

Resource use planning under climate change: Experience from Turkana and Pokot pastoralists of Northwestern Kenya

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Abstract

There is a growing concern over access to dry season grazing pasture and water in the arid and drought prone areas of North-western Kenya, where pastoralist communities are constrained by poor access to basic services. This is being exacerbated by the effects of climate variability and climate change which have contributed to depletion of livestock-based livelihoods resulting to reduced mobility of livestock and thus disrupting the process of adjustment that maintains the balance between people, livestock and the environment. This paper present the experiences and lessons learned in resource use planning process amongst the Turkana and Pokot pastoralists with special focus on means to increase sustainable access to pasture and water. The experiences documented were implemented in year during implementation of Drought Mitigation Initiative project. Land use plans and inter-community reciprocal grazing agreements were developed to include land rights and cross-boundary resource use. Constrains to resource use planning in the region were identified and revolved around environmental, socio-economic, institutional and legal issues. Policy backed resource use planning as enshrined in the Draft National Land Policy is the most suitable approach to govern use of limited resources in the rangelands, and to negotiate over tenure, access and resources stewardship rights.

Key words: Resource use planning, Turkana, Pokot, pastoralists, rangelands

1 Introduction

During the past two decades, the concept of resource use planning has emerged to be one of the most suitable innovative techniques of utilizing limited key resources in arid and semi-arid areas (rangelands) (Roberts 1991; FAO 1993; Morton 2001). Resource use planning has also become an avenue for negotiations over tenure, access and resources stewardship rights in the rangelands.. Research studies (Behnke and Scoones 1993; Opiyo et al. 2009) in East Africa rangelands indicate that pastoralists are constrained by poor access to pasture and water. This situation has been exacerbated by the effects of periodic drought, insecurity, pests and diseases outbreaks, ethnic and resource-use conflicts, and depletion of livestock-based livelihood assets, reduced mobility of livestock which has disrupted the process of adjustment that maintains the balance between people, land, livestock and wildlife.

Estimates show that between 15 and 21 percent of northwestern Kenyan rangelands remain inaccessible each year (Ellis and Swift 1988; Morton 2001). In these rangelands, resource use conflicts are a common feature mainly because of land use transformations, population growth and increased resource scarcity. The resource use conflicts usually occur around key natural resources: water, pasture and land for settlement. Demand for the hitherto dwindling water and pasture resources has heightened the conflicts, which tend to be seasonal in nature and increases during the dry season (Oguge, 2006). The conflicts have pitted communities against each other, and often result in loss of life and property. It is possible to expect natural resource use conflicts to increase in the rangelands in future with increasing resource scarcity, which is aggravated by the effects of climatic variability and climate change.

Majority of land resources in arid and semi-arid areas are held under a communal but controlled access system (McCabe 1990). However, due to burgeoning human and livestock populations, vast communal grazing lands in Kenyan arid zones are increasingly becoming degraded (de Leeuw and Reid 1995; Mworira and Kinyamario 2008; Nyangito et al. 2008). With combined effects of climatic variability and un-planned resource use, the arid environments are undergoing continuous and accelerated degradation to new stable states. This common observation has triggered focus on remedial intervention. While embedded in the Drought Cycle Management, resource use planning is increasingly being seen as a key tool for achieving greater integration which best meets the needs of the people while safeguarding rangeland resources to enhance livestock productivity and conserve environment for posterity. This paper thus documents experiences on participatory resource use planning in northwestern Kenya rangelands as an instrument for empowering pastoral communities to increase sustainable access to dry season key resources - pasture and water. The paper also demonstrates how resource use planning can be applied to cushion pastoralists against the effects of climate change and shocks.

1.1 Integrated land use planning principle

The principles advanced in resource use planning in arid and semi-arid areas (Roberts 1991; Morton 2001) showed that decisions on resource allocations or land use recommendation for competing uses must begin with;

- The traditional knowledge on how the pastoral communities presently use their rangelands;
- Land use zoning based on land productivity potential;
- Land use types designed to be suitable and economically viable, while at the same time maintaining or enhancing ecosystem integrity;
- Pastoral mobility that is key to resource use management and sustainability

Resource use planning in the arid and environments is embedded in the Drought Cycle Management (DCM) process (Fig. 1) (IIRR, 2008), where the two are implemented concurrently.



Figure 1: The Drought Cycle Management Model above illustrates a conceptual model of the progression of drought and corresponding activities for each stage

1.2 The Northwestern Kenya rangelands

Northwestern Kenya rangelands are unique in that the resources are accessed by a number of pastoral communities, especially the Turkana and Pokot pastoralists (Opiyo 2008). Over the years, these lands have always provided common dry season grazing ground for the two ethnic groups. Occasionally, they have also been an important dry season grazing fields for the Jiye, Karamojong and Dodos from northeastern Uganda, the Toposa, the Jiye of southeastern Sudan, and Nyangatom in southern border areas of Ethiopia (Muller 1989; Dyson-Hudson and McCabe 1985). Since independence, efforts towards utilizing these land resources in various ways have been put in place, mainly as grazing fields, irrigated farm

plots, national reserves, minerals and quarry mining, human settlements and ecotourism enterprises (Watson and Binbergen, 2008). Hence, the competition for use of land and its resources in the area has become intense over time.

The study area cover parts of greater Turkana and Pokot districts in the Rift valley province of Kenya. The districts receive an average annual rainfall of about 200mm in the east to over 500mm in the northwestern highlands. The rainfall is characterized by small total amounts, high seasonal and bimodal distribution, and high temporal and spatial variability between seasons and years. Annual mean temperatures experienced in the region range between 26⁰C to 38⁰C (Jaetzold and Schmidt 1983). The region towards Lokitaung, Kaikor and Lokichogio areas, where northwestern rangelands are found are very arid compared to the western rangelands found towards towards Uganda which are generally semi arid. The area lies in a region that has generally been classified as agro-ecological zones IV and V (Pratt and Gwynne 1977), with several pockets of riverine micro-climates along Turkwel and Kerio Rivers.

The vegetation in this area is mainly scattered *Acacia* bush, invasive *prosopis* and a cover of annual grassland and herbaceous plants. The density of the woody plants such as *Acacia reficiens* and *A. Mellifera* increases on hilly ground (Coppock et al. 1988). However, it is punctuated by *Maerua* sp. and *Acacia tortilis* along the riverines. Most woody species are used by camels and goats (Coppock et al. 1988; Mochabo et al. 2005) although small number is used by all stocks. Soils are weakly developed and are low in organic matter (Muchena and Van der Pouw 1981). The drainage condition of these soils ranges from well to poorly drained. Most of the mountains and major scarps that border Uganda are covered by *Cambisols* (Gwynne 1977). They have relatively high in natural fertility and have a texture finer than sandy loam. The only good arable soils are confined to the Ugandan border. The region is crisscrossed by numerous ephemeral rivers commonly referred as *laghas*. These have essentially alluvial soils characterized by silty sand deposited from overlaying coarse sand.

2 Methods of study

The experiences documented in this paper were implemented within year one of the Drought Mitigation Initiative project that ended in April 2009. Field visits were made to collect baseline information. Data collection involved participatory approaches and information gathered through rapid assessments, surveys, village dialogue meetings, and informal community discussions with village elders, herders and opinion leaders from Turkana and Pokot ethnic groups. Members of the village land use planning committee (VLUPC) in targeted areas in Turkana and Pokot were trained in workshops and seminars on resource use planning process and information generated were documented as meeting proceedings.

Discussion with herders, village elders and opinion leaders centered on the livestock species owned, grazing areas and seasons of grazing, livestock movement and types of movements, grazing rights, animal healthcare, water availability and use, problems of livestock production, issues of pasture and water access and conflicts, and land use types.

Focus group discussions involving local administrations such as chiefs, kraal elders, warrior leaders, from both ethnic communities were recorded separately. The issues were related to the major problems faced in accessing dry season pasture and water and how resource use planning can be applied to cushion them against the effects of climatic shocks. In addition to the field activities, relevant secondary literatures were reviewed and archive work obtained from Arid Land Resources Management Project (ALRMP) offices in Lodwar, Kapenguria and Chemilingot.

3 Results and Discussions

3.1 Turkana and Pokot livelihoods

Northwestern Kenya rangelands is occupied predominantly by two Nilotic ethnic groups - the Pokot and Turkana who mainly keep livestock such as cattle, shoats, donkey and camels, and are known to share particular lifestyle, economic patterns and value systems that define their traditional nomadic pastoralism (Coppock et al. 1988; McCabe 1990). The Pokot are traditional cattle owners who have increasingly adopted the camel keeping in recent years (DLPO Pokot East, per. comm). Turkana on the other hand are nomadic pastoralists who manage multiple species of livestock, comprised of camels, goats, sheep, cattle and donkeys. Since each species has distinct dietary needs, the Turkana are able to exploit different expanses of the range during any period of the year.

Livestock are the main source of food and income for these two ethnic communities. The camels, cattle and goats provide milk, which is taken fresh or used in tea. The animals are sold when cash is required to buy grains, or meet other domestic requirements. Majority of the Turkana and Pokot raise their animals purely for cultural prestige. However, a trend of more frequent and severe droughts, coupled with population growth, insecurity and disputes over grazing rights has forced some former Turkana and Pokot nomads to adopt to sedentary lifestyles (Aklilu and Wekesa 2002; Watson and Binbergen 2008). The result has been an increasing trend to diversification through experimentation with a range of non-pastoral livelihood options.

It has been reported that the main driver of livelihood diversification amongst communities in this region is recurrent droughts. Most new land use activities and enterprises are based on exploitation of the region's natural resources base. Examples include growing crops through irrigation along the Turkwel and Kerio Rivers and also along some seasonal rivers like Weiwei; harvesting of wild fruits (*Dobera glabra*, *Hyphaene compressa*, *Ziziphus mauritiana*, *Balanites rotundifolia*), and quarry mining in Kappedo, Lokwamusing and Kasei; manufacture of woven crafts by the Turkana, and fishing in Lake Turkana. Other income generating activities (IGAs) by both Turkana and Pokot in the study area include honey production, ecotourism, and charcoal production along Lodwar - Kapenguria highway, production of aloe gum species - *Aloe turkanensis*, *A. secundiflora* and *A. scabrifolia* besides running small-scale businesses.

Livestock kept consists of local breeds, mainly Small East African Zebu cattle, Red Maasai sheep and small East African goats. The animals are kept under free range in defined household grazing units locally referred as *adakar* by the Turkana and *achei* by the Pokot. However, sometimes in the dry season livestock are temporarily moved into cultivated fields to utilize crop residues along the rivers. The crops grown include different drought tolerant varieties of maize and sorghum; other crops include millet, cowpeas, green grams, pigeon peas and beans. Small-scale irrigation of horticultural crops is carried out in *Katilu*, *Lokori*, *Nakwamuru* and *Wei-Wei* areas. Results show that livestock production still remains central to the lives of Turkana and Pokot, and forms their economic base as it is more reliable than cultivation (Senior Chief Lokori per. comm). During droughts for example, animals die and crop fail, but some animals survive to build up the herd again. This forms a kind of insurance against unpredictable fortunes in the harsh environment.

3.2 Access to range resources

The problems of access to pasture and water resources in northwestern rangelands have worsened in the past decade following high frequency of recurrent droughts. While, the key strategy of the local pastoralists to cope with drought is herd mobility which aims to exploit spatially different areas of vegetation types and productivity (Galvin et al. 2001), herd mobility as a strategy similarly, requires a favorable environment in terms of land tenure and land use to allow access to and use of resources. However, with increasingly uncertain climatic conditions, and different impacts across these regions, the rangelands will need to be managed in a way that supports and promotes land uses that are more resilient to climatic variability. Of all the land uses in the arid lands, pastoralism is best placed to adapt to increased climatic variability (ODI, 2009). Due to mobility, pastoralism is less susceptible to changes in climate than sedentary land uses in ASALs, such as crop agriculture, livestock ranching and ecotourism. This in turn has implications on resource use, economic development and poverty alleviation. Pastoralism is a resilient, low input land use option known to perform well in variable climates of northern Kenya (Coppock et al. 1988; Galvin et al. 2001). It therefore presents a less risky and more robust investment opportunity in arid environments where other land use types are likely to fail.

Planned pasture resource exploitation is not a new concept amongst Turkana and Pokot pastoralists. The highly productive mountainous regions like the *Loima* hills, *Mogila* ranges, *Songot* hills and *Kasei* hills in the west were traditionally preserved for dry season grazing by these two ethnic communities (Ellis et al. 1987). Some of these dry season grazing zones have survived into the present, and are accessed by nomadic pastoralist during severe weather conditions. However, it was observed that they are presently threatened by expansion for arable use and a changing socio-ecological, administrative and economic context that makes existing traditional grazing pattern ineffective. Such land use change was reported to be one of the main drivers of desertification and biodiversity loss in these rangelands. To reverse this trend, it is important to understand and build on the adaptations of pastoralism and the indigenous knowledge on resource use planning.

Large areas of arid and semi-arid resources in northwestern rangelands have become more or less inaccessible to the Turkana and Pokot pastoralists, due to emerging inter-community ethnic tension and increased accessibility to automatic fire arms from the neighbouring countries. According to Turkana and Pokot elders, insecurity has of recent been almost exclusively caused by young warrior herders in possession of modern weapons who have developed a tendency to defy the elders who seem helpless. The consequence has been avoidance of remote rangelands due to risk of livestock raids (Morton 2001). Results show that the border regions between Turkana and Pokot, such as *Lokori, Napeiton, Lomelo, Kappedo, Amaler, Amolem, Nasolot, Sarmach, Turkwel, Lokirima* and *Sasak* areas have become increasingly inaccessible. As a result, the total area and overall diversity and condition of the remaining rangelands have declined, and due to cattle raids their accessibility has become constrained.

In assessing a strategy to enhance range resource use access, it was emphasized that local leaders and the planning committee promote sustainable utilization of grazing resources in their areas. However, result showed that even though land and other natural resources in the rangelands are 'communally owned', in practice there are some restrictions. For example, there is free access to natural surface water supplies; however, the wells dug by individuals in ephemeral riverbeds are 'owned' by those who dug them. The elders in most of the study area were responsible for enforcing customary laws and their decisions are respected by the community members. The consequence of disobeying the elders is punishable by offering a goat or cow for slaughter to the elders (DLPO Sigor, Pokot District per. comm.). It was reported that breakdown of such traditional governance structures in the region has resulted in increased insecurity, emanating from uncontrolled livestock raiding, inter-ethnic conflicts, with attendant injuries, loss of human life and property. Other resultant effects of breakdown of respected social order include reduced access to grazing land and deterioration of welfare status among the pastoralists. However, traditional institutions and governance structures will continue to play a key role in enforcing customary laws, quell the inter-ethnic tensions, and ensure that resource use plans developed are implemented and the reciprocal grazing agreements honoured, if traditional institutions of governance are strengthened.

3.3 Grazing movements and land use

Nomadic livestock production is the main land use activity in the study area, which makes use of the scattered rangeland resources on a large spatial scale (McCabe 1990; de Leeuw and Reid 1995; Opiyo 2008). Nomadism is a pastoralist strategy characterized by the movement of households and their herds from place to place in search of pasture and water resources (Ellis and Swift 1988; Behnke and Scoones 1993, Oba 2001; Eriksen et al., 2005). Amongst Turkana and Pokot ethnic groups, seasonal livestock migration follows relatively well-defined traditional stock routes that at time get disrupted by droughts, disease outbreaks, cattle raids, or inter-community conflicts.

In order to diversify the risks of drought, the Pokot's livestock movement often takes place from their homelands to the west towards areas bordering regions of Turkana South and East, then to Samburu districts and back after the rains. In *Nyangaitte* and *Ngaina* the Pokot herders move with their livestock herd during the dry season towards *Masol* hills where they graze for

one to two months before moving to *Chepaywat* in *Masol* between January and February. Between March and May, the Pokots from *Nyangaite* and *Ngaina* move their livestock herd to *Lotongot* in *Amolem*. If the long rains delay, one group move to *Sarmach*, *Turkwel*, *Kinuk*, *Nakwamuru* upto *Kaptir*, while another herding groups move to *Lomelo*, *Napeitom*, *Silale*, *Longewan* to *Suguta* valley (Fig. 2).

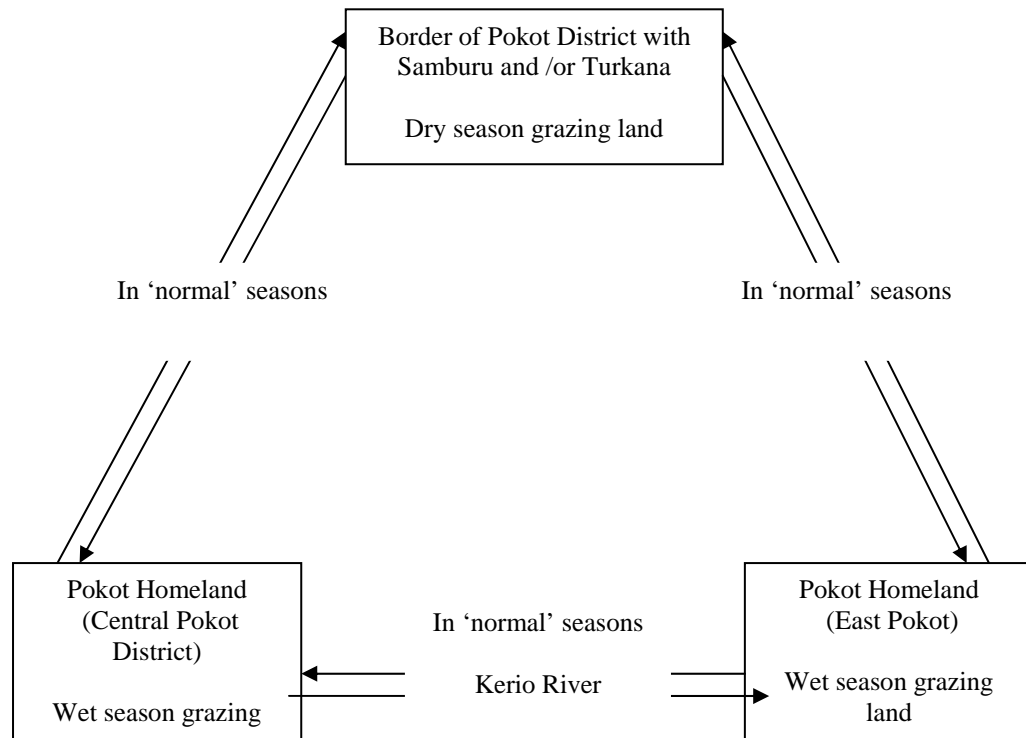


Figure 2: Livestock Movements in East and Central Pokot

Besides nomadic pastoralism, other land use types in the study area include irrigated and dryland farming, wildlife reserves, human settlements, apiculture and tourism-based activities. Cropping systems have encroached vast areas along Turkwel and Kerio rivers, and also along some seasonal rivers in the region (Watson and Binsbergen 2008). According to the locals, the encroached rangelands mainly include the best dry season grazing areas with easier access to water. They are the key resources ensuring the overall sustainability of the pastoral system. Such availability and access to natural resources in arid zones determines land use systems among other factors. Watson and Binsbergen (2008) emphasized the need of assessing land suitable for other alternative livelihoods in pastoral areas, based on result of scientific research but not predictions.

Information obtained from the elders indicated that the establishment of national reserves along the border regions in northwestern rangelands was largely done without discussion with local people. As a result, livestock mobility is increasingly being constrained by the

establishments of these (Nasolot and Turkana South National Reserves) wildlife reserves on livestock routes to the dry season pasture and water.

3.4 Current livestock production

Livestock production in the study area is characterized by low productivity caused by various constraints. Chief among these is poor and degraded rangelands, caused by drought and other related factors, which include insecurity, inadequate livestock marketing systems, diseases outbreaks and absence of veterinary care. Ellis *et al.* (1987) emphasized that poor resources planning and management that does not include such aspects as disease control and treatment, water development, pasture improvements and supplementation, are also a contributing factors to low productivity. These are, however, as a result of external forces, beyond the control of the pastoralists (Nyariki and Abeele 2004). Out of experience and in harmony with the environment, majority of pastoralists do practice competent animal management (Little, 1996; Homewood and Rogers, 1991).

Drought reduces the availability of pasture and water. In the absence of any meaningful veterinary care, drought drastically diminishes livestock immunity and resistance to diseases. Some of the common diseases in the region include; *Peste des Petits Ruminants* (PPR), East Coast Fever (ECF), Foot and Mouth disease (FMD), Mange, Rinderpest, tick infestation, *Contagious Bovine Pleuro-Pneumonia* (CBPP), and *Contagious Caprine Pleuro-Pneumonia* (CCPP). Mature cattle and calves were observed to be most vulnerable to drought, and heifers and dams reduced their calving rates, because of poor range condition. As a strategy for improving livestock diseases control, it was suggested that veterinary services be improved by training more community animal health workers (CAHWs) and stationing them into areas where livestock is concentrated rather than putting them in centers which are often too far from livestock grazing fields.

The need for more water in northwestern rangelands within dry-season grazing areas was recognized. The general feeling of the locals was that although there are numerous water sources in the region, they are not evenly distributed to support high population of livestock in the area during drought. Some areas have large number of water sources whereas other areas have none at all. Existing traditional water sources in the study area include ephemeral rivers, shallow wells, rock pools and springs in mountain areas. A number of boreholes and wells have been constructed in the area by Non-Governmental Organization (NGOs) and the government's Arid Land Resource Management Programme (ALRMP) (Aklilu and Wekesa 2002). Despite the recent increase in the number of boreholes and shallow wells, natural springs remain very important to the pastoralists. It was observed that during the dry season, livestock are moved close to the springs, which have lead to range deterioration around such springs as result of over-use.

3.5 Resource use conflict

The persistence of resource use conflicts in the northwestern rangelands indicates that land-use policies and institutions in Kenya are failing to address the sustainable utilization of land and its resources. It has been observed that Kenya has not had a single and clearly defined National Land Policy since independence (GoK 2007). This, together with the existence of many land laws and failure of the Land Act to clearly define property rights in pastoral areas has resulted in a complex land management and administration system. This has manifested itself in many ways such as fragmentation, breakdown in land administration, disparities in resources ownership and poverty. This not only has resulted in ecological, social, economic and political problems but also deterioration in land quality, under or over-utilization, tenure insecurity and resource use conflicts in arid and semi-arid regions.

Resource use conflicts amongst the various land users and stakeholders in northwestern Kenya are on the increase prompting need for proactive conflict resolution mechanisms. Resource use planning offers a platform for a collective responsibility of all the stakeholders and land users, including especially, the local communities in the area. Land-use competition and resource use conflicts can be minimized when restrictions agreed upon by all parties are enforced and observed by the local institutions of governance. Where rangeland resource is accessed by more than one community, resource use conflicts are often a common feature as resources becomes scarce and competing uses increase. This was observed to be the case in the region, where Turkana and Pokot have had decades of resource use conflicts. This implies that resource tenure and ownership rights in the area that restricts mobility and limits resources use access will undermine system stability and sustainable livestock production in the whole region. However, the problem of competition over the common resources in northwestern rangelands is an indication that its future development cannot continue to be decided by a *laissez faire* approach in which contemporary uncoordinated and often incompatible processes are permitted to find their own resolution. Hitherto, the lack of an integrated resource use and grazing plans has made it possible for various agencies to adopt and implement policies and strategies for development in these regions without consideration of resource use policies. Resource use plans at local level can then be backed by an effective policy framework to specifically deal with resource use conflicts in the arid and semi arid regions.

Recognizing legality of land and resources ownership status, when considering the appropriate interventions to end the resource use conflicts is imperative. Here, one must look at the northwestern rangelands as a unit rather than as separate entities following political boundaries, or belonging to different ethnic groups. Thus, the key to successful herding in the rangelands is to find a grazing system, which allows both the Pokot and Turkana communities to share common fields with available forage and water. Deliberate involvement and inclusion of the relevant stakeholders in the conflict resolution is part of the solution itself.

3.6 Emerging issues on resource use planning in arid and semiarid areas

Participatory selection of the planning committee was seen as a key step to a successful resource use planning in arid regions. Involving the locals in the selection of the planning committee fosters ownership, contributes in building community cohesion, ensure equity and somewhat guarantee sustainability. However, it was learnt that there is a tendency for the local administrations to interfere with the selection of the planning committee. During the planning process, livestock herders were identified as one of the lead stakeholders in the use and demarcation of land and its resources in northwestern rangelands. The local authorities, administration officials as well as local political leaders were also identified as stakeholders in the resource use planning. Emerging stakeholders were found to include the country council and, Government ministries such as Ministry of Lands and the Ministry of Development of Northern Kenya and other Arid Lands.

Building the capacity of the resource planning committees is a prerequisite in any successful planning process. FAO (1993) emphasized trainings in reinforcing traditional grazing practices among communities in arid and semi-arid regions. During this study, Turkana and Pokot pastoralists shared their well defined resource use plans especially on traditional livestock grazing pattern and how they guided utilization of water and pasture resources. According to authors' observations, the trainings assisted the local people to become more effective planners and handlers of resource use conflicts. In drafting the resource use plan, it was learnt that planning is a process rather than an event, and therefore do not take a day but a stipulated period depending on issue at play and must be flexible. For effectiveness, consensus building between the planning committees and all other stakeholders was found to be inevitable. It was thus, concluded that multi-stakeholder participation, collaboration and consensus building between the planning committee and key players is indispensable.

Interviews with community leaders in all the villages targeted by DMI project indicated that all land and other natural resources related decisions are undertaken by the community leaders together with local public and informal authorities. The approach to implement the resource use plan developed was thus, going to be the mandate of the community leaders together with the local authorities. However, it was recommended that range resource planning be carried out with a regional focus rather than strictly district (denoting specific administrative spatial coverage) context because pastoral and livestock grazing resources as well as systems traverse cross such district boundaries. Monitoring and evaluation would involve regular inter-community meetings and joint-visits to the dry season grazing and water points.

3.7 Constraints to resource use planning

A number constraints emerged from the planning exercise. They ranged from environmental, legal and institutional through socio-economic constraints. Environmental constrains identified during the planning included persistent and recurrent drought; inaccessible pasture grounds due to insecurity, livestock diseases and outbreaks such as *PPR*, *ECF*, *CCPP*, *CBPP*; water scarcity; invasion by unpalatable plant species (e.g. *prosopis*, *cactus*) in northwestern

rangelands; increased land degradation due to charcoal burning and overgrazing; degradation of pastures by ants and termites; wild fires, and; soil erosion among others. Legal and institutional constrains comprised of poor law enforcement leading to insecurity; lack of clearly defined land use policy for communal grazing areas; inadequate land use policies and legislation, and; lack of proper linkage between traditional institutions and the central government administrative and policy guidelines.

The socio-economic constrains in resource use planning in arid regions were identified to include expanding number of private enclosures in Pokot and Turkana districts; land subdivision and fragmentation leading to reduced pastoral mobility; long distances to watering points; proliferation of illegal small and automatic fire arms and insecurity; unplanned irrigation infrastructures; high illiteracy level in the pastoral areas; burgeoning human population and encroachment of pastureland by human settlements; lack of technical knowledge in land use planning in the target community; unsustainable rain-fed crop production along the rivers, and; lack of strong local institutional governance structures to oversee the resource use plan implementation. The resource use planning was itself identified as a solution to a number of these constraints.

4 Conclusion

Development of an integrated resource use plan in northwestern Kenya is essential in minimizing some of the major land-use competition and resource conflicts taking place in these rangelands. It provides a complementary management tool which will enhance coordinated and integrated planning between the various stakeholders and agencies working in the region. Key stakeholders, ranging from communities and their governance structures, to the relevant government departments and ministries should show a clear commitment to the implementation of the resource use plans. If well implemented, the resource use plans greatly cushion the pastoral communities against recurrent droughts that are getting worse and longer due to climate change phenomenon.

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