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Pastoralists' Perceptions towards Rangeland Degradation and Management in Donga-Mantung Division, North West Region, Cameroon

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Abstract**—** *Local land users often have different perceptions on the problems of rangeland degradation, compared to researchers and Government officials. This study was aimed at breaching this gap, by empirically exploring pastoralists' perceptions regarding rangeland degradation in Donga-mantung. The pastoralists' perceptions were studied through a descriptive statistics method. Focus group discussions, field observations and structured/semi-structured survey questionnaires, were used for data collection, where 200 pastoralists were targeted. The study covered seven Ardorates based on intensity of rangeland degradation (high, medium and less). The major findings indicate that, the main livestock production constraints were Insufficient and poor pasture (50.5%), cattle diseases (24.5%), Farmer/grazer conflicts (14.5%) and insufficient cattle drinking points (10.5%). Majority of respondents (59.5 %) confirmed that cattle population is declining in the study area. According to 59.5% of the respondents, the study area present range condition has deteriorated and become poor. The major causes for degradation were overgrazing, bush encroachment, soil erosion and limited care and attention paid to rangelands. The major socio-economic impacts of rangeland degradation were poverty (51.0%), food insecurity (35.5%) and conflicts (11.0%). The pastoralists of the study area traditionally practice rangeland management in different ways such as bush burning, bush clearing and herd mobility. A proportion of them (41.5%) have adopted the planting of improved pasture(s). Government and NGOs' supports proved to be limiting in the study area. Nevertheless, the measures perceived by pastoralists to reduce degradation of their rangeland include; planting of improved pastures (40.5%), clearance of bushes that have encroach on rangelands (28.5%), establishing community awareness and community empowerment on rangeland degradation (17.0%), reducing the number of farmlands (9.5%) and reducing soil erosion (4.5%). This study showed the need for rangeland professionals, researchers, planners and other stakeholders to integrate the communities' perceptions and existing indigenous ecological knowledge to ensure a sustainable rangeland management.*

Keywords**— Degradation, Pastoralism, Perception, Rangeland, Management.**

I. INTRODUCTION

Rangelands are ecosystems in which the indigenous vegetation is predominantly grasses, grass-like plants, forbs or shrubs that are grazed or have a potential to be grazed, and are used as a natural ecosystem for the production of grazing livestock and wildlife (Allen et al, 2011). It is estimated that rangelands make up at least 1/3rd of the earth's land surface and to some, represent the ultimate wilderness – the "last frontier" (Herrera et al, 2014).

Pastoralism is a livelihood which is extensively followed across the world in rangeland ecosystems. It supports 20 Million households and roughly 240 Million individuals, being practiced in 25% of the total surface of the globe and provides 10% of the world's meat production (Nori *et al*., 2008). Dry lands where the largest part of the rangelands are located, make up 43% of Africa's inhabited surface and are home to 268 Million people (40%) of the continent's population (Grain, 2010).

Rangeland degradation is a global concern, affecting not only pastoralists who rely on rangelands for their survival, but others who suffer from resultant hydrological disturbances, dust storms, commodity scarcity and social consequences of uprooted people. Rangeland health also affects biodiversity directly and indirectly because, all native flora and fauna have adapted to the long term evolutionary forces which have shaped those rangeland environments (Harris, 2010). Rangeland degradation has

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been estimated by several authors; for example, Dregne *et al.*, (1991) estimated that 73% of the world's 4.5 Billion hectares of rangeland are moderately or severely degraded. Bruce (2007) also reviewed that 20% of the world's pastures are considered to be degraded through overgrazing, compaction and erosion, where overgrazing accounts for 35% of the land degradation worldwide. One of the major aspects of rangeland degradation is reduction in the capacity of the ecosystem to support livestock production and productivity.

Rangelands cover a surface area of more than 2 million hectares in Cameroon (Blasius, 2009). Despite their relatively unpredictable climate and unproductive nature, they provide a wide variety of goods and services including forage for livestock, habitat for wildlife, water and minerals, woody products, recreational services, nature conservation as well as acting as carbon sinks. Rangelands in Cameroon are predominantly grassland savanna with three distinguishable types: The Guinean savanna, Sudan savanna (also known as 'derived Montagne grasslands'), and the Sahel savanna (ibid.). They are home to the Fulani pastoralists and agro-pastoralists, sedentary farmers, as well as fishermen and hunters who depend on these rangelands for their livelihoods.

These different land users have interacted relatively peacefully over the centuries. However, in recent years this harmony has been threatened by both internal and external influences resulting in conflicts between them. The reasons for these are manifold. At the core of the conflicts however is the declining resource base for pastoralists, occasioned by increasing human population and changing land use pattern in favor of commercial agriculture, conservation and tourism as well as other economic interests such as infrastructure, energy development and mining. These conflicts do not only occur between pastoralists and farmers but also between pastoralists and fishermen, between pastoralists and conservationists and to an extent between pastoralists themselves. A root cause of these conflicts is the lack of attention paid to rangelands, resulting in poor investment and support (Blasius, 2009).

Local land users often have different perceptions on the problems of rangeland degradation, compared to researchers and government officials (Dejene *et al.*, 1997). This has resulted in misunderstanding among experts, in diagnosing and solving the problem. The issue has become a constraint, to the successful implementation of rangeland management programs (Mapinduzi *et al.*, 2003). Experience shows that, policies, programs and strategies aimed at halting degradation, were hardly evaluated from the perspective of the local communities (Schechambo *et al.*, 1999). Although a number of frameworks have been used to identify and elaborate indicators for sustainable rangeland management, those indicators have too frequently been identified, evaluated, and selected by researchers (Reed and Dougill, 2002). Sustainable rangeland management systems should result from a combination of community based indigenous knowledge, communities' perceptions combined with past practical experience and scientific knowledge to rehabilitate degraded rangelands and conserve biodiversity.

This study aims to analyze the perceptions of pastoralists on rangeland degradation and to explore the requisites for effectual responses in order to secure a sustainable rangeland management in Donga-Mantung Division. It focuses on the following five areas: (i) Examine the awareness of pastoralists towards rangeland degradation, (ii) Describe the current range condition, (iii) Identify major root causes of rangeland degradation as perceived by pastoralists, (iv) Analyze the consequences of rangeland degradation on the local communities, (v) Assess pastoralists' conservation measures to reduce rangeland degradation and explore the kinds of support, needed to make these conservation measures more resilient.

II. METHODOLOGY

1.1 The study area

Donga-Mantung is one of the seven divisions of the North West Region of Cameroon. It is a very old Administrative Unit created in 1949, within what was called Bamenda Province. At the time, it was known as Nkambe Division. Donga-Mantung has five (5) Sub-Divisions, namely; Ako, Misaje, Ndu, Nkambe and Nwa. It covers a surface area of about 4340km^2 and falls within an altitude of 250m and 2200m above sea level. It lies between latitudes 5.35° and 6.40° North of the equator, and between longitudes 9.5° and 11.0° east of the Greenwich meridian (Divisional delegation; MINADER-Nkambe central). Topographically, this division is comprised of major relief units separated by escapements. An example is the Mbaw plain with an average altitude of 400m above sea level. The study zone falls within the tropical climate domain, which is sub classified as the mount Cameroon type found in the western highlands. The economy of Donga-Mantung Division is dominated essentially by activities of the primary Sector; agriculture and livestock. The division occupies an enviable second place in livestock production in the country after Mayo-Banyo in the Adamawa. The number of cattle is estimated at over ninety thousand. Generally speaking, livestock production in the Division is said to be on the decline because of rangeland degradation, lack of knowledge of modern grazing methods, limited Government support, persistent conflicts with the local farming populations, rampant cattle rustling, theft and epidemics (SDO's office; Nkambe central). Estimates from

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the 2010 general population and housing census, place the total population of the division at about 2,69,931 inhabitants spread over a surface area of approximately 4340km^2, giving a density of 62 persons/ km^2.

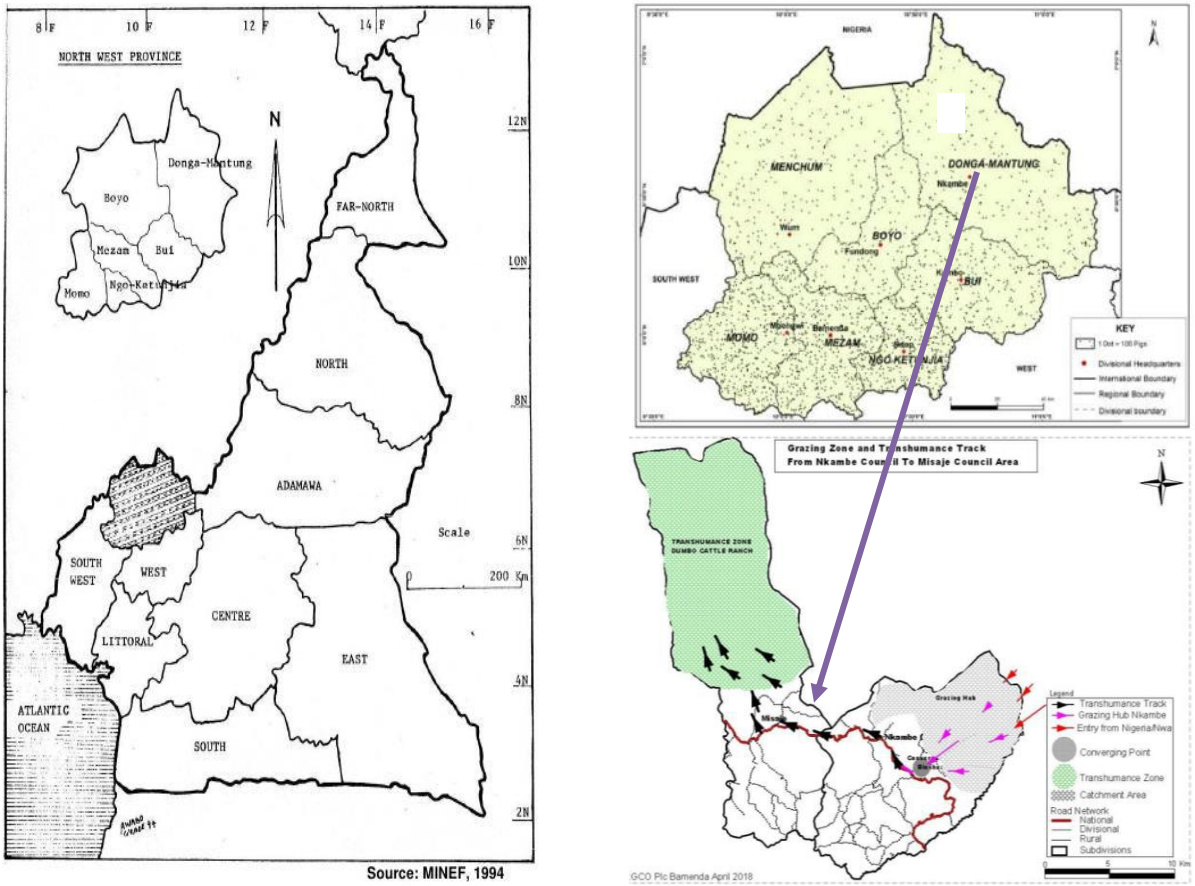

Fig.1: Location of Donga-Mantung and the study area in Cameroon and the North West region

2.1. Sampling procedure and data collection

Both probability and Non-probability sampling methods were employed in this study. Firstly, a Judgement or Purposive (Non-probability) sampling method was used to select the sub-divisions covered. This was based on livestock productivity and rangeland conditions. The two sub divisions selected (Nkambe and Misaje) are the highest livestock producing points in the division with vast hectares of rangeland. The second stage of selection constituted a probability sampling method. Here, Stratified sampling was used to determine the sample size of the target population. The population of pastoralists in the target sub divisions are distributed in 13 major ardorates. 7 of these ardorates were selected based on the intensity of degradation. Three highly degraded (Dumbo, Sabongida, Akweto), two medium degraded (Konchep, Binjeng) and two less degraded (Nkambe and Binka) ardorates were therefore selected on this note. A sample size of 200 pastoralists was targeted in these ardorates giving a percentage validity of 35.15%.

Table 1: Sample size distribution in the study area.

Name of Ardorate	Total number of pastoralists	Sample size	Percentage(%)
Binka	114	35	17.50
Akweto	108	30	15.00
Dumbu	107	30	15.00
Sabongida	103	30	15.00
Nkambe	65	25	12.50
Binjeng	38	25	12.50
Konchep	34	25	12.50
TOTAL	**569**	**200**	**100**

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2.2. Statistical analysis

Data collected were analysed with the help statistical package for social sciences (SPSS) version 14.0. The descriptive statistics was used for the analysis because the study is concerned with the assessment of perceptions on a phenomenon (Rangeland degradation) at present. The descriptive statistics made use of frequency distribution, and percentages. To facilitate interpretation, results were illustrated through the use of tables, pie charts, bar charts and sometimes demonstrative photos from field observations.

III. RESULTS AND DISCUSSION

3.1. The socio-economic characteristics of pastoralist households:

The age group of 40 – 59 years is the highest represented (42.0%) in pastoral activities in the study area. The proportion of youths within an age limit of 20 – 39 years, which stands at 30.5%, is also noticeable. Although 100% of the pastoralists were men folks, women and children also had few livestock amongst the flocks. The average household size among pastoralists in the study area is 1 – 10 persons (40.5%). A great majority (90.0%) of respondents were married with a minimal record of divorce cases (0.50%) and no deceased case. Results also reveal that, there is high level of illiteracy amongst the respondents. Furthermore, a large majority (83.0%) of respondents earn their living from both cattle rearing and crop cultivation. The following table summarizes the socio-economic characteristics of respondents.

Table 2: Distribution of Respondents by Socio-economic characteristics

Variable	Frequency	Percentage
Sex of Respondent		
• Male	200	100.0
• Female	0	0.0
Age of Respondent		
• 0 – 19	4	2.0
• 20 – 39	61	30.5
• 40 – 59	84	42.0
• 60 and Above	51	25.5
Household size		
• 1 – 10	81	40.5
• 11 – 20	75	37.5
• 21 – 30	26	13.0
• 31 – 40	12	6.0
• More than 40	6	3.0
Marital status		
• Married	180	90.0
• Single	19	9.5
• Divorced	1	0.5
• Widow/Widower	0	0.0
Level of Education		
• Non lettered	135	67.5
• Primary education	39	19.5
• Secondary education	20	10.0
• Higher education	6	3.0

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Main livelihood activity		
• Cattle rearing only	31	25.5
• Cattle rearing and crop cultivation	166	83.0
• Cattle rearing and trading	3	1.5

Statistics from Table 2 clearly shows that, youths are moderately implicated in pastoral activities in the study area. This could be due to the fact that; agriculture is the main livelihood activity of the population in Donga-Mantung because of very limited industries. According to Shidiki *et al.*, 2018, the majority of pastoralists are men folk even though women and children have few livestock amongst the flocks. Furthermore, majority of pastoralists in Cameroon are Fulanis thus there is high polygamy and dependency rates further corresponding with literature from Encyclopedia of world cultures (2018). The results also reveal that, there is high level of illiteracy amongst the respondents. This is similar to the results of (Kelly *et al.*, 2016) regarding low level of education amongst the pastoralists in the North West region in general. Pastoralists in the study zone are living more of a sedentary lifestyle. They are now highly involved in peasant activities as said by Nji, (1995). This is realistic because of the positive interaction that exists between animal husbandry and crop farming (Turner, 1995).

3.2. Pastoralists awareness and concern for rangeland degradation in the study area

Respondents were asked whether they observe negative changes in the condition of their rangelands from the previous years. A large majority (88.0%) of them responded in the affirmative. Further proofs show that the respondents were not only aware of these negative changes, but also had knowledge of the degree of evolution. Figure 8 illustrates this, in response to how these changes have evolved for the past 10 years.

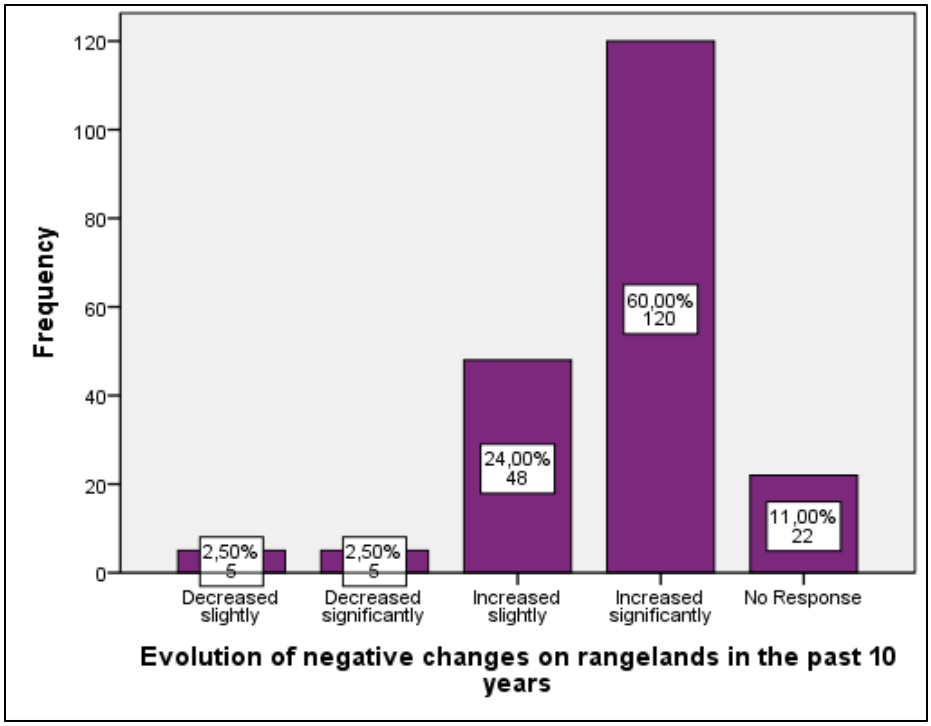

Fig.2: Evolution of negative changes on rangeland in the past 10 years

From Figure 8, over 60.0% of respondents said, these negative changes observed on their rangelands have increased significantly over the last 10 years.

Again, similar to the results of Herrera *et al.*, (2008), members of focus group discussion said, biodiversity depletion can be visible within the study area interpreted through changes in vegetation cover, wildlife scarcity, scarcity of veld products, extinction of certain medicinal trees and plant species, scarcity of high quality thatching grass and scarcity of quality fuel wood. They have noticed that their rangelands are increasingly being deprived from these essential resources that they used to benefit from in

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the past. This does not only show how aware the pastoralists are about degradation of their rangelands but proofs very sufficiently that, they are capable of interpreting changes they see on their rangelands and environment as a whole.

3.3. Current range condition in the study zone

Majority of the respondents (59.5%), explained with dissatisfaction that their range condition is poor and becoming more unproductive for cattle production. This is illustrated in Figure 11.

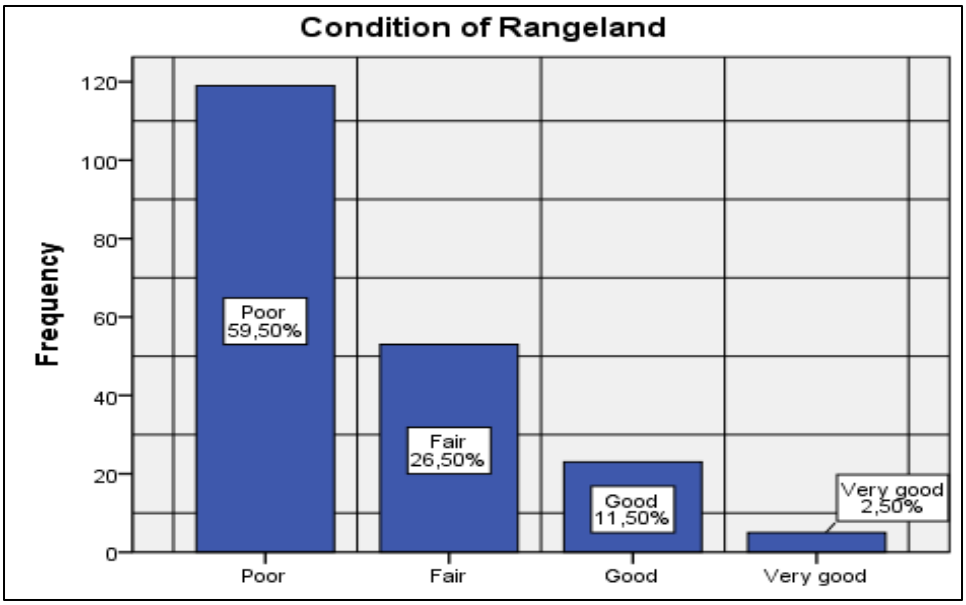

Fig.3: Percentage distribution of respondents on the range condition

These statistics ties with that from the Divisional Delegation of MINEPIA for Donga-mantung where, over ¾ of the grazing surface area in Donga-mantung (3,209.25Km²) have been affected either with bush cover or other unwanted species for bovine (MINEPIA Divisional Delegation Report, Nkambe; 2016). This is also similar with statistics from World Bank (1992) who proved that: Very few countries have less than 50 percent of their pastoral lands degraded. Photos from Field observation further paint a picture of the current condition of rangeland in study area.

Image 1: Bush encroachment in the study area (Source: Adamu, 2018)

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Image 2: Noxious species in the study area; Bracken fern and the bokassa grass respectively (Source: Adamu, 2018)

Image 3: Condition of rangeland in the study area; soil erosion and overgrazing respectively. (Source: Adamu, 2018)

3.4. Causes of rangeland degradation in the study area as perceived by pastoralists

According to respondents, the various factors that cause and provoke degradation are; overgrazing, bush encroachment, soil erosion and limited care and attention paid to rangelands. Table 11 below illustrates this.

Table 3: Distribution of pastoralists on the causes of rangeland degradation

Cause of rangeland degradation	Frequency	Percentage (%)	Rank
Overgrazing	84	42.0	First
Bush encroachment	65	32.5	Second
Soil erosion	22	11.0	Third
Limited care and attention for rangelands	16	8.0	Fourth
Total	**187**	**93.5**	
No response	11	5.5	
Difficult to understand response	2	1.0	
TOTAL	**200**	**100.0**	

According to the majority of the respondents (42.0%) and focus group participants, overgrazing is the main factor that causes rangeland degradation. This corresponds with the statistics of Barrow (1991) regarding the fact that

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overgrazing by livestock is the principal land problem. Small ruminants like sheep, goats, donkeys and other large ruminants like horses owned by pastoralists also contribute to this phenomenon as said by respondents. According to discussions with focus group participants, overgrazing is mostly caused by overstocking (putting more animals in an area, than it is capable of supporting) thus corresponding with the literature of Herrera *et al*., (2008). When overgrazing occurs, there is limited pasture available for the cattle and thus creating an insufficiency in their nutritional needs hence in the same light with results of IFAD (2003).

According to field statistics, a large majority of respondents (77.5%) said they are faced with the problem of bush encroachment on their rangelands. Bush encroachment is considered to be one of the most extensive forms of rangeland degradation in the study area, hence not different from what Schroter *et al*., (2010) said concerning bush encroachment in arid and semi-arid regions of the Earth. Encroachments by unwanted plant species such as the Bokassa grass (*Chromolaena odorata*) is a big threat for the pastoral communities in the study area. Similar to this are the findings of Blasius (2009) regarding Bokassa encroachments in the country as a whole. *Chromolaena odorata* has been reported to be the most problematic invasive species within protected rainforests in Africa (Wikipedia encyclopedia, 2018). It contains carcinogenic pyrrolizidine alkaloids which are toxic to cattle. It can also cause allergic reactions (ibid.). According to participants of focus group, the causes of bush encroachment include but are not limited to: overgrazing, soil erosion, wind effect and dung from cattle thus similar with the findings of (Kgosikoma, 2013).

Soil erosion is another cause of rangeland degradation. Gully erosion is an advanced stage of rill erosion, while the latter is an advanced stage of the sheet erosion. These types of erosion are common in the study area. In most of the places, the gullies are at their initial stage and in other areas; they are at developing stage due to high runoffs down the hill slopes. As shown in image 5A, erosion sometimes give rise to bare ground spots in the grazing fields thus hindering good pasture development.

There is limited care and attention paid rangelands in the study area. Limited bush clearing and absence of controlled bush fires are one of the most under looked aspects of their rangelands the Focus group members iterated. According to literature, there are very few rangeland experts at present in the country (Blasius, 2009). This makes it difficult for proper community sensitization on rangeland management.

3.5. Consequences of rangeland degradation on the local communities

3.5.1. Average herd size and major cattle production constraint in the study area

Statistics from Table 12 shows that, majority of pastoralists in the study area own between 1 and 2 herds (proportion of 23.5% and 34.0% respectively). Most of them said, their individual grazing area is not favorable to support more than 5 herds, reason why they rotate averagely between 1 and 2 herds while aiming for an increase.

Table 4: Distribution of respondents according to major cattle constraints

Herd size of pastoralists	Frequency	Percentage (%)
1 Herd	47	23.5
2 Herds	68	34.0
3 Herds	29	14.2
4 Herds	24	12.0
5 Herds and above	32	16.0
Total	**200**	**100.0**

According to participants of Focus group, pastoralists in the study area had many herds of cattle in the past years compared to the present. This is similar to the work of Ngalim, (2015) in relation to cattle population decline in the North West region in general. The main factors contributing to this decline they say are; deteriorating condition of their rangelands, poor and insufficient pasture, prevalence of diseases, conflicts with other rangeland users and sometimes harsh climatic conditions.

Again according to field results, one of the major cattle production constraints faced by the pastoralists is that of insufficient and poor pasture which accounts for over 50.5% of responses. The pasture insufficiency is as a result of rangeland degradation. When these bushes encroach on rangelands, it leads to poor quality pasture available for cattle. The most common feeds available for cattle in the area of study include; Improved pastures: *Brachiaria spp*, *Trypsacum laxum* (Guatemala grass), *Pennisetum purpureum* (Elephant grass) and *Stylosanthes guianensis*. Local or natural pastures: *Hyparrhenia rufa*(roofing grass), *Imperata cylindrica*(spear grass), *Cyndron spp*, Star Bermuda, *Corchorus olitorius*(Jute plant), *Desmodium*

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intortum, Jatropha curcas, Acacia spp, Cajanus cajan and African iodine.

3.5.2. Consequences on the mobility pattern of cattle

According to field statistics, over 67.0% of respondents practice seasonal herd mobility (Transhumance). Table 14 shows the different reasons that pushed pastoralists in the study area to practice herd mobility during the dry season.

Table 5: Distribution of respondents according to the major reasons for transhumance

Major reason for transhumance	Frequency	Percentage (%)
Search for water and pasture	115	57.5
Security reasons	14	7.0
Prestige	5	2.5
Do not practice herd mobility	66	33.0
Total	**200**	**100.0**

Majority of respondents (57.5%) practice transhumance mainly in search for water and pasture, as they do not have sufficient pasture in their area to cover the dry season period. Again the main cause of this is due to the degradation of their rangelands. It is usually a cumbersome trip that leaves at times, negative impacts on both the pastoralists and their cattle as the respondents said. It is sometimes counterproductive since they find themselves in a win-lose situation. Related to this is the usual farmer/grazer conflicts they come across due to settlement of farmers along transhumance corridors. Sometimes these corridors are not well equipped with drinking points and other logistics to cater for the pastoralists and their animals. The long distances covered by cattle during this period affect their body weights drastically. Some end up dying on the way (especially the calves), while others finally reach with much fatigue and takes time to regain momentum, thus leaving the pastoralists with much losses (SODEPA Dumbo Cattle Ranch Record, 2016).

3.5.3. Socio-economic effects on the local population

Another negative consequence of rangeland degradation on the local communities is the socio-economic effects it leaves on the population. According to respondents, poverty, food insecurity and conflicts are the main socio-economic impacts of rangeland degradation on the population, as shown in the Figure 12.

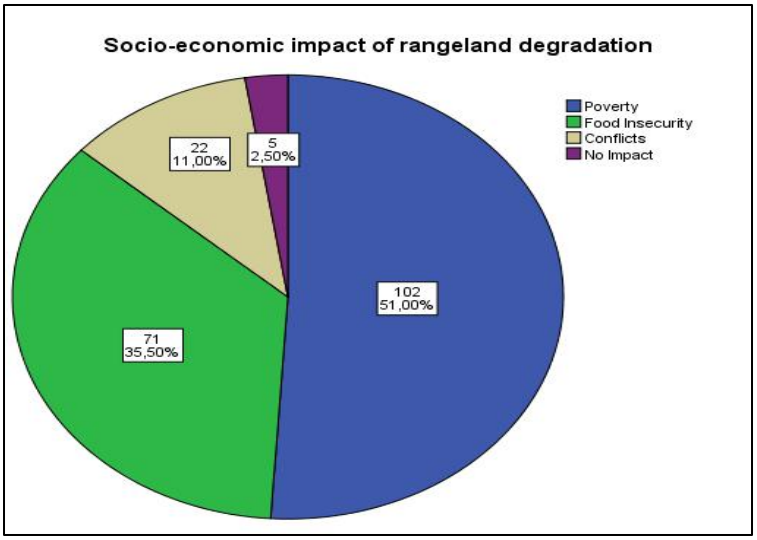

Fig.4: Distribution of respondents according socio-economic impact of rangeland degradation

As can be seen from Figure 12, over 51.0% of respondents said poverty is the main negative effect of rangeland degradation. This is similar with the findings of Herrera et al., (2008). Blasius, (2009) also have similar results in relation to problems faced by pastoralists in the Far North Region of the country.

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3.6. Rangeland management in the study area

Despite the degradation of their rangelands, pastoralists in the study area have devised several means to secure the rangelands from degradation. However, most of these measures are to reduce the rate of degradation as it cannot be completely stopped.

a. The use of Bush fires in rangeland management

One of the ways pastoralists of this area reduce rangeland degradation is by practicing controlled bush burning through the use of bush fires; usually during the dry season. Here, one part of the grazing field is set on fire while cattle graze on the other part and when the former starts to produce pasture, the latter is then also set on fire.

Table 6 gives statistics of the number of pastoralists that practice bush burning and their perception on bush fires.

Table 6: Fire usage and pastoralists perceptions on bush fires in the study area

		Do you believe the practice of bush burning is good for rangeland management?		
		Yes	No	*Total*
Do you use fire for the management of your rangeland?	**YES**	152 (76.0%)	35 (17.5%)	187 (93.5%)
	NO	4 (2.0%)	9 (4.5%)	13 (6.5%)
TOTAL		156 (78.0%)	44 (22.0%)	**200 (100.0%)**

From the frequency table above, over 76.0% of respondents, use fire in the management of their rangelands and believe bush fire is good for rangeland management. This is similar with the writings of Richard Forsman in his concept notes for rangeland management who said "Fire is an important regulator of range vegetation, whether set by humans or resulting from natural igniters (lightning)''. Fires tend to reduce the abundance of woody plants and promote herbaceous plants including grasses, forbs, and grass-like plants (ibid.).

b. Bush clearing

Another conservation measure pastoralist's use to reduce rangeland degradation is clearing of bushes that have encroached on their rangelands.

They simply reduce bushes without necessarily burning. According to members of focus group discussion, the pastoralists at an individual level reduce bushes, shrubs, trees and other unfriendly species of pasture from their grazing area.

c. Seasonal herd mobility or transhumance

Furthermore, despite the negative effects of herd mobility on both the pastoralists and their herds, pastoralists still resort to this short term management strategy as a means of securing their rangelands. Mobility allows the pastoralists to respond quickly to fluctuations in resource availability thereby maintaining their herds and other assets as well as their productivity. It allows tracking changes in the dramatic fluctuations in feed supply, avoiding areas where forage is insufficient and mopping up surpluses where they are abundant (Behnke, 1994).

d. Adoption of improved pastures

Moreover, pastoralists in the study area do not only limit themselves to bush burning or clearing in order to reduce rangeland degradation. Some of them also practice pasture improvement to complement the available natural pasture. Over 41.5% of respondents practices pasture improvement on their rangelands. Table 16 paints a picture of the types of improved pastures grown in the study area.

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Table 7: Distribution of respondents according to types of pastures cultivated

Type(s) of pasture(s) cultivated	Frequency	Percentage (%)
Guatemala and Brachiaria.	32	16.0
Guatemala only.	20	10.0
Brachiaria only.	31	15.5
Do not practice pasture improvement	117	58.5
Total	**200**	**100.0**

3.7. Pastoralists' perceptions on the solutions of rangeland degradation in the area of study

The following diagram gives statistics of solutions of rangeland degradation perceived by respondents.

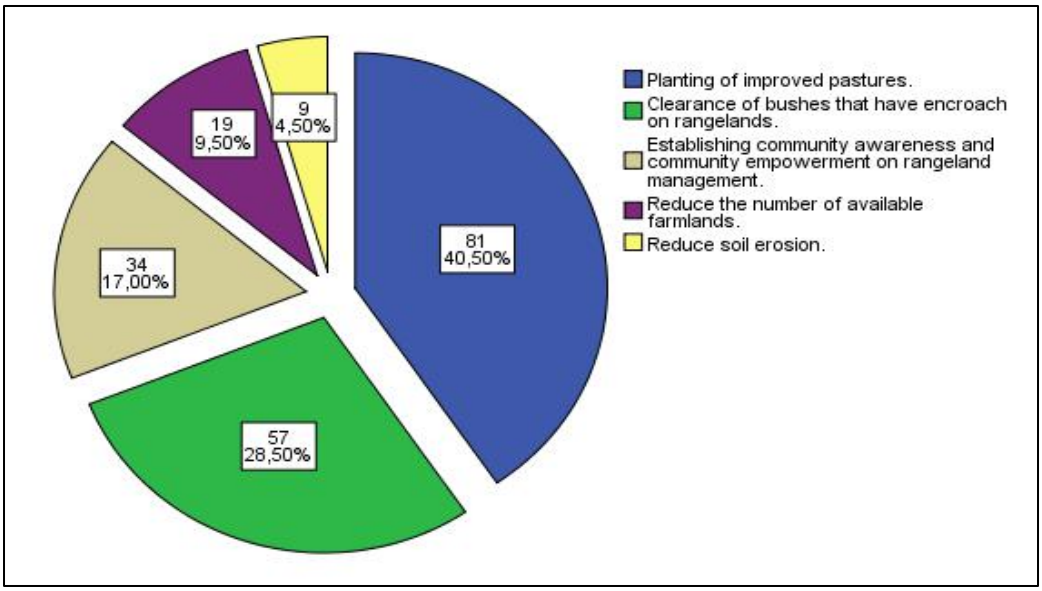

Fig.5: A distribution of respondents according to proposed solutions towards rangeland degradation

Statistics from Figure 13 shows that 40.5% of respondents said, the most workable solution for rangeland degradation is the planting of improved pasture. However, other respondents (28.5%) said, the clearance of bushes that have encroached on their rangeland is the most suitable solution to reduce rangeland degradation in the area. Again, others (17.0%) saw establishing community awareness and community empowerment to manage rangelands as a good solution for their area. Furthermore, 9.5% of respondents reiterated the issue of farmer/grazer conflicts. They said these conflicts mostly arise because of too many farmlands confining the areas under grazing. They therefore recommended the reduction of farmlands in the area. Moreover, some respondents (4.5%) were conscious of the problem of soil erosion in their rangelands. They recommended that soil erosion should be looked at.

IV. CONCLUSION

Rangeland degradation in Cameroon is recognized as a severe and on-going problem. Such a multi-dimensional concept involves value judgments by different stakeholders, more importantly by the pastoralists who are the main users and hold the biggest stake in rangelands. This study was conducted to determine the pastoralists' perceptions toward rangeland degradation and management in Donga-mantung of the North West region of the country. The study demonstrates very sufficiently that, pastoralists are aware and well acquainted with the degrading condition of their rangelands. They confirmed negative changes on their rangelands and highlighted that, these changes have increased very significantly over the last decade. Therefore, the condition of rangeland in the study area proved to be poor. The main causes of this degradation are; overgrazing, bush encroachment, soil erosion and limited care and attention paid to rangelands. Furthermore, rangeland degradation has several negative consequences on the local population. It has impact on the average herd sizes owned by pastoralists and also on herd mobility. Poverty, food insecurity and conflicts amongst others, proved to be the main socio-economic effects of rangeland degradation. Nevertheless, pastoralists in the study area had coping strategies to manage and conserve their rangelands, despite their limited resources and limited external support. They practice bush burning, of which

most of them believed is good for rangeland management. Bush clearing is another resort despite its limited scale in the study area. In addition to this, they practice the planting of improved pastures like Guatemala and brachiaria grasses to help substitute the natural pasture especially in times of scarcity like the dry season. Government and NGOs' support, proved to be very limiting in the study area. However, the main government and NGO supporting platforms are LIFIDEP/ACEFA and MBOSCUDA respectively. Notwithstanding, pastoralists proposed several measures they thought, should be done by stakeholders to improve the condition of their rangelands. They include but are not limited to; vulgarization of improved pastures, bush clearing, creating community awareness and empowerment on rangeland management, reducing farmlands under cultivation and reducing soil erosion. If these are taken into consideration, the problem of rangeland degradation in the study area could be reduced.

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