoralists and urban people too. As wells as, the increasing desertification, mismanagement of environment, absence of governmental role, land enclosure, urbanization thought villages for unplanned roads for grass-land areas. These factors influenced by pastoralists' animal resources in the country. Vegetation and grassland in the country particularly Togdher region in Somaliland were the only sources for livestock grazing and browsing. This showed that the reduction of livestock production has affected by the above factors.so, this article have agreed with many voices and massages from different activists and institutions that stated of worsening situations on range land and desertification which led on reduction of pastoral production with the absence of government policy and traditional management .

It was observed that the recurrent droughts, dryness and rangeland deprivation have risen over time due to the environmental degradation resources in Togdheer region.

Finally, researchers have revealed the droughts, dryness have risen over time due to the degradation on rangeland and mismanagement of rangeland *to which have affected the type of livestock rearing favor of pastoralists in two pastoral areas Erer and Aysha in the Shinile zone of the Somali region in Ethiopia.* As well as, alteration vegetation ecology.

However, the other study was conducted in Kuraz district of south Omo Zone in Ethiopia to evaluate the opinion of pastoralists on livestock-rangeland management ways. People of the Kuraz district are majorly pastoralists with very low education. Only 9.6% were educated which means 90.4% of the pastoralists were non-educated.

The number of Pastoralism (68.3%) and agro-pastoralism (31.7%) were the dominant rearing systems while the sale of livestock and livestock products were graded 1st and 2nd as the main foundation of revenue among pastoralists. However, respondents of the research in the district were proved that the grassland was changed compared by the past and dominated with

bushes and unpalatable shrubs for the animal. In addition to that, the study found that the drought and overgrazing were among factors for a bush, unpalatable invasion of grassland.

On other hands, the major constraints of livestock production of pastoralists in kuraz district in Ethiopia was ranked to be drought and feed shortage of the grass land in the region one-to-one ((Worku, B, Lisanework 2016)

As the study found that there was insufficient knowledge of the rangeland resources managements means exploitation practices among them due to poor management of the elders', and repeated droughts in the region compared to past, and recurrent and poor management led to the grassland to be degraded which affect livestock production in the region (Worku, B, Lisanework 2016).

The above study has reflected nearly the situation and behavior in Somaliland pastoralists particularly in Togdheer region where are the habitant of many pastoralists. In the last 20 years, the grassland has been degraded or changed by bush and unpalatable bush which forces pastoralists to move from their locations into where they can find suitable grass for animals. Conflict on grassland increased as resources reduced. Ecosystems also had reduced due to many reasons including civil war, illegal hunting, and depriving grassland.

Togdheer pastoralists have been adapting for the last 20 years of using woods as wood which caused and took part in rangeland degradation due to poor management and lack of knowledge about the importance of grassland by the pastoralists. As well as, recurrent droughts and shortage of feed became the constraints of the pastoral production of the Togdheer which led to other problems such as poverty, and displace into urban.in the case of Togdheer region, lack of traditional management, the government role is absent from the rangeland which encouraged pastoralists to misuse the grassland and which will turn the rangeland degradation as nation constraints in the whole country. A study was displayed to survey rangeland resource practices of pastoralists and rangeland deprivation in Rayitu district, south-east Ethiopia. The method was a single-visit survey procedure was used to collect data through a structured questionnaire, group discussions and direct observations. Free grazing of communal land was 100%, use of enclosures was 89%, division of flock based on species and class of animal was 59%, migration was 79%in dry periods, and seasonal evaluation of the statues of rangeland were the basic old-style rangeland management means .

About 91% of pastoralists showed that the condition of their rangelands was deprived. The majority use for woody plants was for building followed by browse and medicinal purposes.

More than 86% of the participants considered that their grazing lands now carried more bushes and shrubs than they did 30 years ago(Abate, Ebro, and Nigatu 2010)

Forage and water deficiencies and drought were acknowledged as current constraints for pastoralists, with movement or migration looking for pasture and water for their herd.

The main handling approach, is to Restore the current rangelands needs and the progress of a rangeland supervision strategy concerning pastoralists and other stakeholders, a reduction in livestock numbers must be an essential component of any future strategy in the grass land or creating more managed communal grass land for the livestock (Abate, Ebro, and Nigatu 2010)

A study was conducted (Abule, Snyman, and Smit 2005)in the Middle Awash Valley of Ethiopia. The aim was to evaluate and comparing the broad views of two pastoral ethnic in Ethiopia on the practice of the current rangeland resources, and their understandings on limitations and constraints with possible solutions the problem in region.

Researchers were collected the data from 90 Oromo and 55 Afar households. Although both of these groups share common problems in terms of range based problems and livestock production. So, the research revealed the pastoralist develop their key income from the sale of animals and animal products, both pastoral groups (Oromo &Afar) depending deeply on native grasses for animal feed and to a lesser extent on woody plants as a source of browse.

The majority of participants that have been taken part of the study stated that the situation of the rangelands is going to worse according to the past time of rangeland, mainly due to overgrazing, droughts, and growths in the human inhabitants.

On the other hand, the accessibility of water could be a problem in both regions in Ethiopia.

in addition to that, migration was counted as one of the problems among pastoralists particularly during drought and harsh time Oromo to Afar areas which led by feed shortage due to the limited resources and great number of pastoralist in the Middle Awash Valley(Abule, Snyman, and Smit 2005).

In Togdher region, it was observed that overgrazing, shortage of water, un-planning urbanization in rangeland and migration due to lack of resources

Become the constraints of pastoral production section in the region which could be agreed on the research while there was no empirical research conducted the matter which officially confirmed.

A study conducted in two tropical tall grass regions of northern Australia titled by (How land condition alters plant-animal relationships in Australia's tropical rangelands in northern Australia). The objective of the study was to investigate the influence of a change in land condition on herbage and animal production. The result had revealed that the Alterations in vegetation composition and land conditions that happen in response to grazing in natural grassland systems may change plant and animal production.in order to formulate the hypotheses, researchers have chosen different grassland classes in the target areas in Australia.(A. J. Ash et al. 1995).

According to (Tilahun et al. 2016) in a study attitude of pastoralists on the practice and preservation of rangeland resources in Afar Region, Ethiopia . Researchers used household examination, focus group discussion, key informant interview, and individual questionnaire to comprehend the views and attitude of Afar pastoralists to rangeland resource practice and preservation policy, as well as influences of growth involvement on traditional rangeland resource use and conservation practices. The data were analyzed using index ranking and descriptive statistics.

Thus, the results showed that livestock productivity was adversely affected by some factors such as the invasion of Prosopisjuliflora (garan-waaama geed yahuud), the decline in the size of rangelands and frequent droughts. Lack of grazing resources attributed to the invasion of Prosopis juliflora and drought generated livestock feed disaster with a strong effect on the livelihood of pastoralists. A study found that the traditional resource supervision practices such as movement or migration, herd splitting, and variation had a role to provide to the development of rangeland management and preservation of biodiversity. Traditional guidelines and seasonal-based grazing forms of riversides during drought were perceived as key elements for rangeland resource management and preservation of rangeland resources in the study area(Tilahun et al. 2016)

They were selected along fence-lines separating enclosures or paddocks with different grazing histories. Researchers were graded as state one which was dominated by palatable tussock perennial grasses and State two as a less palatable tussock perennial grasses, annual grasses and forbs as the major species. State II or paddocks one produced considerably less herbage than State I or paddock two. Cattle were grazed the two paddocks, land condition

classes to accomplish comparable exploitation rates over the range 5-60% utilization in a number of 8 week seasonal grazing periods over 2 Years.
Finally, the study revealed that cattle in state one grassland have shown greater growth compared with the cattle that were grazed in state two grasslands.

Therefore, The reason for that; is to possess the differences in pasture productivity between land condition classes, comparable levels of utilization were achieved by imposing dissimilar stocking rates in grassland. In other words, the difference in grassland quality, palatability, and stock rates may determine and influence the production of livestock and rapid growth. This could be suitable if grass were managed and protected by factors that impact by the rangeland. However, the study identified that the high stocking rates, animals in the State II behavior had less available fodder on offer, causing in lower live weight gains related with State I. this may change the land condition and productivity in the grassland because of the great number stock and less fodder for the animal resulting misbalance of the between the feed available and the animal, which could harm the rangeland itself(A. J. Ash et al. 1995).
In Togdheer region, rangeland is communal area where different species of animals are overgrazed in communal areas which cause land and grass changes due to the heavy grassing specifically during shortage of feed or where pastoralist migrated looking for feed and water.

A case study from Northern Kenya revealed that the rapid reduction in fodder quality in the dry season is the essential factor shaping livestock production and pastoral land usage forms. The findings of a principal analysis pointed out that rangeland degradation does not happen in most of the range elements considered because feeding is incomplete to a short period in a year. Indifference, the few range components with a good perspective are susceptible to deprivation when formerly mobile pastoral households become overgrazed these key resources. As the study has identified, that carrying capacity facts misjudge the potential livestock-supporting capacities in grassland in Northern Kenya(Hary et al. 1996)
However, Destocking rangelands would result in a serious deterioration in the productivity of pastoral production systems and is not likely to stop rangeland degradation. It is concluded that land usage policy involvements in Northern Kenya should not emphasis on the manipulation of absolute livestock

numbers, but rather on the ideal distribution of animal abundance in space and time(Hary et al. 1996).

This study used a grouping of remote sensing data, field observations, and evidence from local people to examine the shapes and dynamics of land-use for 35 years from 1972 to 2007 in the arid and semi-arid Northern Afar rangelands, Ethiopia. Researchers have been used as a pixel-based managed image sorting to plot or map land-use. People's views and ecological time-lines were used to clarify the driving forces linked to the deviations or change in grassland.
The study revealed a speedy decrease in woodland cover with 97%, and grassland cover with 88% happened
between 1972 and 2007 (Tsegaye et al. 2010)
Bush land cover enlarged more than threefold, while the extent of farmed land increased more than eightfold. Bare land increased moderately, whereas bushy grassland and scrubland remained unchanging. According to accounts from indigenous people, major events that largely explained the changes include: (1) severe droughts in 1973/74 and 1984/85; (2) escalation in dry years during the last decade; and (3) immigration and increased sedentarization of pastoralists(Tsegaye et al. 2010)
However, if the present land-use cover change were to continue, joined with a drier climate, people's livelihoods will be highly affected and the pastoral production system will be under increasing danger and this will harm the country's economy (Tsegaye et al. 2010).

A study in northern Australia revealed with the title of How to season of grazing and herbivore selectivity influence monsoon tall-grass communities of northern Australia
The assumption was that the period of overgrazing and herbivore selectivity may be as important as the level of use in the influential plant community response to grazing was tested in a monsoon grassland in northern Australia. Researchers found that the medium and high levels of exploitation in the early wet season, the pasture responded negatively to defoliation, only partially compensating for plant tissue lost to herbivory. The negative response to overgrazing carried over to the next wet season when these same media and high-grazing dealings produced only 80 % and 60 % growth, respectively, of that in treatments grazed at low levels of utilization or those grazed during the dry season (Andrew J. Ash and McIvor 1998).

So, in plots that had been grazed at a high rate of utilization for just eight weeks in the early wet season for the two years previously. Species richness and diversity were also significantly affected by this grazing disturbance. If species components are to be preserved in these grasslands then stocking rates must be set at low levels to manage with the joint effect of under equilibrium in response to overgrazing in the wet season and strong eating favorites for feeding sensitive species. In other saying to this point, is that overgrazing in specific grass or grassland or a great number of animals in specific areas would cause range degradation, and that also would be constraints in animals' production(Andrew J. Ash and McIvor 1998).

Land deprivation is under the change, negative environmental process that is enhanced by human-based activities in Somalia. It's changing in nature consents degradation to continue unnoticed, thus reducing the likelihood of appropriate and timely control action. Presently, there are few useful policy to help countries design national strategies and policies for its control.

This study was presented and established a framework for the national assessment of land degradation(Omuto, Balint, and Alim 2014)

The study have used time-series remote sensing data to classify the degree and extent of land degradation, indigenous specialists recognized predominant degradation types and drivers of the degradation and field observations to confirm the general assessment. Its easiness, use of freely downloadable input data and self-triangulation of the assessment methods make it suitable for rapid assessment of land degradation on a national scale. It was tested in Somalia, where it exhibited accuracy greater than 60 per cent when assessing land degradation.

This framework is relevant for planning national approaches and policies that address land degradation and provided an opportunity for accurate identification of areas to target with comprehensive local assessment (Omuto, Balint, and Alim 2014).

However, the researchers indicated that the Testing of the framework in Somalia showed that about one-third of the country was degraded because of loss of vegetation cover, topsoil loss, and the failure of soil moisture. Overgrazing in the grassland with a large number of animals, unnecessary tree cutting, and poor agronomic practices in agricultural areas was identified as the primary drivers of the country's land degradation.

These drivers are encouraged by the prevailing communal land freehold practices, with the absence of the role governance and civil war which

decrease the role of traditional management practice of the grassland(Omuto, Balint, and Alim 2014).

A study approved out in southeastern South America In particular, the practically treeless landscapes of the Campos with the question (Why are forests so scarce in subtropical South America? The shaping roles of climate, fire, and livestock).

The study aimed to evaluate tree cover to source availability such as climate, soil fertility, soil water holding capacity, disturbances such as fire occurrence,

Cattle grazing and landscape features that can mediate the effects of both topography, distance to rivers by using remote-sensing information and spatial regression models to understand the extent of the relation among the factors, therefore, the researcher found that the tree cover in southeastern South America increases with rainfall but is decreased by livestock densities and fire occurrence in areas (Bernardi et al. 2016).

In addition to that, Forests are focused close to rivers, especially in the Campos region, where cattle grazing seems to prevent tree expansion into the grasslands which seems that the overgrazing and over stocking was affected on rangeland and trees expansion(Bernardi et al. 2016).

A study in southern Africa titled by Semi-arid and arid rangelands: a resource under siege due to patch-selective grazing. The study aimed to evaluate the spread of selective grazing in particular areas and subsequent patch overgrazing is considered as the main reason for the continued deterioration of semi-arid and arid rangelands worldwide. If current levels of patch overgrazing are not reduced substantially, the sustained worsening of semi-arid and arid rangelands will not be stopped. Effective elimination or substantial reduction of differential forage utilization in semi-arid and arid rangelands will greatly increase livestock production and encourage the protection of rangeland resources (Fuls 1992).

An investigation in southern Brazilian Campos to provide by addressing the practical roots being used by legislation concerning access to land and encouragement to production and their consequences for natural grassland systems while the Existing policies are to have a production-oriented focus trying to support livestock productivity by setting smallest stocking rates to be applied in grasslands to avoid the grassland degradation in the environment(Carvalho and Batello 2009).

However, researchers that there were overgrazing and reduction of natural grasslands. Thus, there is a need for adapting admission to land legislations to

the new environmental functions expected for natural grasslands which allow herders and agricultural families to minimize the range degradation. Combined measures are proposed, which could help solve the contradictory compromises regarding the incentive of production and the promotion of natural resources preservation in the environment.

Conclusion

As a result of recurrent drought in Somaliland due to the climate change, lack of government subversions on the equilibrium theory of environment by protecting the ecosystem of land which minimize degradation of the of land components particular grassland to which pastoralists depend on, the fragmentation conflict of the central Somali government paved the breakdown of traditional management of the elders that took the responsibility of protection for the rangeland in Somaliland particularly in the Togdheer. According to the Somaliland National policy for the livestock ((Somaliland 2016), which stated that Somaliland obtains rainfall ranging between 100 - 300mm per annum. The rainfall is irregular and unevenly dispersed both spatially and temporally. So, the irregularity of the rainfall in Somaliland led to the pastoralists affected which, then caused movement and migration to where water and feed are accessible.

Recent research indicated that rangeland degradation in horn Africa influenced pastoral production as well as, the studies found the causal relationship between the rangeland degradation and pastoral production which resulted in poor productivity in livestock production and low-income pastoralists. The proposed national land degradation assessment frame-work was applied in Somalia, where it is shown that about one-third of the country was degraded because of the damage of vegetation cover, topsoil loss, and deterioration of soil moisture. In addition to that, it was also acknowledged overgrazing, unnecessary cutting of trees for energy, and poor agronomic practices in agricultural areas as the primary drivers of land deprivation in Somalia. These drivers are urged by the dominant communal land tenure practices, poor governance, and civil war in the Country which influenced directly by pastoral production. Therefore, studies that were conducted in Horn Africa agreed that the drivers of the rangeland degradation are; maladministration both government and traditional management for protecting the land, recurrent droughts, migration among the pastoralist, expansion of unpalatable trees and bush, and overgrazing.

These drivers of the rangeland degradation are assessed and observed in Somaliland as a whole particularly in Togdheer regions due to the lack of

management both government and traditional for protecting the land, repeating droughts, irregular movement among the pastoralists, expansion of unpalatable trees and bush, and overgrazing in the region.

Finally, according to the Somaliland livestock policy, a workshop held in Hargeisa with other stakeholders in 2003-2006 proposed four main constraints, among the four constraints; is natural constraints which consist of livestock disease, rangeland degradation, and inadequate and irregular rainfall. These constraints still exist in Somaliland and it was solved by stakeholders.in addition to that, it was not a prepared Development policy to overcome the constraints facing Somaliland pastoralism. There is no studies and assessments about the constraints particularly recurrent drought and worsening condition of the rangeland in the country by the stakeholders while experts in the field are believed that the condition would be shifted into the 'national threats'.

The recent years, Somaliland launched a so-called program development for livestock by creating national enclosure (seero) in Togdheer (aroori) Mardijeex (qoolcadey) and other regions funded by SDF (Somaliland Development Fund), but these program development for livestock did not become fruitful. Some of them are under the building. But Before that, there were no studies about these national enclosures in terms of the number of livestock and species if they are a match or not and planting vegetation policy within the enclosures in the country.

Thus, the government and other stakeholders would set up intervention and response policy for the problem to save pastoral production and ecological diversity. Enclosures should be studied before launching in terms of holding animal species per Hectare and water and grass availability. To reduce rangeland degradation, the government and other stakeholders should design a plan for the growth of human Arabization and unnecessary roads in grassland areas. As wells as, invasion of unpalatable grass in the pasture.

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