OROMIA IRRIGATION AND PASTORALIST DEVELOPMENT BUREAU

OROMIA LOWLANDS LIVELIHOOD RESILIENCE PROJECT (OLLRP)

THE ROLE OF INDIGENOUS KNOWLEDGE ON RANGELAND MANAGEMENT: THE CASE OF MALBE GRAZING UNIT ('DHEEDA MALBEE')

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List of Acronyms

CSA ..... Central Statistics Agency

SNNPR.....South Nations Nationality and Peoples Region

RCST..... .....Rangeland Cluster support Team

IK.....Indigenous Knowledge

IEK..... .....Indigenous Environmental Knowledge

FGD.....Focus group discussion

LLRP.....Lowlands Livelihood resilience project

NRM.....Natural resource management

NGO.....Non-government Organizations

RCST.....Rangeland cluster support team

1. Introduction

Pastoral communities usually have a detailed knowledge of their grazing lands, acquired through extensive observation and continuous herding practice (Oba and Kotile 2001; Mapinduzi et al. 2003). Despite the existence of such knowledge, researchers and development policy experts have previously overlooked community based knowledge when evaluating rangelands. Turner et al. (2000) concluded that traditional knowledge of indigenous people was fundamentally important in the management of local resources. Other studies (e.g. Fernandez-Gimenez 2000; Ayana and Fekadu 2003; Amaha 2006; Ayana and Oba 2008) also showed that documenting indigenous knowledge of rangeland resources can provide useful information for the development, sustainable utilization and conservation of natural resources. Additionally, community-based knowledge may provide new insights for improving existing scientific knowledge and a basis for designing appropriate research and development policies. In most parts of Ethiopia, the indigenous knowledge of pastoralists is not adequately documented (Gemedo 2004; Amaha2006).

The Borana people live about 570 km south of Addis Ababa in Borana Zone of the Oromiya Regional State. They have two moieties known as Sabbo and Gona. They speak a dialect of Afaan Oromoo. They are predominantly cattle herders. Agriculture is not highly practiced because of the little rainfall. Still, they plant sorghum and maize to some extent. They are well known by their still functioning Gada system. These people have a very rich and unexplored culture. Among others, their marriage system is a very interesting one.

Although indigenous knowledge can fill crucial gaps in our ecological understanding, but indigenous people often ignore that their knowledge is being used by scientists. They often lose control over the information they share, and have no power over how that knowledge is interpreted and used. Indigenous knowledge symbolizes our identity and perpetuates our cultural heritage. Thus, it should be identified, recorded, explained and preserved for use by generations.

Borana pastoralists have high potential of rangeland with well-structured customary system of range management. They use their indigenous knowledge to categorize landscapes not only in terms of seasons of use, but also in terms of grazing capacity. Indigenous knowledge (IK) is the dynamic and complex body of know-how, practices, and skills developed and sustained by peoples and communities with shared histories and experiences. It is community-based, culture-specific, and location-specific. It is impressive in content and practical in application, and critical to successful livelihood strategies.

Geographically, the entire Borana lands were divided into five *dheedaas* namely Gomole, Golbo, Dire, Malbe and Mata-wayama rangeland units. Out of these five, Dheda Malbe rangeland unit encompassed Elwaye Anna (all

Gandaas), Yabelo (2 gandaas), Taltele(all Gandas) and Dillo(1 Ganda) districts of Borana zone administration; and all rangeland units have one *jaarsaa dheedaa* in their respective rangeland units. Dheeda is the large cluster of rangeland unit's area for which talented jaarsaa dheeda is designated to manage. Jaarsaa dheeda is a customary elder that administers the overall rangeland unit. His delegation will be for *Abba Gadaa*.

Dheeda malbee (Malbee grazing unit) is one among five grazing units of Borana. This indigenous knowledge is directly emanated from communities living around Malbee grazing unit of Borana pastoralists. The traditional knowledge may play an important role in LLRP intervention areas specially the rangeland management and pasture improvement, conflict management and secure access to key resources of and participatory rangeland management planning.

Traditional knowledge for rangeland management, water resource usage, prediction of rainfall (duration, amount and onset/offset) and land tenure system have supported pastoralists in Malbe grazing units to cope with climate variability and adapt to climate change, and improves management of climate-related risks in agriculture. Availability of reliable climate information services and effective and efficient forecast information dissemination systems are crucially supported decision-making processes across a grazing unit. Forecast information is disseminated directly from IK experts or indirectly through clan or village meetings, relatives, and friends. However, Pastoralists have adapted to the uncertainty of the natural environment; flexibility (being mobile) and temporal flexibility (having variable herd sizes and risk management strategies) through their traditional institutions. These institutions govern mobility, resource use and redistribution, and have enabled pastoralist societies to withstand extreme pressures of both their environment and their competitors. Moreover, traditional leadership, beliefs, customs, taboos and folk tales are used as traditional mechanism for scaring people from loss of common property

Nowadays this immense knowledge has faced problems due to the intrusion of foreign technologies, interference of local government by applying development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. There is a grave risk that much indigenous knowledge is being lost and, along with it, valuable knowledge about ways of living sustainably both ecologically and socially. As indigenous knowledge are basis for rangeland management strategies, it should be applied in intervention areas, recorded in written form and readily accessible to agricultural researchers, development practitioners, and policy makers. This paper summarizes the indigenous knowledge practiced by communities living in Malbe grazing unit, Elwaye of Borana Zone to cope their life with changing climate and sustain limited natural resources utilization.

2. Background

Ethiopia is home to Africa's largest livestock population, which is largely concentrated in pastoralist areas. Pastoral livelihoods are highly vulnerable to drought, animal disease outbreaks and other disturbances. Pastoralism has historically been a sustainable livelihood option. However, increased environmental stresses and changes in policies and practices, including restricting access to land and water, have increased the environmental impacts of pastoralism. Despite the environmental challenges facing pastoralists, they have traditionally managed dry lands sustainably and delivered a number of positive benefits for biodiversity. For example, in many cases, sustainable grazing practices actually increase species diversity and maintain ecosystem structures.

Pastoralism is typically based on local management systems for the sustainable use of wild and domesticated species. When practiced sustainably, pastoralism also encourages plant and landscape diversity. As users of grazing lands who are reliant upon the continued provision of such ecosystem services, pastoralists have a unique knowledge of how to achieve and maintain a balance between conservation and sustainable use. For instance grazing land management, especially in drought-prone areas, is a complex process requiring a balance between the use of water, food, fodder, fuel wood, and other resources. Where traditional pastoral livelihoods and management practices are replaced or restricted, however, the degradation of critical ecosystem services often follows. Therefore, integrating indigenous and local knowledge, innovations & practices; securing land and water rights; mainstreaming gender within pastoralism can contribute positively to biodiversity conservation and poverty reduction.

3. Study Location

The Borana zone is one of 13 administrative zones within Oromia National Regional State. It is located between 3°36 – 6°38'North latitude and 3°43'- 39°30' East longitude and borders Kenya in the south, Somali Regional Government in the east, and the Ethiopian highland districts in the north. The Borana rangelands cover an area of about 50,000 km^2 of which 75% consists of lowland, and frequently exposed to droughts. Based on CSA (2017) population census, the Borana administrative zone is currently inhabited by a projected population of about 1.2 million people.

The Borana rangelands are characterized by an arid and semi-arid climate, with pockets of sub-humid zones. The average annual rainfall varies between 350 mm and 900 mm with a considerable variability of 21 to 68% among years. Rainfall is characterized by bimodal, with 60% of the annual rainfall occurring between March and May (main rainy-season) followed by a minor peak between September and November (small rainy-season). The long-term variability in the quantity and the distribution of the rainfall results in recurrent droughts in the area. In the past, droughts lasting several years occurred approximately once in 20 years and isolated dry years (< 400 mm) once in five years (Coppock, 1994). Recently, the period between droughts has decreased to 5 years, and the latest drought was observed only 3 years after the previous one.

The topography in the Borana rangelands is distinguished by plain rangelands, intersected with occasional mountain ranges, volcanic cones and depressions, and an altitude between 750 and 1700 m.a.s.l. They are dominated by tropical savannah vegetation, with varying proportions of open grasslands, and perennial herbaceous and woody vegetation (Alemayehu, 2002).

Elwayyee Anna is one among thirteen districts found in the Borana Zone of Oromia Regional State. Elwayyee Anna is characterized by pastoral and agro pastoral livelihood system as a whole and livestock rearing is the major livelihood of the people living in the district. It is situated at 597 km south of Addis Ababa and 28 Km from Yabello town. Administratively, the District is divided into ten pastoral associations (PAs) of which nine are rural pastoralist associations and one is urban. The total population of Elwayye Anna is estimated to 65,732 of which 34,562 and 31,170 are Males and Females respectively and total HHs is estimated to be 5638 male, 3713 female total 9,363. The District is bordered with Yaballo Anna in the West, Gomole district in the north, Dugda Dawa district of West Guji Zone in the North, Taltallee district in the East, Dillo district in South and Konso of SNNPR in Northeast.

The topography of Elwayyee Anna includes a mountain range, craters and gently undulating & flat plains. The altitudinal range varies from 1,450 – 2,200 meters above sea level. Rainfall pattern in Elwayyee Anna is bi-modal in character, where there are two rainy seasons in a year**.** About 60-70**%** of the total annual rainfall is received in the long rainy season, which extends from March to May, while the remaining rainfall is received in short rainy season that extends from September to November. The rainfall pattern can be characterized as erratic, unpredictable, and unreliable. Indeed, the delay and/or absence of one rainy season causes widespread livestock mortality, crop failure, and subsequent food and water shortage for the settled and mobile population of the area.

During the sixteenth and seventeenth centuries, when various peoples were fighting over economic resources in the Horn of Africa, the Oromo were effectively organized under the Gada institution for both offensive and defensive wars. Indeed, Borana range land presents an exceptionally efficient and well managed dry land areas due to the indigenous knowledge of Borana, richness of natural resources ,the wealth of Borana institutions and their capacity to regulate access to resources (Watson ,2001). And the strong interaction among multiple institutions; effective channel of communication; check and balance and transparency within Gada system is the secret achievement within the centuries.

The Borana have an elaborate well centered system of clan association through which other (associated) clans can claim right of access to wells other than their own. It defines not only those who are entitled to access certain wells, but also the order of priority for watering animals among those with entitlement. Well are not the only economic resources of Borana Oromo but also the central institutions by which the society is organized and moreover it is a symbolic representation of Borana (Tache, 2010). Moreover, management of water as a common property

resource in Borana remains relatively intact up to today (Tache and Irwin, 2011). For Borana natural resources are common property in spite of a specific provisions based on the principles of exclusion/inclusion for the assurance of balanced and sustainable use of natural resources called the *Seera Marraa Bisaanii*. 'Law of pasture and water'.

Additionally, Harrison (2015) argued that "cultural" heritages are connected with "natural" heritage concerns; "the environment" comes to be seen as a "social" issue as much as it does a "natural" one. Nonetheless, heritage has simultaneously, through its infiltration of almost every part of our lives, become an important language by which people globally attribute value and express a sense of care for special objects, places, and practices. As a result, the common attributes and values attached to the environment via their daily interaction, affiliation they had to these resources; spiritual attachment they had with it and traditional institutions in relation developed in line with nature are the common attributes that makes the Gada system successful in range land and water resource management in addition to other natural

The traditional pastoral system in Elwayye Anna is based on wet season grazing with cattle watering at ponds and dry season grazing close to deep wells (Eelaas). The longer animals stayed on wet season the better would be the range, because this would help conserve dry season forage and delay use of the wells, which in turn conserves ground water. However, the proliferation of water points as a result of inappropriate development interventions in the past exacerbated heavy grazing in dry season grazing areas disturbing the traditional range management of the pastoralists.

In a system of agricultural production where animal husbandry is the main stay of livelihood any factor that, directly or indirectly affect the production and productivity of animals will immediately be reflected on house hold food supply system. As the past repeated occurrence of drought and acute food shortage problem in the area show, the main causes of such problems are the failure of rains, which include complete absent, erratic distribution or inadequate amount in space and time.

4. Objectives of this documentation

4.1. General Objectives

- To identify and document indigenous knowledge for better sustainable resource management in Pastoral and Agro Pastoral areas.

4.2. Specific Objectives

- To strengthen customary institutions in Malbe grazing unit for local development activities.
- Preserving, safeguarding or promoting IK and transmitting it to future generations
- Making IK available in a more systematized manner to a wider audience
- To support inclusion of customary institution through inclusive policy support

5. The Rational of IK

IK is the basis for local level decision-making in food security, human and animal health, education, NRM, and other vital economic and social activities. Therefore, this documentation contributes to:

- Incorporation of IK into research –extension and build upon local empowerment /Local capacity-building/ and, increasing self-sufficiency and strengthening self-determination.
- Utilization of its output so as to give legitimacy and credibility in the eyes of both local people and outsiders, and increases cultural pride and thus motivation to solve local problems with local resources.
- Help to illustrate the effort of indigenous people by providing valuable input about the local environment and effective management of its natural resources and scaling up where appropriate.
- Integrating indigenous and local knowledge, innovations & practices; and mainstreaming gender.

6. Documentation Methodologies

The data collection was qualitative approach and 12 (1 female) grazing unit committee have participated in FGD. This committee are purposively selected as they have managed this grazing unit and gained the indigenous knowledge from their ancestors orally or through imitations and demonstrations. So we have interviewed this local elders to collect all necessary information used in this documentation that have recorded audio visually. Different literature also reviewed to support the documentation and secondary data avail at Anna and Zonal level also used for the documentation. After data collection done, draft of the document is prepared by RCST experts and reviewed by regional experts. Then the final document is printed and disseminated to all concerned bodies at all level.

Photo: FGD with Malbe grazing unit committees

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7. Results gained from the documentation

7.1. The Practice of Indigenous Knowledge Based Natural Resource Management and Utilization Strategies in Dheeda Malbee

Based on key informant and FGD participants' explanations, this study identified the subsequent customary NRM and utilization strategies that have been practiced to sustain their natural resources by pastoralists at Dheeda Malbee (Malbe grazing unit).

7.1.1. Rangeland Management and Utilization Strategies

a. Rangeland taxonomy

Banking upon customary institutional practice pastoralists of Dheeda Malbee divided the entire rangeland into two main parts on the foundations of their functions and cyclical grazing dimensions called 'lafa warra guddaa' (land for home-based livestock) and 'lafa gu'eessa' (land for non-lactating livestock). According to informants, land for 'lafa warra guda' was supplementary divided into three segments based on their functions, namely *lafa jabbi* (land for calves), *lafa hawicha* (land for lactating cows) and *lafa qubsuma* (land for settlements). As they are yet pure pastoralists, farming was not practiced in Elwaye district. By contrast, the Borana pastoralists that live in other districts of Borana zone have practiced trivial scale farming in the vicinity of *lafa warra gudda*.

Among the Borana pastoralists the taxonomy of rangeland into *lafa warra guddaa* and *lafa gu'eessa* was implemented through the agreements between the customary leaders as well as community members who delegated from their respective geographical units. So, as to accomplish this, firstly *jaarsaa reera* (customary leaders for groups of adjacent encampment clusters) and community representative from each *reera* (groups of adjacent encampment clusters), were authorized to delimit gazing land between *lafa warra guddaa* and *lafa gu'eessa*. Then on the second phase *jaarsaa ardaa* (customary leaders for groups of villages), *abba olla* (village head) and community members from *ardaa* (groups of villages) emanate together to delimit the boundary of grazing land for *hawwichaa* (lactating cows), *jabbii* (calves) and *qubsuma* (settlements), respectively. In contrast, *lafa gu'eessa* cannot be segmented into varied land utilities unlike *lafa hawwichaa* as the livestock that migrated to *lafa gu'eessa* solely comprises pregnant cows, prevented calves and oxen.

b. Abburu

According to the Malbe elders '*abburu'* (scouts) is the practice of sending skilful herder by customary leaders to conduct assessments on the rainfall and pasture availabilities to remote areas. Predominantly, assessments on water and pasture availability are piloted soon after the early rainy season of '*ganna'* (March to May) and *hagayya* (September to November) when rain commences or when drought season is extended to restrain the leverages of overgrazing in *lafa warra gudda*. Therefore, the time and the number of livestock that proposed to migrate to assessed areas are typically based on the availability of pasture and water resources and other relevant figures

acquired by the scouts. Additionally, scouts also assess the transitory satellite camp for non-lactating livestock that intended to migrate to scouted areas. Moreover, key informants itemized that:

"Prior to sending *abburu* squad to conduct assessments, customary elders [*i.e.*, jaarsaa *reera, jaarsaa arda* and *abba olla*] discuss the places of assessments. After they agreed on the places of assessments, they let the scouts to conduct evaluations. Once the scouts return from assessments, customary elders query them by saying *maniin galtanii* (literally asking for the results of their assessments). If the scouts return with prolific assessment results, they reply to customary elders by saying *godaanaan galle* (we come back with mobility) after they thoroughly searched the results of evaluations. The customary elders then recommend the migration of non-lactating livestock to scouted areas. In the course of the drought time, they would settle near traditional deep wells; if not drought time, they would encamp in the areas where either small ponds or *dololo* (surface water) are accessible."

c. *Cattle* mobility

For Dheeda malbee pastoralists, cattle mobility is one of the utmost accustomed means of getting what livestock need in an erratic environmental situation. They used cattle mobility as strategies for managing scanty rangeland resource in a sustainable way. According to key informants and FGD participants, there are two types of cattle mobility, namely: *godansa warra guda* and *godansa gu'essa*. *Godansa warra guda* is the customary practice of cattle mobility that comprises the migration of entire family and livestock. Customarily, this type of cattle mobility was practised by Borana pastoralists when drought period is too protracted. They would migrate to other areas where abundant pasture and water resources are available. *Godansa gu'essa* is also the types of cattle mobility which predominantly consists of steers, pregnant cows and dissuaded calves. Livestock habitually migrate with young male herders on the onset of rainy seasons to search water and pastureland. One key informant stated the following, regarding the cattle mobility:

"Usually, we migrate our livestock to Mata-wayama rainy season grazing land areas shortly after the *ganna* or *hagayya* rain. In addition, when the *bonna* (drought) period is extended, we would move our livestock to faraway areas along Golbo rangeland unit (proximate to Ethio-Kenya margin) and Konso zone administration to access water and pasture for our drought-stricken livestock." As a result, the customary practice of mobility-based livestock classification helped Borana pastoralists to utilize inadequate rangeland and water resources in *lafa warra guda* and *lafa gu'essa* more adeptly.

d. *Herd* splitting

Herd splitting was cited by informants as the practice of dividing livestock in accordance with their similarities and pasture preferences. The Borana pastoralists herd flocks of camel and cattle separately, as each of them requires different pastures, environmental adaptation and herding styles (i.e., camels entirely feed on tree leaves and branches, whereas cattle solely prefer grasses). By contrast, small ruminants such as sheep (grazer) and goat (browser) are flocked together. Occasionally, Borana pastoralists in Malbe grazing unit keep herds of goat

separately in the areas where there is a high prevalence of bush infringement. As goats are dominantly feed on shrubbery leaves; thus, it would help to limit the incidence of bush invasion.

Typically, the customary practice of herd splitting depends on livestock possession, as it was mostly practiced by households with considerable number of livestock. In some cases, households with small herd size shepherd cattle, sheep and goat flocks together. However, they never shepherd camels with other flocks of livestock owing to their inimitable shepherding style and enormity of their corporeal appearance.

e. Bush burning

The pastoralists around Malbee grazing unit traditionally have practiced bush burning techniques to boost rangeland productivity, to control thorny bush, to wipe-out ticks and to provide plenty of forage for livestock during the drought period. According to Malbe grazing unit elders from Elwaye, the particular areas of grassland that required to be burnt would be identified through qualified customary leaders. The identified part of the rangeland is scorched late in the evening when there is moderate heat and wind, and rainfall is anticipated soon to elude any opportunity of fire that may spread into adjoining grazing reserves and human settlements. Furthermore, after the identified part of the rangeland is scorched the fire is controlled by *kara ibida*. *Kara ibida* is the practice of making paths (roughly 2-3 meter wide) through slashing of grass and trees between proposed grassland for burning, and adjacent villages and rangeland areas to halt the fire from diffusing into proximate villages and grazing lands.

According to informants, pastoralists of this area classify bush burning in to three main categories on the bases of their burning cycles. There are three categories are as follows:

Guba - A particular rangeland area that burned every year. This annually burned grassland has a higher yield in contrast to *gursumessa* and *fura* types of bush burning.

Gursumessa - A burned grass land that functioned only one year after burning and then burned every second year.

Fura - A pastureland which is unburned for long period of growth season. This unburned grassland has lower productivity in contrast to *guba* and *gursumessa* which burned annually and every second year, respectively.

7.1.2. Power *Decentralization*

The decisions for grazing management at *dheeda level* on the bases of pasture and water resources availability was applied under the supervision of *jaarsaa dheeda*. The customary leader of *jaarsaa dheeda* was responsible for governing the grazing precincts across the Malbe rangeland unit of Elwaye district. The decision made by the customary leader of *jaarsaa dheeda* has considerable powers including the penalizing of convicts that violated the customary governance of pastureland. Thus, *jaarsaa dheeda* has the ultimate authority to make final verdicts on the issues related to collective pastureland management and configuration of cattle mobility across the Malbe rangeland unit of Elwaye district. Correspondingly, the tasks for handling rangeland at *reera* and *arda* levels were given to customary leaders of *jaarsaa reera* and *jaarsaa arda,* respectively. The management at the *olla* (village) level

is given to *abbaa ollaa* to execute the rulings made by *jaarsaa dheeda*, *jaarsaa reeraa* and *jaarsaa ardaa*. As consequences, these customary institutions have played an energetic role in managing the delivery and access to pastureland in faithful and equal ways.

7.1.3. Dongora seeraa (Settlement Rule)

The Borana pastoralists have their own customary settlement rule (*dongora sera*) that obliges every member of the encampment clusters to encamp in straight line with the others; thereby, settlements are in parallel side to the grazing lands. According to this customary settlement rule, no one is endorsed to encamp in dry and wet season grazing reserves and in forward facing of the other fellow villagers. This customary practice is commonly used by Borana pastoralists to pasture for the dire time, to broaden grazing land scope as well as to hinder inflowing of human settlement into the adjoining dry and rainy season grazing land areas.

According to an informant, "*each ardaa has its own mataa-tikaa (grazing parameter) that served as the ultimate boundary between them; through this rehearsal flock of livestock from two different ardaa reach grazing climax in a diurnal and cannot be side-stepped by cattle keepers from neither of the adjacent encampment clusters*." Hence, any cattle keepers who deliberately violated the customary practice of *dongora sera* would face punishment as per customary rules of rangeland management.

7.2. Customary Institutions of Water Management and Utilization Strategies

7.2.1. *Konfi*

In Malbe grazing unit pastoralists have developed the complex varieties of customary institutions to systematically manage the utilization of deep wells and ponds in their localities. A key informant stated that: "When a particular *eelaa/tuulaa* (deep well) or *haroo* (pond) was excavated, the person who discovered the stream of the e*elaa* or *haroo* through the process of *jinfeessuu* (digging firstly the supposed deep well stream's area three or four times by hoe as insignia for discoverer) was entitled to the *konfii* (initiator). He is considered as *abbaa eelaa* (father of the well), and he would administer the day-to-day operation of the e*elaa* or *haroo* through *abbaa herregaa* (manager for daily watering order)."

This right is mainly claimed by the initiator of the deep well as well as those belonging to the clans of the deep well founder. For instance, if the *konfii* is from Digaluu clan of Borana pastoralists, the deep wells also belong to entire Digalu clan. However, key informants and FGD participants confirmed that, as it was a common property for all Borana pastoralists, the ownership of the deep wells is not changed into an absolute clan property. As a result, each member of the Borana pastoralists is customarily permitted to let their livestock drink water regardless of their clan's origin. Furthermore, key informants explained that "if other ethnic group request water for their cattle based on the customary water rules and regulations. In this grazing unit Borana pastoralists cannot deny any non-Borana people."

7.2.2. *Abbaa Herregaa*

The duty of the routine supervision of deep wells and ponds is given to the *abba herregaa*. The selection of *abba herregaa* is primarily based on the avoidance of conflict and his fidelity among the users irrespective of his clan origin and affiliation to deep wells and ponds initiators. According to customary elders, deep wells serve its customers based on customary practice of *eelli qaraa fi eegee qaba* (deep wells have first and last served) utilization rules. Therefore, the rules of access to the deep wells are determined by *sadden* (watering cattle every three days). To use the water, *guyyaa qaraa* (the first day) priority is given to *konfi* (on *guyyaa qaraa* no livestock can drink before *konfi's* livestock drinks); and then *guyyaa lammeessoo* (the second day) priority is given to *abbaa herregaa*. The *guyyaa sadeessoo* (the third day) is for *mandhicha* (seniority based on age among the *konfii* clan members), thus eldest person's cattle are permitted to drink before any queued cattle on third day.

However, unlike the rules of access to the deep wells, the access to ponds is not managed through the customary rules of *sadden*. In the occurrence of ponds, *konfii* is not entitled to claim ownership right over pond. As a result, the utilization of ponds is not founded on the priority distribution of water, unlike the deep wells where first three days priority is given to *konfii, abbaa herregaa* and *mandhicha,* respectively, based on the customary rules of *sadeen*. The other unique feature, that distinguishes the utilization of ponds from that of deep wells, is called *meri*. *Meri* is a thin tree branch that is used to hinder cattle from directly entering a watercourse. However, in case of the deep wells there is no *meri*, instead they depend on the *naaniga* (tiny trough) to drink the cattle. Therefore, water dragged from the deep wells through *tootuu* (hierarchies of water transporters) firstly into *facaanaa* (wider trough) and then into *naanniga,* serving the livestock directly. Furthermore, to ensure the sustainable utilization of deep wells and ponds, every user has a duty to clean its compound as well as water troughs on regular basis prior to drinking their livestock.

Natural resource management among dheeda malbee pastoralists is based on democratic system of Gada system: democratic selection of leadership; training through ritual activity; formation of law; participatory and transparent decision making in different assemblies. Having defined administrative units at different level helps the traditional communities in decentralization of governance, equitable access to resources, and development of solidarity among people.

7.3. The Perception of Local Communities on Indigenous Knowledge

The Borana pastoralists around Dheeda Malbee have their own IK for water and rangeland management. The customary management of rangeland and water resources and its utilization strategies were acquired by local communities through daily personal interactions beginning from childhood when they play with their friends and shepherd cattle. As per FGD participants' views, "the local communities have knowledge of customary rangeland and water management and its utilization strategies." However, the nature of the perceptions is not identical across all members of the communities.

Some informants in FGD articulated that: "Youth perceptions on the IK are not wide-ranging in contrast to adult and elder members of the communities owing to numerous youth enrolment into modern education and the introduction of alien technologies into customary NRM of Borana pastoralists at frightening rate. Such factors have contributed for dissimilarities in perceptions. Hence, community members progressively continue to disobey and swap IK and customary rules with the modern systems."

In addition, the result of FDG shows that "transformation in the utilizations of IK was founded upon intended determinations by members of the local community to seek solutions to their existing problems through local trial and error methods." Conversely, there are some kinds of perceptions in which the skill of undertaking is always kept secret from local communities and is uttered merely to the family of the experts or nearest relatives. This secret transfer of expertise is highly observed among *ciressa* (traditional healer) and traditional weather forecaster. However, informants stated that "the sustainability of the IK of Borana pastoralists is doubtful, as it is transferred from one generation to another through the words of mouth, while exclusively depending on customary leaders."

7.4. Challenges on Pastoralists' IK in Malbe grazing unit

The outcome from the focus group discussions with committee of Dheeda malbee (Malbee grazing unit) indicates that, this interesting system of rangeland management (IK) has been currently facing a serious threat from many sides. From time to time the smooth functioning of IK on the rangeland management has been weakening. On the views of discussions with the elders and committee, the constrains to IK-based rangeland management was from external interventions like intervention of state (kebele administration) in the power of elders, inappropriate development concepts without community soundings like construction of permanent water ponds, and lack of pastoral oriented extension and ban of controlled burning of bushes. According to the informants, the foremost challenges that were encountered by the IK of Malbe grazing unit pastoralists are mentioned as follows:

7.4.1. *Conflict over Boundary and Grazing Areas*

According to pastoralists living in Malbe grazing unit, unresolved boundary entitlements of this dheedaa (grazing unit) was intensified following the absenteeism of cut boundary demarcation and legality given on this areas. It triggered this pastoralists to lose their rainy season grazing land areas and there is illegal settlers, herders and there is no support from governmental institutions to solve this aforementioned problems.

Consequently, the IK and customary institutions have encountered perilous challenges owing to the prevalence of conflicts, alienation of rainy season transitory areas, and the environmental degradations that happened because of reduction in rangeland assets.

7.4.2. *Environmental Degradation*

Nowadays, the prime challenges for the IK of Borana pastoralists are the alienation of rainy season rangeland areas, perpetual conflicts, increasing number of livestock and human population have furthered pressure on the earlier degraded environments. According to informants and field observations, there is evidence that environmental degradation interrupted the configuration of cattle mobility through thinning *lafa warra guddaa* and *lafa gu'eessa*

pastureland areas. Consequently, unceasing environmental degradation had accelerated the deterioration of the IK in addition to various internal and external interferences that undermined their practicality.

7.4.3. *Drought*

In Elwaye district, perennial drought has created substantial threats for the sustainability of the IK of Borana pastoralists. Previously, Borana pastoralists were capable to deal with drought impacts as they were customarily accomplished to migrate to new productive grassland areas. Nonetheless, discussions with FGD participants indicated that "in the past two decades recurrent drought resulted in extreme environmental degradation and livestock fatalities owing to drought cycles condensation from 10-12 years to 3-4 years."

7.4.4. *Population Pressure*

The customary practice of rangeland management comes under pressure when human population increases. Nevertheless, informants commonly cited that the hasty growth of human populace has triggered detrimental consequences for the IK of malbee pastoralists. For that reason, currently in Elwaye district under the continuously burgeoning population pressure, the distance between two adjacent groups of villages is progressively shrinking due to unprecedented population growth. It inflicted the malbee pastoralists to encamp in the formerly circumscribed dry and rainy season rangeland areas. Hence, the challenges to the IK of malbee pastoralists are accelerated, consequently.

7.4.5. *Weakening of Customary Institutions*

The customary institutions of pastoralists in *dheeda malbee* are constituted on leadership schemes that govern the daily management and utilization of rangeland and water resources. However, informants reported that: "Nowadays, the power of our customary leaders and NRM institutions are deteriorating. Even though we used the customary rules to manage our grazing land and water resources for centuries, government proposed institutions, bans on customary practices (*i.e.*, *bans on bush burning*) and unfitting external interventions have intensely paved the way for steadily decaying of our customary institutions than ever before."

7.4.6. *Decline of Dry and Wet Season Grazing Reserves*

The customary practice of keeping grazing reserves in *lafa warra guda* and *lafa gu'essa* by the Borana pastoralists of Elwaye district was centred on the seasonal livestock mobility patterns. However, currently, the tradition of keeping dry and wet season grazing reserves is coming under potent pressure and consistently shortening in Elwaye district due to the decrease of grazing reserves of both lactating and non-lactating livestock. It is triggered by environmental degradation, rangeland alienation, thorny bush invasion, drought, and population growth.

7.4.7. *Bush Invasion*

Traditionally, Borana pastoralists practiced rotational burning of rangeland areas as a mechanism to regulate undesirable grass species, to refurbish pastures and to confiscate unpalatable thorny bush species. Though, the rapid incursion of thorny bush species that never have a merit to the livestock has generated detrimental trends for

the environmental productivity and sustainability of Borana pastoralists' rangeland in Elwaye district. The participants of the study revealed that the leading reason for bush invasion on the rangelands of Borana pastoralists nowadays is an incorrect government ban of the traditional bush burning practices according to informants. Accordingly, this restriction of bush burning practice for the last three consecutive decades has intensified the disruption of the Borana pastoralists' traditional natural resource governance system in conjunction with unceasing environmental degradation, recurrent drought and conflict, etc. in all pastoral areas of Dheeda malbee(Malbee grazing unit).

8. Lesson Learned from this Documentation

It is learned that there is a unique knowledge of rangeland management in Borana specially Malbe grazing unit. According to informants, in the past the strength of pastoralist IK for rangeland managemant is very good and served as the social capital of the poor. The evidence presented in this documentation showed that mobility of herd, customary institutions, herd splitting and management of traditional enclosure are the main IK in rangeland management. At present day movement by home is minimized because of pastoralist permanent settlement and mobility is by stock. Customary institution of natural resource and rangeland management is not functioning well. This is because of inappropriate development policy that undermined this local knowledge and expansion of crop cultivation. However, the dependence on customary institution manages rangeland better. The use of traditional enclosure enables pastoralist reserve the forage for the time of difficulty. Herd splitting into different categories and diversification were identified as a means in which pastoralists adopt to degrading environment and uses the declining rangeland resources sustainably.

The smooth functioning of IK based rangeland management was disturbed. The severe disturbances to indigenous knowledge based rangeland management are from external intervention like inappropriate extension services and development polices. Power of elders, Jaarsa dheeda (elders of grazing) and Jaarsa madda (elders of watering) was intervened by kebele leaders. An extension service and inappropriate development message that does not go with pastoral community has considerable impacts on the well function of IK. Again the policy that has banned the controlled burning for rangeland is against the traditional knowledge of Malbe pastoralist in rangeland management.

The other reason for declining of the power of decision making of the elder is the intervention of kebele leaders and leader of each *reera* in the management of rangeland. Throughout the encampments in the study areas, younger community members and *abbootii reera* (father of each *reera*), in experienced in rangeland management, were appointed and given the powers of decision making at the local level. The power they were given was the power of elders. They concentrated on public security and political control, but gave little consideration to the rangelands.

9. Conclusion and Recommendation

9.1. Conclusion

The Borana pastoralists have hierarchies of traditional NRM structures that integrate the customary rules and regulations to ensure the sustainable management and impartial accessibility of the rangeland and water resources to all peoples. The maintenances of such customary rulings are executed by customary leaders of water and rangeland resources. For instance, dheeda is the single largest portion of rangeland segmentation that is managed through jaarsaa dheeda. As discussed in preceding section, jaarsaa dheeda has the authority to supervise the proper utilization of rangeland unit as well as schemes of cattle mobility. Jaarsaa madda is also the customary leader who manages areas related to permanent deep wells that structured according to imminence of water-stream clusters. Congruently, Abba herrega is liable for daily utilization of drinking mandate and monitoring mismanagement of water resources.

When any members of the communities despoiled the customary rules of water and rangeland management, these customary leaders have the authority to punish the offenders as per the pastoralists' customary laws of rangeland and water resources management. For instance, when members of the communities defy the customary utilization of water and rangeland management, customary elders would apply the following sentences: persons that violated customary management of rangeland (reared livestock in restricted areas) would be penalized from 1-5 cattle depending on the gravity of offender's offense.

9.2. Recommendation

The future development direction in Borana lowland should support indigenous knowledge of pastoralist in natural resource management in general and rangeland management in particular. NGOs, Woreda and Zonal Pastoral Development Offices should stand beside pastoralist in supporting and integrating indigenous and technical knowledge for sustainable management of rangeland. Management of traditional enclosure, mobility and herd splitting should be inextricably linked and managed in accordance to customary institution of pastoralist. Rangeland development and extension services of the government should be built on pastoral indigenous rangelands knowledge. Local and regional monitoring of rangelands problems should use local knowledge to focus the problem in detail.

According to informants from Dheeda Malbe their life is sustained due to the presence of well-organized traditional knowledge for rangeland management, water resource utilization system and dissemination of weather forecast information from local experts to local communities. So we argue that this practically tested knowledge should be documented and any rangeland development policy and programs should take into account IK of pastoralist and policies aimed to improve livelihoods of pastoralist should consider the structure of pastoralists.

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