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ASSESSMENT OF RANGELAND RESOURCE UTILIZATION AND MANAGEMENT PRACTICE ON PASTORALIST IN AFDEM DISTRICT OF SITTI ZONE, SOMALI STATE, ETHIOPIA

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Abstract: This study was conducted to assess rangeland resource utilization and management practices, specifically to assess the effect of drought and conflicts over rangeland resource, expansion of unwanted plants species, in Afdem district located in sitti zone, Somali regional state of Ethiopia. In this study, Pastoralist rangeland resource utilization practices were assessed using structured questionnaire (50 households), visual observation and group discussions, The data obtained through the questionnaire from assessment of rangeland resource utilization and management practice were analyzed by using SPSS version 16 by using description statistics like frequency, percentage then presented in the form of tables. Nearly, majority of the respondents were lack of education (illiterate) and pastoralism was the most dominant production system in the study area. The natural grazing land was more important and only source of livestock feed and there is no privately owned land and also most of the respondents preferred communal ownership of the grazing land for the period of time that is to come. The most common rangeland and livestock management practice strategies adopted by the pastoralists included seasonal migration, herd splitting, range classification and soft grazing as mentioned by the majority of the respondents. So strengthening of the pastoralists' indigenous knowledge through giving attention and recognition, as well as organizing awareness creation programs on proper rangeland management and improvement measures which suitable to the area must be undertaken. In the district, expansion of rain fed crop production might be full of risks, because of the uncertain of the rainfall as well as the nature of the community.

Keywords: Rangeland, pastoralist, management practice, coping mechanism, pasture periodic assessment

1. INTRODUCTION

Rangelands, defined as uncultivated land that provide the necessities of life for grazing and browsing animals, make up about 50 to 70% of the world's landmass of which over 50% are arid and semi-arid (Holechek et al., 2001). In Africa, rangelands are the major sources of feed for ruminants and constitute about 65% of the total land area which supports 59% of all ruminant livestock (Friedel *et al.,* 2000). In Ethiopia, rangelands are located around the periphery of the country and most of these areas are found below 1500 meter above sea level (Friedel *et al.,* 2000). They cover about 61 to 65% of the total area of the country and are characterized by arid and semi-arid agro ecologies; experience a relatively harsh climate with low, unreliable, and erratic rainfall, regularly high temperature and low human population density (Alemayehu, 2004). Many of these rangelands based life style at present, are shrinking and degrading due to natural and man-made causes such as increase in human population, bush and crop encroachments, settlement, conflicts, and recurrent drought.

The Ethiopian pastoralists belong to 29 ethno-linguistic groups: the three major ones being Afar, Oromo and Somali; all belong to the Cushitic ethno-linguistic family, making up 90% of the rangeland population (PADS, 2004). So that Livestock feed source is one of the major factors that contribute to the low productivity of livestock. So rangeland resource must provide important nutrients such as energy, protein, vitamins and minerals for all classes of ruminants in order to fulfill maintenance production and reproduction requirements.

The rangeland resources utilization and management practice has in afdem district has witnessed to be an opportunity for better livestock production and better livelihood condition and challenges for survival to the existing pastoral production in the area (Fikirte, 2008). The mobile nature of the pastoralists and the poor road network has hampered the expansion of development endeavors like water, health and research activities in the district (Fikirte, 2008). Furthermore, the frequently droughts that occurred in the Afdem district and the migration of livestock from the neighboring districts in search of feed and water have created a great pressure on the rangeland resource. According to (Fikirte, 2008) the migrations of livestock from the neighboring districts have created conflict among afar, Somali and Oromo ethnic groups regarding rangeland resource utilization. The decline in rangeland resource in the district has affected the livelihood of the pastoralists and has made them very vulnerable to every climatic shock (Fikirte 2008). Therefore the objective of the paper was assessed traditional management practices of rangeland utilization and livestock, the effect of drought and conflicts over rangeland resource identified major invasive plant species and their limit measures in the study area.

2. REVIEW OF LIRETAURE

Rangelands provide multiple functions as a habitat for a wide array of wild life species and for diverse and wide range of native plant species. Pastoralist is one of the oldest socio-economic systems in Ethiopia, in which livestock husbandry in open grazing areas represents the major means of subsistence. The majority of pastoralists come from the Somali, Afar and Borana ethnic groups. There are also other ethnic groups living in the Southern Nations, Nationalities and Peoples' (SNNP) Region, and in the eastern, western and the north-western parts of the country Among them, it is estimated that 93% are considered to be pastoralists, while the remaining are either hunter-farmers or pure farmers (Beruk and Tafesse, 2000). Pastoralism has been considered as a sustainable mode of resource exploitation in dry land areas and pastoralism based on human and animal mobility is an ecological response to harsh conditions of an arid environment and such practices also can and should play an important role in maintaining rangeland biodiversity (Gliessman, 2005).

Ethiopia is estimated with the highest livestock population in Africa and tenth in the world. Accordingly, the estimated number of livestock population includes about 40 million cattle, 28 million sheep, 20 million goats, 4 million camels, 4 million equines and 52 million chickens (CSA, 2004 as cited by Amaha, 2006 and fikirte, 2008). Pastoralists account for about 42% of the total livestock population of the country (Mohammed and Associates, 2001). The loss of traditional indigenous knowledge and decline in the participation of the elders regarding rangeland use are among the major problems for the present day rangeland degradation in most parts of Ethiopia (Gemedo, 2004). The traditional resource management practices of the pastoralists that regulate the sustainability of the natural resource are diminishing through time (Gemedo, 2004). Also according to (lishan,2007) Some of the factors that contributed to this situation are the absence of trust on the indigenous knowledge by development partners, encouragement of pastoralists for farming through settlement programs and peasant associations and past development interventions that did not involve the pastoralists (like the construction of more water facilities). One of the main intervention areas of the previous development projects was tackling water scarcity in the rangelands that created free access to water sources. But, these schemes had no traditional or local resource management bodies and resulted in the weakening and collapse of traditional water well use and control system as well as institutions that controls access rights to natural resources. The presence of excessive water points all over the grazing areas have led to uncontrolled misuse and overuse of grazing land resources in dry and wet season grazing areas (Getachew, 2000). Several authors (Alemayehu, 2004; Gemedo, 2004) suggested that traditional grazing management system was an important copping strategy for the most pastoralists of the country to safe the rangeland resource and feed availability.

According to Friedel *et al*. (2000), rangeland resources are enormous but the ecosystems are fragile requiring appropriate management strategies to ensure sustainable productivity. Animal production through pastoralist and wildlife management are the main form of rangeland use with a few agro-pastoralisms. Extensive review works by Beruk and Tafesse (2000), Abule (2003), indicated the lowlands to be rich in water, mineral, energy and aquatic resources. The different water resources have potential for consumption, irrigation and as sources of energy. Furthermore, the rangelands have potential in terms of natural gas deposit, geothermal energy, metallic, and non-metallic minerals. Not only livestock, but also the presence of many national parks and wildlife sanctuaries in the lowlands are a clear indication of the potential of the rangelands for conservation activities.

3. MATERIAL AND METHODS

3.1. Description of the Study Area

Afdem is one of the districts in the Somali Region of Ethiopia which is located in Sitti Zone. The district is bordered on the southwest by Mieso, on the north by the Afar Region, on the east by Erer, and on the south by the Oromia Region. Based on Jijiga meteorological office information, Afdem is located between latitudes 10021"N, and longitudes 41022E". The pastoral areas of the district are situated at an average altitude of 1,057 meters above sea level. The features of the district are somewhat rare version of a highland climate with warm, but not hot, summers and cool winters. The town is known for its pleasant climate during the summer periods; between mid May and early September. The annual high temperature is an average of 27.7 °C and low 13.5 °C (CSA, 2017). Afdem consists of undulating hilly parts interspersed with expansive plains. A rugged undulating area covered by bushes and seasonal farming is found around the foot of the Chercher mountains in neighboring east Hararghe. The area is a low-lying flat semi-arid area to the north- central area of the Sitti zone, with loose soil and covered by bushes and woody grasses. These vast flat areas provide grazing area for cattle and sheep. Hilly, stony and undulating areas the interrupt these plains also are found in the district which are uses for goat and camel herding (SC-UK, *et al*., 2002). Afdem district has an estimated total human population of 37,411 (17,736 males and 19,675 females) (CSA, 2005).

3.2. Sampling techniques and Sample Size

Eight of the 30 district Pastoral Associations (PAs) were selected based on availability and rep-resentativeness of grazing land and rangeland capability. From the selected PAs, a total of 50 households were chosen at random and objective of the survey was explained and discussed with the informants in order to ensure their cooperation. In each of the selected PAs Team of the field research directly collected the data from the study area and single-visit formal survey (ILCA, 1990) collected the data.

3.3. Method of Data Collection

As started the assessment of this survey, secondary data related to the study was collected from all possible sources. Furthermore, visual observation and group discussions were held with the elders, development agents and district officials to obtain relevant information on rangeland resource utilization and management practice. The group discussions focused on assessment of land ownership preference, management practice, adequate of water, household labors, major problems of invasive plant species, control measures, solutions, rangeland use conflict, etc. The information gathered through the FGD used as basis to emphasis a structured questionnaire which was prepared to measure the most important parts of the study and hence to have an overall understanding about the rangeland resource, utilization, and management practice in the pastoralist. To collect relevant information regarding traditional range resource utilization practices, available resources, grazing land utilization practices, effect of drought,

methods of drought coping mechanisms, water resources for livestock and mobility of the family), income sources, migration, problems concerning grazing lands and possible solutions a well-structured questionnaire was prepared. In the prepared questionnaire there were open-ended (gave the respondents chance for self-expression to share their views, experiences and opinions), single and multiple response questions. Single response questions were those questions where the sampled household had a one reply and multiple response questions the type of questions where the individual household can give more than one reply to a given question.

3.4. Method of data analysis

For this study descriptive statistical analysis was adopted to assess the major findings of the study. Quantitative data that was taken by questionnaires was analyzed statistical package for social science SPSS version 16.0 software, by using descriptive statistics method such as percentages, frequency then presented in the form of table. While qualitative data was analyzed using inferential statistics and presented in the form of verbal and narration.

4. RESULTS AND DISCUSSION

4.1. Household Demographics

Table 1: Households Socio-Economic and Demographic characteristics

Major categories		Frequency	Percentage
Gender	Male	44	88%
	Female	6	12%
	Total	50	100%
Age	20-30	1	2%
	30-40	17	34%
	40-50	31	64%
	Above 65	1	2%
	Total	50	100%
Marital status	Married	34	68%
	Single	12	24%
	Widowed	2	4%

	Divorced	2	4%
	Total	50	100%
Educational	formal education	1	2%
	Informal education	5	10%
	Illiterate	44	88%
	Total	50	100%

Source: Field survey

The age of the respondents ranges from 20-above 65 years. Where the majority of the respondent were 30-50. And also mostly were male. This was because males were the heads of household and females are not allowed to respond on represent of the family due to strong cultural practice limits. As the result of the study, the majority of the respondents were illiterate, only a few of them had got informal education. Which indicate a low status of education which might be the condition of many pastoral areas of Ethiopia (Abule, 2003; Admasu, 2006). On the other hand most of the respondents were married. This marital status is very common in the pastoralists of the area. Generally this result was in relate the studies by (Lishan, 2007 and fikirte, 2008), in Dembel , shinile, and afdem respectively.

4.1.1. Source of income

Table 2: Source of income

Type of source	**frequency**	**percent**
Sale of animals	25	50%
Animal products	10	20%
Both livestock and their products sale	13	26%
Off-farm	2	4%
Total	50	100%

The main source of income for the respondents in study district was from the sale of live animals, animal products (milk, meat and skin) both livestock and their products sale, where the few people depended on off-farm. This result was agreement with the report by (fikirte, 2008) who indicated that the main source of revenue for the pastoralist in the Afdem district is the sale of live animals, animal products, both livestock and their products sale, and few of them depend on the off-farm and was also in line with the former findings from the different studies of pastoral communities of Ethiopia (Ahmed, 2006; Belaynesh, 2006; Teshome, 2006; Lishan, 2007).

4.2. Household labor organization

In the study district there was a obvious division of labor among individuals of the family, based on the gender and age. Men are largely responsible for long distance herding of large ruminants, building and repairing of livestock pens, marketing of livestock, gathering information, participation in clan meetings, conflict mediations and pasture periodic assessment (known as *sehan).* Women are responsible for herding small ruminants. In addition, women operate all domestic activities including clearing, washing and fetching firewood and water. Other piece of works for women include, milking (mainly small stocks) and building and/or repairing permanent shelters. Younger children assist their families by looking after calves, kids and other various activities among the family. Older children play the role of the women or men according to their gender. Actually this finding was in agreement the studies by (fikirte, 2008) who stated that lighter and home based tasks are undertaken by women and heavier and long distance based tasks are undertaken by men among the pastoralist of afdem district. Similarly, a report by (Amaha,2006) regarding the Erer district of ziti zone revealed that, males of younger age groups are mostly engaged in livestock herding and responsible for fetching feed and water for the animals, while older people (men and women), as well as young children remain in the villages. Young animals are kept close to the village premises and taken care of by young boys, girls and women.

4.3. Land ownership preference

The Afdem pastoralists revealed there were no privately owned lands and such practice is strictly forbidden in the study area. Even if, the result of vegetation cover in the grazing areas of the study district revealed that their grazing lands are deteriorated. Furthermore the majority of the respondents in the district chose communal ownership of the grazing land for the future and only few preferred private ownership. Contrary as reported by (Lishan, 2007) the Shinile and Dembel district chose private ownership and their tendency for cultivation was the additional reason given for their choice. In the district, the reasons for the preference of communal land ownership are to utilize different grazing areas as they want in different time of the year and traditionally they believe people having the same religion with the same culture and clan should have to live communally and also they have strong believe on land as the gift of God for all *Issa* pastoralists.

4.4. Rain fall pattern and water source

Table 3: Water Inadequacy and options for inadequacy

Is the water source adequate all the year?	**Frequency**	**Percent**
Yes	8	16%
No	42	84%
Total	50	100%
Months of water inadequacy	**Frequency**	**Percent**
October-June *(jilal)*	14	28%
February-April (kelisha)	18	36%
May and June (Haga)	13	26%

December up to June	5	10%
Total	50	100%

Source: field Survey

The pastoralists in the study area consider water as perhaps the most fundamental resource because trekking of livestock to water sources is among the major duties for the members of the community. As indicated by the pastoralists, the rainfall condition in the study area has been generally uncertain and unevenly distributed and there is no adequate water source as the respondents stated the amount of water in the area was inadequate during the months, mainly in February-April *(kelisha),* October-June (jilal), May- June (Haga) and from December up to June as these are the very warm months in the district respectively. So this findings near to the (fikirte, 2008) in sitti zone who said the main sources of water in the area for both human and livestock use are "rain (which accounted large portion), river-side and Ella" and also decide migrate in during dry season to the grazing and water availability area in oder to sustain both human and livestock population. Although, the migration time differ depending on the amount of water and fodder in the area the pastoralists travel far distances to fulfill their water requirement. In addition to that this result also linked the one was reported by (Lishan,2007) in sitti zone, who indicated that the most pastoralist of the zone travel very far distance to obtain water and feed during the months February up to April due to in adequate of water.

4.5. Traditional rangeland and herd management practice

Table 4: Traditional rangeland and Herd Management practice

How do you manage your herds?	**Frequency**	**percent**
Herd splitting	26	52%
Seasonal migration	24	48%
Total	50	100%
How do you manage rangeland (traditional)?	**Frequency**	**percent**
Range classification	30	60%
Soft grazing	20	40%
Total	50	100%

Source: Survey field

In the study area community mainly were used two major indigenous methods for the management of rangeland resource which were herd splitting and seasonal migration to avoid intensive grazing pressure. Similarly, (Fikirte, 2008), in the Afdem district, indicated that the pastoralists have their traditional herd management practices which was mainly allocation of livestock according to distance from water points, vegetation type and based on the land form, camels and goats are grazed mainly in the mountainous parts of the district particularly during dry season . This also links to the ones reported by (Abdurrahman,

2004) in Dembel district that the pastoralists have adopted strategies that are dispersing their livestock herds into milking herd(*IRman)* and dry or non milking herds(*Gudan)* groups, based on the frequency of watering, and the availability of good grazing and browsing grounds. Also in the district range classification and soft grazing were mainly practiced as the traditional rangeland management practice as indicated above. So this findings also relate the ones was reported by (Lishan,2007) in Shinile and Dembel districts that revealed the communal rangeland management and private ownership of the pastoralist land were used as traditional rangeland management practice. In similarly also (Oba and Kotile, 2001b) indicated that the Pastoralists have their own traditional ecological knowledge to classify rangelands and assess range condition trends.

4.6. Effect of drought on Rangeland and livestock

Table 5: Effect of 2015 drought on livestock and rangeland in afdem district

What is the effect of drought on livestock?	Frequency	percent
Death of sheep	20	40%
Death of goats	24	48%
Death of oxen	5	10%
Death of cow	1	2%
Camel	0	0.0%
Total	50	100%
What is the effect of drought on rangeland?	**Frequency**	**percent**
Changing the land	17	34%
Burning the grass root	11	22%
Distraction of herbaceous layers	10	20%
Erosion and bush encroachment	12	24%
Total	50	100%

Source: Field Survey

In the district, drought is identified as the main cause, which often exacerbates the problem of food production, distribution and access, within an already difficult environment of fragile ecosystems. So the percentage number of goats and sheep that died per household during the drought of 2015 was the highest, which are the most susceptible livestock in droughts. So this might be attributed sheep and goats are not able to migrate far distance from the homestead during the drought period. That followed by oxen and cows where the camels were the most drought resistance. This finding line with current study of (Abate, *et al*.2010) who stated that Frequent and prolonged drought has been the most important natural threat that impacted on the livelihood of pastoralists, remaining a major cause of famine in Rayitu district for many years. In similarly,(Fikirte, 2008), revealed that the most drought tolerant animal is camel, thus can sustain longer watering interval of 1015 days through compensating water and feed requirement by feeding cactus species. in addition to that as pastoralists indicated the major effects of drought on the rangeland are changing the land , burning the grass roots and Distraction of herbaceous layers and also

there land erosion and bush encroachment as showed in the above table.

4.7. Major drought coping mechanisms

Table 6: Drought coping mechanism of afdem pastoralists

What you do when droughts come?	Frequency	percent
Sell of animals	10	20%
Seasonal Migration	25	50%
Herd splitting	15	30%
Total	50	100%

Source: field survey

The study area, drought has increasingly become the major deterring factor of pastoral production. When a drought occurs, it substantially increases livestock mortality. The most type of practice pursued by Afdem herders in the face of drought were seasonal migration and herd splitting. In this case, animals kept in different areas and near different relatives of nearest clan, these reduce the impact of livestock pressure on scares resource and minimize risk, while few people sell of their animals to cope the affects of droughts. So this finding relate to the report by (Futterknecht, 1997) who said, pastoralists have various coping and adaptive strategies in response to a disaster and coping strategies vary among different households in a given community depending on capabilities to respond to food stress due to drought. Also as (Lishan, 2007) reported sale of animals migration and clan interdependence are the most important drought coping mechanism.

4.8. Livestock feed source and cause of depletion

Table 7: Livestock feed sources and cause of depletion in afdem district

Do you give supplement animals?	Frequency	percent
Yes	14	28%
No	36	72%
Total	50	100%
Do you conserve feed for dry season?	**Frequency**	**percent**

Yes	14	28%
No	36	72%
Total	50	100%

Constraints of livestock feed	**frequency**	**percent**
Over grazing	24	48%
Drought and shortage of rain	20	40
Erosion	6	12%
Total	50	100%

Possible solutions of these problems	**frequency**	**percent**
Rehabilitate the eroded land	25	50%
Train the pastoralist about cultivation	12	24%
Terracing and conservation of water	13	26%
Total	50	100%

Source: field Survey

Rangelands have been the major and only source of feed for livestock in the study area throughout the year. However, the progressive reduction in grass cover may put serious constraints on animal feed and their productivity. This in turn could result in severe soil erosion. Therefore, the relative increase in migration could be a response to this problem in order to safe the required food demand of the society. In addition to that, as respondents revealed the afdem do not give supplement their animals. As discussed the pastoralists little detailed the reasons for not supplementing that the animals are not able to move one area and having many group of animals so that they can't supplement them. This study also showed that most of the districts do not conserve feed for dry season as above table. In contrary to the fafan zone of the Somali Regional State, the major sources of livestock feed were crop residue, hay, grazing land and standing hay during the dry season (Belaynesh, 2006). Similarly to the reports in other parts of SNRS (ahmed, 2003 and amaha 2006 ;). The study area pastoralists responded, there was a deterioration of the grazing land. As result the feed sources were reduced and the main issue for decline in amount and deterioration of the quality of the feed resources were primarily over-grazing, that followed by drought and shortage of rain fall and erosion as showed the above table. Thus, this study presented possible solutions to the problem of animal feed as perceived and proposed by the respondents. The majority of the

respondents proposed rehabilitation of the eroded land, Train the pastoralist about cultivation, terracing and conservation of water source as the main solution to improve the rangeland resource.

4.9. Pastoralist Conflict over rangeland resource and Resolutions

Table 8: Community conflict over rangeland resource and Resolutions

Involved pastoralist in conflict	**frequency**	**percent**
With Oromo and Somali	20	40%
With afar and Somali	16	32%
With Somali clans	6	12%
No conflict	8	16%
Total	50	100%
Conflict resolution mechanism	**frequency**	**percent**
Community elders	18	36%
Government interference	4	8%
Both government and community elders	10	20%
Not resolved still	18	36%
Total	50	100%

Source: field survey

Pastoral areas are full of conflicts due to rangeland resource utilization; inter-community conflicts arise between Afdem pastoralists with the neighboring ethnic areas as the above table showed. Such conflicts mostly relate to competition over resources such as land, cattle and water points. Since amicable relations between Somali and neighboring communities of Afar and Oromo took the form of cross-territory resource sharing. This finding lined with the study of (Bekele, 2006) in the Afar area, who stated that on the eastern side of Afar, *Issas* are the historical enemies of the Afars. Countless bloody conflicts have occurred between Afar and *Issa* since long ago that was attributed range land resource competition. Similarly, conflicts that exist between Afar and the surrounding ethnic groups, the major cause of the conflict between Afar and Karrayou are shortage of pasture and extensive livestock raids (Bekele, 2006).

This study also revealed that in any conflict, an Afdem pastoralist has main option for settlement: recourse to the indigenous *Issa* tribe institutions of conflict management and rear causes resort to the modern system of government interference. Furthermore, the sampled households revealed that the most conflict resolved through community elders and Government interference accounted and the others still not resolved respectively. There is an indigenous *Issa* institution(*xer issa)* promoting local mediation in conflict resolution, which is believed as court, twelve representative elders are selected from the community and set the rules and regulation on the bases of their norms and culture and also set the punishment rules. For example, a tooth of the *Issa* pastoralist has three lactating camels value, which

means a person losing a tooth through conflict can get three camels as compensation from the other party. Intra-clan conflict usually lasts for a short period of time and is often solved through traditional social organization.

4.10. Value of plant species in afdem district

Table 9: plant species in afdem district

Plant Species	Local name	Purpose/uses
Acacia mellifera	Bilcin	For shelter
Acacia nubica	Gumer	For feed
Acacia Senegal	*Cadaad*	For feed
Acacia tortilis	Qudac	For feed and shelter
Acalypha fruiticosa	*Digir*	For feed
Balanites aegyptica	Oude	For feed
Dobera glabra	*Gresee*	For feed
Grewia bicolor	Demeruri	For feed
Grewia tenax	Casheado	For feed and medicine
Grewia Villosa	Gomesh	For feed
Salvadora persica	*C*adey	For feed and clean teeth
Tamarix aphylla	Duur	For feed and shelter
Ziziphus mucronata	*Gob*	For feed, medicine and shelter

In the study Area, plants species are used for different issues, the main being as a source of stock feed for browsers during the dry period and build shelters. So that the plant species found in the district, the fruits of *Grewia bicolor, Grewia Illosa, Grewia tenax, Ziziphus mucronata,* the *Acacia senegal* and *Salvadora persica , Acalypha fruiticosa* as well as *Acacia nubica* were recorded as the most necessary woody plants species, which provide fruit and seed during little rain and long period. Furthermore, *Acacia mellifera, G. tenax* and *Z. mucronata,* were detailed for their use as medicinal plants against Trypanosomiasis and headache respectively, for animals and people. So this findings was in line the studies by(fikirte, 2008) who indicated that woody plants species are used for different purposes, the primary being as a source of livestock feed for browsers during the dry period and medicinal value.

4.11. Expansion of unwanted plant species

Table 10: Reasons for invasion by unwanted plant species

Reasons	frequency	percent
Drought	17	34%
Over grazing	11	22%
Flood	14	28%
Animal dung	8	16%
Total	50	100%

Source: field survey

Encroachment of unwanted plant species has been considered a menace to the deterioration and decline of the pastoral rangeland. in Afdem district, invasion of unwanted plants particularly woody species are found commonly. Major invasive species in the rangelands include *Prosopis juliflora L, Solanum incanum and Cadaba farinose.* The pastoralists in Afdem district perceived that woody plants invasion has been among their major problems. In the study area, the households indicated that the major causes of invasion of woody species to be drought, flood, overgrazing and animal dung. As perceived by the communities, the present finding was in agreement with the reports of previous studies in the different pastoral areas of Ethiopia (Ahmed, 2003; Belaynesh, 2006; Teshome, 2006). The greatest impact of invasive woody species was the shortage of herbaceous layer (canopy effect), bloating due to their seed , reduction in the size of the grazing land and closing of the road by their branch especially *Prosopis juliflora.* Because of its thicket formation, it has hindered the easy movement of people and livestock (FARM-Africa, 2006).

4.12. Limit measures for unwanted plant species

Table 11: Limit measures for unwanted plant species

Pastoralists' effort	frequency	percent
Cutting	15	30%
Burning	6	12%
Uproot the plant	12	24%
Nothing is done	17	34%
Total	50	100%

Source: survey data

The study found out that in most of the sites, traditional invasive plant species protective limits have been practiced litt. Most of the respondents replied that the few measures practiced to minimize unwanted plant species and also cutting and uproot the plant before it reach seedlings stage were the major Limit measures which made in the study district. This findings was contrary the study of (Gemedo, 2004) that Use of fire, extensive grazing and mobility were some of the adaptive strategies of the Booran pastoralists. And the reason is that the area were communal grazing land and difficult to use fire. In the study district, the respondents stated that the combination effect of both invasive plan species and cross mobility of animals had negative impacts on rangeland resource and leading to ecological destruction. This finding was relate the ones was reported by (Fikirte, 2008) who again indicated that that the cumulative effect of both invasive woody species and cross border livestock migration (migrant livestock's from neighboring districts in to the limited rangeland) had negative implications on rangeland ecology leading to sever rangeland degradation.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion and Recommendation

The main source of income in the study district was from the sale of live animal (mainly small ruminants) and their products (mainly milk). Pastoralism was the dominant production systems in the study area and the natural grazing land is the major and only source of livestock feed. There is no privately owned land in the study district, enclosing the land for private purpose is strictly forbidden. Due to their cultural believe, property of land belongs only to God. Even if, the result of the vegetation cover in the grazing areas showed that their grazing lands were destructed, most of the respondents preferred communal ownership of the grazing land for the period of time that is to come. In the study area, the community practices major indigenous methods for the management of rangeland which are seasonal migration, herd splitting to avoid intensive grazing pressure, range land classification on the species base (Hilly areas which are used for goat and camel herding) and soft grazing on deteriorated rangeland through grazing for a short period are the major management practice of rangeland resource. Their traditional herd management practices included mainly allocation of livestock according to distance from water points, vegetation types and based on the land form, i.e. camels and goats are allocated more on the mountainous parts of the district. Apart from such herd splitting practice, the Afdem herders made periodic assessment of the rangelands resource as part of the traditional resource management practice, the movement is guided by a team or an individual of range scouts *(Sehan)* who monitor the state of a rangeland before allowing herds to use it. The pastoralists listed drought, over grazing, and flood as the main reasons for the decline in rangeland resource. Furthermore, the practices pursued to cope with drought by Afdem herders included: migration, herd splitting and selling of livestock. Most of the households replied that

there was a conflict with Somali, Afar and Oromo ethnic groups regarding rangeland resource utilization and that the most conflict resolved through community elders and Government interference accounted and the others still not resolved.

From the findings of this study, it can be clearly concluded that recent increases in livestock populations and frequent droughts have damaged physically the effectiveness of traditional management to minimize risks of livestock losses during drought. The go down in rangeland resource has affected the livelihood of the pastoralists and has made them very susceptible to every climatic threat. As a result, increasing practices of drought coping mechanisms and responses to disaster using both indigenous and modern methods must be given due attention.

The present findings revealed also that the present rangeland resource has become worse and highly influenced by the frequent droughts, overgrazing, and flood. To sustain the pastoral production system in the district, the present rangeland resource of communal rangeland should be reversed through rehabilitation of the grazing land by enhancing the existing vegetation through area closure or resting highly degraded areas to allow regeneration of vegetation; conservation of the rangeland resources through technical and technological supports like, developing water points such as pond's and cisterns as deemed necessary, and water harvesting activities to improve ground water discharge, to enhance the rangeland species composition, selective thinning of invasive woody plants especially *Prosopis juliflora*. Moreover, increasing of the pastoralists indigenous knowledge through giving attention and recognition, as well as organizing awareness creation programmes on proper rangeland management and improvement measures (e.g., proper grazing management, resting of grazing lands) appropriate to the area must be undertaken. In the district, expansion of rain fed crop production might be with high of risks, because of the uncertain and not able to be trusted the nature of the rain as well as the nature of the community. Therefore, emphasis should be given on improving rangeland management practice and looking for additional livelihood options based on their knowledge and available resources. Furthermore, the existing infrastructures, facilities and services indicated that, more than any other pastoral groups in Sitti zone, the Afdem pastoralists have been not receiving enough care in terms of research and development attempts. These low of infrastructures and facilities have been the main obstacles in the district. In order to revert the obstacles and to use well the potential livestock resources, further efforts would be expected and should be done by government and concerned bodies through due attention to the development and improvement of infrastructures and facilities such as road, health services, market, education that link the pastoralists to external society and create their awareness to efficient management practice of the rangeland resources around their environment.

As a scope for future research work in the study district, the following points can be considered:

- ✓ All stakeholders must be involved in the planning and execution of management strategies with full participation of pastoralists and government and non-governmental organizations.
- ✓ The degree of invasion of *Prosopis juliflora L* and its relation to the rangeland degradation should be given due attention.
- ✓ Integrating indigenous and scientific knowledge to adapt rangeland degradation and to manage range land resources should be given due attention.
- ✓ Rangeland resource trend, chemical composition of the key feed resources and soil characteristics should be studied, so that actual carrying capacity of the rangeland can be assessed with certainty.
- ✓ Since drought (extended dry periods) has such an impact on pastoral production systems, minimizing its effects will have significance direct impact on the livelihood of afdem pastoralist.

6. REFERENCE

Abate, Ebro and Nigatu 2010. Traditional rangeland resource utilization practices and pastoralists' perceptions on land degradation in south-east Ethiopia. *Tropical Grasslands* Volume 44, 202-2

Abdurahman Ame, 2004. Techno-Institutional Regimes and Rangeland Management in Ethiopia. pp 4-8. Proceedings of the 10th Biennial Conference on the Role of Information Technologies in Devising Sustainable Strategies. Oaxaca, Mexico.

Abule Ebro, 2003. Rangeland evaluation in relation to pastoralists perceptions in the middle Awash valley of Ethiopia. A PhD Thesis Presented to the University of the Free State, Bloemfontein, South Africa. 297p. Abule Ebro, H.A. Snyman, and G.N. Smit, 2005.

Admasu Terefe, 2006. Pastoralists Perceptions on Range-Livestock Management Practices and Rangeland Assessment in Hamer and Benna-Tsemay Districts of South Omo Zone. An MSc Thesis Presented to the School of Graduate Studies of Alemaya University, Ethiopia.

Ahmed Bashir, 2003. Soil condition and vegetation cover in human impacted rangelands of Jijiga, Somali Regional State. An MSc. Thesis Presented to the School of Graduate Studies of Alemaya University, Ethiopia. 108p.

Ahmed Beshir, Lisanework Nigatu, R.M. Baars and Ahmed Sheik, 2005. Livestock rearing, rangeland management and change in the vegetation cover in Jijiga zone rangelands of Somali Regional State, Ethiopia. pp. 55- 65. Proceedings of the 12th annual Conference of ESAP (Ethiopian Society of Animal Production) held in Addis Ababa, Ethiopia, August 12-14, 2004.

Alemayehu Mengistu, 2005. The quantification of range condtion in semi-arid grassland of Southern Africa. *Afr. J. Range and Forage sci.*16 (3): 49-61. Yates, C. J., D. A. Norton and R. J. Hobbs, 2000.

Alemayehu Menigistu, 2004. Rangeland: Biodiversity Concepts, Approaches and the way forward. Addis Ababa University, Faculty of Science, Addis Ababa, Ethiopia, 80p.

Fekadu Beyene, Kassa Belay & Winfried M, 2005. Coping with drought among pastoral and agro pastoral communities in eastern Ethiopia. 196 *Journal of Rural Development 28. PP12.*\

Fikirte Hailue, 2008. Rangeland resource utilization and condition assessment in Afdem district,shinile zone, east Ethiopia. MSc thesis presented to the school of graduate studies of Haramaya University.

IPS (Industrial Project Service), 2002. Resource Potential Assessments and Project Identification Study of Somali Region. Vol.3. Agricultural Resources. Industrial Projects Service. No. 09 (137)-91. Addis Ababa. p401.

Lishan Tsehay, 2007. Assesment Of Rangeland Condition And Community Perception In Pastoral And Agropastoral Areas Of Shinile Zone Of Somali Regional State, Ethiopia. An MSc Thesis Presented to the School of Graduate Studies of Alemaya University.

Mohammed Mussa & Associates (2001). Pastoral Development Programme in Ethiopia. Consultancy report prepared for Oxfam Great Britain.

Oba, G., 1998. Assessment of Indigenous Range Management Knowledge of the Borana Pastoralists of Southern Ethiopia. Borana Lowland Pastoral Development Program/GTZ Consultancy paper. Negelle/Borana, May 1998.

SC (Save the Children), DPPB, and Partners, 2002. An HEA Baseline Study. Save the children at Shinile Administrative zone, Somali National Regional State, Ethiopia.