Pastoralism as a Conservation Strategy and Contributing Towards Livelihood Security and Improvement

Somalia Country Report

August 2006

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1. Executive Summary

Somalia, by her physical, human, institutional, and resource strength, is a livestock-producing country. Only 12% of the land, or 8 million hectares, is considered suitable for cultivation. In almost every other country in the world, nomadic pastoralists are a small and economically unimportant minority, but in Somalia they are nearly two-thirds of the population and about two-thirds of the country's exports originate from this sector.

The ecology of nomadic pastoralism is an adaptation to an environment in which the availability of water and grass are critical factors. Pastoralists possess a way of life that differs significantly from sedentary agriculturalists and could be defined as people who raise livestock for consumption trade and social exchange. Pastoralism is based on natural resource management that respects the limitations imposed on their environment, the necessity for mobility, and which integrates the local knowledge and institutional systems of pastoralists.

Somali herdsmen have evolved a system of nomadic rotation that is in harmony with their environment. Pastoralists traditionally possess a sound knowledge of their environment and ecology. Their basic education has been gathered from immediate experience arising out of conditions and realities that force them to move from pasture to pasture and water for themselves and for their animals. Climate is the primary factor in much of Somali life. For the large nomadic population, the timing and amount of rainfall are crucial determinants of the adequacy of grazing and the prospects of relative prosperity.

Rangelands in Somalia are characterised by a diverse floristic mosaic. Patches of grasslands and pure shrub thickets mixed with open canopy savannas and wooded Acacia steppes. To draw maxim benefit, pastoralist adapted to this environmental diversity by having a herd of mixed species. Cattle and sheep which rely mainly on grass while camels and goats mainly rely on browse. In addition, grazing lands are controlled by clans and the limits of clan territories are not clearly defined and subject to change over time. Members of a clan have primary rights to graze in the area of their clan. It is also possible to graze livestock in the territory of another clan subject to agreement. Pastoralists have also developed risk mitigation strategies that support sustainable use of their environments.

With the development over the last three decades of permanent water in the form of dams, Berkeds, and the construction of enclosures and the related adoption of farming practices, grazing patterns have shifted drastically. There are today forms of land use that are proving to be incompatible with pastoralism in Somalia. Pastoralist communities are

affected by numerous environmental problems. Deforestation, related to charcoal production, farming and fencing, which contributes to soil erosion. Water induced erosion is prevalent in the plateaux and valleys, while the impact of wind erosion is more evident in the coastal areas. Such activities contribute to the prevalence of recurrent drought and the shortage of rainfall.

Pastoralist communities in Somalia are integrated into the national economy as their livestock production serves a commercial purpose. However, traditional structures of authority have changed over time and the nomadic populations have little representation in decision-making structures outside of their own communities. In the eyes of the State, pastoralists often represent a minority vote, occupy vast areas of relatively invaluable land, and produce livestock products inefficiently. It is thus not surprising that pastoralists and their interests were not very high on national policy agendas when there was a Somali government.

Good governance reduces livelihood vulnerability in many ways – notably, by maintaining peace and security, promoting trade and economic activity, and providing effective social protection or safety nets. The collapse of the central government in 1991 created different conditions within Somalia. Both the Northwest and the Northeast Zone experienced relative stability over the last decade, which has allowed pastoralist communities to re-establish themselves. However, pastoralists in the rest of the country have suffered from continued insecurity and instability.

In the absence of a government, many traditional forms of natural resource management and control systems have been abandoned or are now ignored. In several instances, this has resulted in clearly unsustainable exploitation, a trend which may prove difficult to reverse.

2. Introduction to study and country

Somalia – the country

Somalia is located in the north-eastern part of the African continent, generally known as the "Horn of Africa". It has a border with Kenya to the south-west, Ethiopia and the republic of Djibouti to the west, and to the north and the east the red sea and Indian ocean respectively. It has an area of 637,000 square Km and a coastline that extends from Zeila to Cape Guardafui along the red sea and Ras Kiamboni along the Indian ocean. The equator passes through zunguni, a small village between Kismayo and Jamame in the Lower Juba region **(Fig 1).** The terrain consists mainly of plateaus, plains, and highlands. In the far north, however, the rugged east-west ranges of the Karkaar Mountains lie at varying distances from the Gulf of Aden coast. The weather is hot throughout the year, except at the higher elevations in the north. Rainfall is sparse, and most of Somalia has a semiarid-to- arid environment suitable only for the nomadic pastoralism practiced by well over half of the population. Only in limited areas of moderate rainfall in the northwest, and particularly in the southwest, where the country's two perennial rivers are found, is agriculture practiced to any extent.

Climate is the primary factor in much of Somali life. For the large nomadic population, the timing and amount of rainfall are crucial determinants of the adequacy of grazing and the prospects of relative prosperity. Somalis recognize four seasons, two rainy (*gu* and *dayr*) and two dry (*jiilaal* and *hagaa*). The *gu* rains begin in April and last until June, producing a fresh supply of pasture and for a brief period turning the desert into a flowering garden. Lush vegetation covers most of the land, especially the central grazing plateau where grass grows tall. Milk and meat abound, water is plentiful, and animals do not require much care. The gu season is followed by the *hagaa* drought (July-September) and the hagaa by the dayr rains (October-November). Next is *jiilaal* (December-March), the harshest season for pastoralists and their herds.

Most of the country receives less than 500 millimeters of rain annually, and a large area encompassing the northeast and much of northern Somalia receives as little as 50 to 150 millimeters. Certain higher areas in the north, however, record more than 500 millimeters a year, as do some coastal sites. The southwest receives 330 to 500 millimeters. Generally, rainfall takes the form of showers or localized torrential rains and is extremely variable. Mean daily maximum temperatures throughout the country range from 30 °C to 40 °C, except at higher elevations and along

the Indian Ocean coast. Mean daily minimum temperatures vary from 20 °C to more than 30 °C.

Fig 1. General map of Somalia

Northern Somalia experiences the greatest temperature extremes, with readings ranging from below freezing in the highlands in December to more than 45 °C in July in the coastal plain skirting the Gulf of Aden. The north's relative humidity ranges from about 40 percent in mid afternoon to 85 percent at night, varying somewhat with the season. During the colder months, December to February, visibility at higher elevations is often restricted by fog. Temperatures in the south are less extreme, ranging from about 20 °C to 40 °C. The hottest months are February through April. Coastal readings are usually five to ten degrees cooler than those inland. The coastal zone's relative humidity usually remains about 70 percent even during the dry seasons.

The political environment

Somalia experienced only nine years of multi-party democracy after two colonial territories, British Somaliland and Italian Somalia, peacefully united to form the Republic of Somalia in 1960 and before the 1969 coup d'état by Siad Barre. In its first decade, Siad Barre's government aligned itself with the Soviet bloc and followed a socialist economic planning model that proved unsuccessful at generating economic growth and sustainable development. The following decade, Siad Barre's government was characterised corruption, mounting domestic dissatisfaction, rebellious movements ending in the complete collapse of the state.

Somalia has been without a functioning central government since January 1991, when the military regime collapsed and civil war among clan militias broke out. During the subsequent decade, de facto decentralisation of political power largely along clan lines has occurred, with varying degrees of territorial control achieved by militia leaders and local administrations in different areas of the country.

The international community mounted an unprecedented humanitarian and military operation (first led by the United States and then by the UN) but failed to end factional fighting or engender a process of national reconciliation. Following the failed peacemaking attempts by U.S. and UN missions in the early 1990s, a low-intensity state of conflict and anarchy has persisted to this date in southern and central Somalia, with only small pockets having in recent years established localised and weak forms of governance. The northern regions in Somaliland and Puntland, instead, managed for a longer timeframe and with considerable success to limit internal and external violent confrontations, establish functioning political and administrative organs of governance, and ensure relative personal security.

Pastoral Democracy

Clan identity is a central organising force in Somali society and is more significant in contemporary stateless Somalia than in previous decades (UNDP 1998). In the period of state collapse, clannism has proved to be both divisive and a destructive tool in the hands of political leaders as well as a vital source of group protection, social security and customary law in the absence of the state. Clan identity in Somalia is very fluid. Each Somali can trace their genealogy over 30 generations, giving Somalis membership in many sub-clans. Which level in one's lineage is mobilized as one's 'clan' depends entirely on the issue at hand.

The council of clan elders, for example, is the dominant institution in most locales expected to provide wisdom and build consensus among clan ranks in matters of clan interest especially in times of crisis. In Somali society all married men can claim to be elders and speak in clan assemblies (shir) earning Somalia a reputation as a 'pastoral democracy'. Elders' councils are not institutionalised and often they react more than they act.

Pastoralism in Somalia

He who has goats has a garment full of corn;
A milk-cow is a temporary vanity;
A he-camel is the muscle that sustains life;
A she-camel—whoever may have her—is the mother of men.
(Sayid Mahammad Abdile Hasan - Poet and Somali leader)

Somalia, by her physical, human, institutional, and resource strength, is a livestock-producing country. Only 12% of the land, or 8 million hectares, is considered suitable for cultivation. In almost every other country in the world, nomadic pastoralists are a small and economically unimportant minority, but in Somalia they are nearly two-thirds of the population and about two-thirds of the country's exports originate from this sector. Pastoralists could be defined as people who raise livestock for consumption trade and social exchange.

Pastoralism is based on natural resource management that respects the limitations imposed on their environment, the necessity for mobility, and which integrates the local knowledge and institutional systems of pastoralists. The over-arching influence for any pastoralist activity is the nature, security and complexity of people's livelihood strategies. Raising livestock on marginal lands through seasonal migration is a uniquely

efficient way to draw the maximum well-being out of areas such as drylands, which are unsuitable for other forms of agriculture.

Despite decades of empirical research providing evidence of the value and resilience of the pastoral livelihood, many policy makers, government staff, and NGO personnel continue to view pastoralism as a backward, environmentally destructive and unsustainable production system. Pastoralism, as a potentially sustainable form of land use and conservation in harsh and arid climates, is poorly and often misunderstood at national planning and economic levels.

Research and studies that have been undertaken rarely find expression in a policy context and rarely influence dryland policy and planning. This study aims to demonstrate the importance of pastoralism as a conservation strategy for the drylands in Somalia. The study will review existing published and "grey" literature with respect to pastoralism as a natural resource management strategy in Somalia. It will assess the extent to which pastoralism as conservation strategy is or can be compatible with other forms of land use.

Limitation of the Study

The timeframe for this study was 15 days. Due to this time constraints, no field data was collected. In addition, while East African Pastoralism was widely researched and studied, published material about Somali Pastoralism was not easily available. As a consequence, a comprehensive literature review of Somali pastoralist systems was not possible. The study however, will show pastoralist systems in Somalia as natural resource management strategy supportive of nature conservation.

The following chapter will discuss in detail the land, its ecosystems and vegetation types including different forms of land use practiced in Somalia. Pastoralist natural resource management strategies will be presented in the following chapter discussing specific pastoralist knowledges. This will be followed by a discussion about pastoralist's institutions for managing their natural resources. How risk mitigation and resilience enhancing strategies practiced by Somali pastoralists is supporting sustainable land use will be the subject for the following chapter. Before drawing conclusions, compatibility of pastoralism with other forms of land use will be evaluated.

3. The pastoralist lands – ecosystems and vegetation types, forms of land use

Physiographically, Somalia is a land of limited contrast. In the north, a maritime plain parallels the Gulf of Aden coast, varying in width from roughly twelve kilometres in the west to as little as two kilometres in the east. Scrub-covered, semiarid, and generally drab, this plain, known as the Guban (scrub land), is crossed by broad, shallow watercourses that are beds of dry sand except in the rainy seasons. When the rains arrive, the vegetation, which is a combination of low bushes and grass clumps, is quickly renewed, and for a time the guban provides some grazing for nomad livestock.

Inland from the gulf coast, the plain rises to the precipitous northward-facing cliffs of the dissected highlands **(Fig 2)**. These form the rugged Karkaar mountain ranges that extend from the northwestern border with Ethiopia eastward to the tip of the Horn of Africa, where they end in sheer cliffs at Caseyr. The general elevation along the crest of these mountains averages about 1,800 meters above sea level south of the port town of Berbera, and eastward from that area it continues at 1,800 to 2,100 meters almost to Caseyr. The country's highest point, Shimber Berris, which rises to 2,407 meters, is located near the town of Erigavo. Southward the mountains descend, often in scarped ledges, to an elevated plateau devoid of perennial rivers. This region of broken mountain terrain, shallow plateau valleys, and usually dry watercourses is known to the Somalis as the Ogo.

In the Ogo's especially arid eastern part, the plateau—broken by several isolated mountain ranges—gradually slopes toward the Indian Ocean and in central Somalia constitutes to Mudug Plains. A major feature of this eastern section is the long and broad Nugaal Valley, with its extensive network of intermittent seasonal watercourses. The eastern area's population consists mainly of pastoral nomads. In a zone of low and erratic rainfall.

The western part of the Ogo plateau region is crossed by numerous shallow valleys and dry watercourses. Annual rainfall is greater than in the east, and there are flat areas of arable land that provide a home for dryland cultivators. Most important, the western area has permanent wells to which the predominantly nomadic population returns during the dry seasons. The western plateau slopes gently southward and merges imperceptibly into an area known as the Haud, a broad, undulating terrain that constitutes some of the best grazing lands for Somali nomads, despite the lack of appreciable rainfall more than half the year. Enhancing the value of the Haud are the natural depressions that during

periods of rain become temporary lakes and ponds. The Haud zone continues for more than sixty kilometers into Ethiopia, and the vast Somali Plateau, which lies between the northern Somali mountains and the highlands of southeast Ethiopia, extends south and eastward through Ethiopia into central and southwest Somalia.

Southwestern Somalia is dominated by the country's only two permanent rivers, the Jubba and the Shabele **(Fig 1)**. With their sources in the Ethiopian highlands, these rivers flow in a generally southerly direction, cutting wide valleys in the Somali Plateau as it descends toward the sea; the plateau's elevation falls off rapidly in this area. The adjacent coastal zone, which includes the lower reaches of the rivers and extends from the Mudug Plain to the Kenyan border, averages 180 meters above sea level.

The Jubba River enters the Indian Ocean at Kismaayo. Although the Shabeelle River at one time apparently also reached the sea near Merca, its course is thought to have changed in prehistoric times. The Shabeelle now turns southwestward near Balcad (about thirty kilometers north of Mogadishu) and parallels the coast for more than eighty-five kilometers. The river is perennial only to a point southwest of Mogadishu; thereafter it consists of swampy areas and dry reaches and is finally lost in the sand east of Jilib, not far from the Jubba River. During the flood seasons, the Shabeelle River may fill its bed to a point near Jilib and occasionally may even break through to the Jubba River farther south. Favourable rainfall and soil conditions make the entire riverine region a fertile agricultural area and the center of the country's largest sedentary population.

The Somali Traditional ecological classification system, deegaan

The Somali nomads have an extended knowledge of plant-animal-fundamentals (Barkhadle, 1993). Most plants and animals have a local name and their phenology, distribution and ecological zones are known. The use of virtually every plant within the grazing zone, *deegaan,* which might range from 200 km2 to 2,000 km2 – is known. Under the traditional system of ecological classification, 16 categories are recognized, as follows (Barkhadle, 1993):

Box 1. The Somali Traditional ecological classification system, *deegaan*

Guban – "burnt area" in Somalia language – land (Dhulka Guban)

Buraha – mountain – land (Dhulka Buuraleyo)

Howd – bush or thicket – land (Dhulka Howd)

Daror – large plain – land (Dhulka Dharoor)

Sool – a highland area – land (Dhulka Sool)

Nugal – a specific valley – land (Dhulka Nugaal)

Mudug – much of central Somalia – land (Dhulka Mudug)

Iid – named after the yicib plant – land (Dhulka Ciid)

Deh – without high shrubs or trees – land (Dhulka Deexda)

Doboy – clay – land (Dhulka Dhobooy)

Bakol – an area where Commiphora trees dominate – land (Dhulka Bakool)

Gedo – land only suitable for animal (especially camel) grazing) – land (Dhulka Gedo)

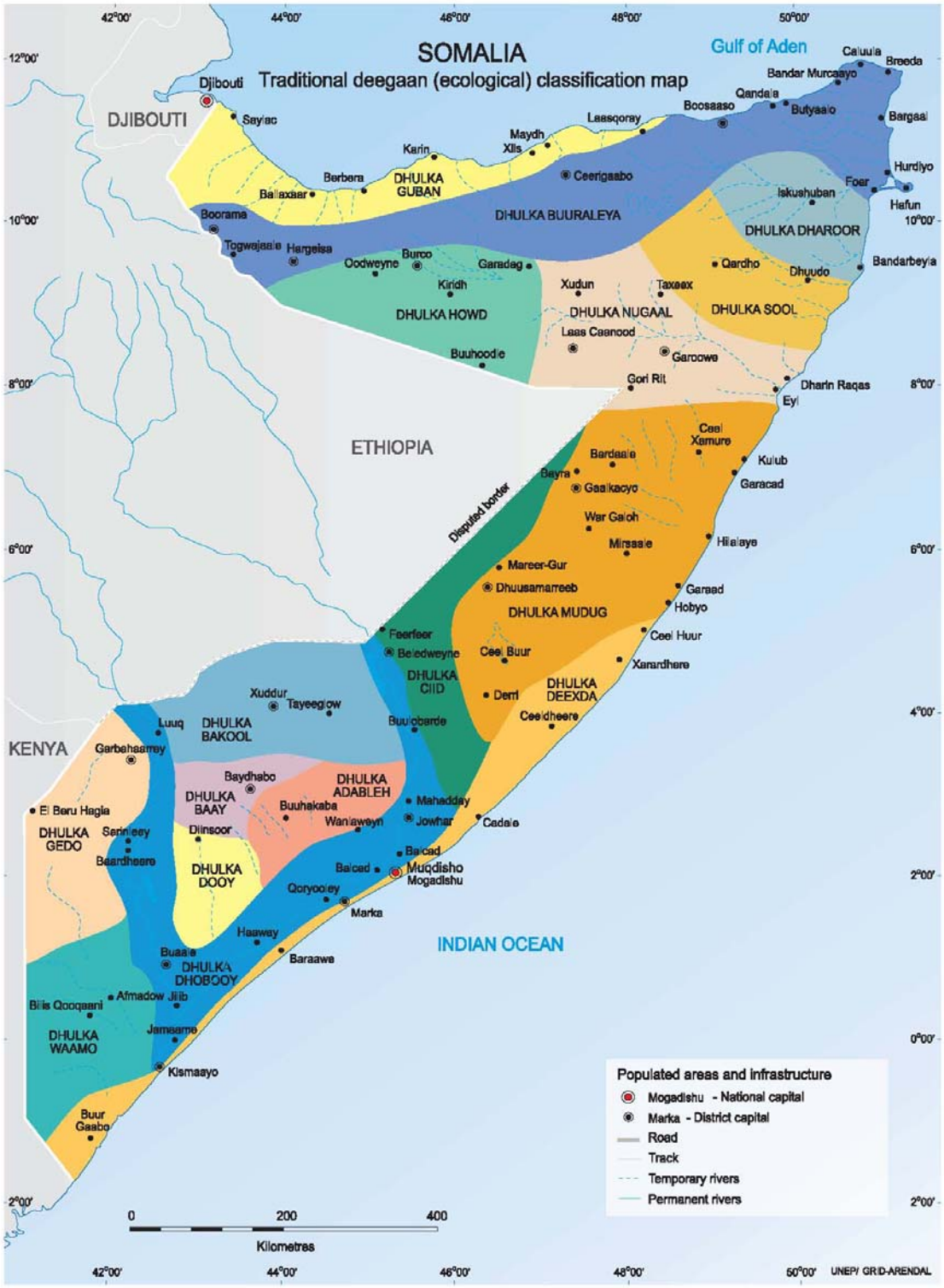
Bay – the area which receives the highest rainfall – land (Dhulka Baay)

Adable –flat area with small mountains – land (Dhulka Adableh)

Doy – between the two banks of the Jubba and Shabeelle rivers – land (Dhulka Dooy)

Wamo – land lying between Badhaadhe and Kismayo and from Kismayo to the Kenyan border – land (Dhulka Waamo)

Fig 2. The Somali Traditional ecological classification system, *deegaan*



Vegetation Types

In most of northern, northeastern, and north-central Somalia, where rainfall is low, the vegetation consists of scattered low trees, including various acacias, and widely scattered patches of grass. This vegetation gives way to a combination of low bushes and grass clumps in the highly arid areas of the northeast and along the Gulf of Aden.

As elevations and rainfall increase in the maritime ranges of the north, the vegetation becomes denser. Aloes are common, and on the higher plateau areas of the Ogo are woodlands. At a few places above 1,500 meters, the remnants of juniper forests (protected by the state) and areas of candelabra euphorbia (a chandelier-type spiny plant) occur. In the more arid highlands of the northeast, *Boswellia* and *Commiphora* trees are sources, respectively, of the frankincense and myrrh for which Somalia has been known since ancient times.

A broad plateau encompassing the northern city of Hargeysa, which receives comparatively heavy rainfall, is covered naturally by woodland and in places by extensive grasslands. Parts of this area have been under cultivation since the 1930s, producing sorghum and maize; in the 1990s it constituted the only significant region of sedentary cultivation outside southwestern Somalia.

The Haud south of Hargeysa is covered mostly by a semiarid woodland of scattered trees, mainly acacias, underlain by grasses that include species especially favored by livestock as forage. As the Haud merges into the Mudug Plain in central Somalia, the aridity increases and the vegetation takes on a subdesert character. Farther southward the terrain gradually changes to semiarid woodlands and grasslands as the annual precipitation increases.

The region encompassing the Shabeelle and Jubba rivers is relatively well watered and constitutes the country's most arable zone. The lowland between the rivers supports rich pasturage. It features arid to subarid savanna, open woodland, and thickets that include frequently abundant underlying grasses. There are areas of grassland, and in the far southwest, near the Kenyan border, some dry evergreen forests are found.

Along the Indian Ocean from Mereeg, about 150 kilometers northeast of Mogadishu, southwestward to near Kismaayo lies a stretch of coastal sand dunes. This area is covered with scattered scrub and grass clumps where rainfall is sufficient. Overgrazing, particularly in the area between Mogadishu and Kismaayo, has resulted in the destruction of the protective vegetation cover and the gradual movement of the once-

stationary dunes inland. Beginning in the early 1970s, efforts were made to stabilize these dunes by replanting.

Other vegetation includes plants and grasses found in the swamps into which the Shabeelle River empties most of the year and in other large swamps in the course of the lower Jubba River. Mangrove forests are found at points along the coast, particularly from Kismaayo to near the Kenyan border. Uncontrolled exploitation appears to have caused some damage to forests in that area. Other mangrove forests are located near Mogadishu and at a number of places along the northeastern and northern coasts.

4. Pastoralist natural resource management strategies – general and species specific

Somali herdsmen have evolved a system of nomadic rotation that is in harmony with their environment. These pastoralists have an appreciation for livestock developed through centuries of close association with the animals living in the desert. In fact, both the livestock and the livestock owner have become part of the range ecology. Their system of range use fits in very well with both the needs of range vegetation and the needs of the animal. Pastoralists use natural resource and land management strategies which are conservation supportive. This chapter will present a number of these strategies.

Deferred rotation management

Moving livestock to seasonal pastures is a strategy regularly used to convert crop residues, and grasses and herbs from areas where crops are not grown, into human food. Livestock husbandry and mobility are frequently associated because the livestock must be fed regularly through the year, but in areas of marked seasonality, like Somalia, plant growth is often discontinuous, occurring only when temperature and rainfall allow. In addition, production, harvest, and storage of fodder are normally not an available option in Somalia. Therefore, migration to exploit seasonal pastures represents the best strategy for maintaining a regular supply of food for livestock.

In the yearly cycle, most clans have a fairly regular movement over the range. In the dry season, they are concentrated near their home wells over which they have primary rights. Where water is abundant and relations friendly they share with lineages of other clans. During these dry seasons, the lineage groups are normally at their thickest concentration and the ranges near permanent water are mostly stocked **(Fig 3)**

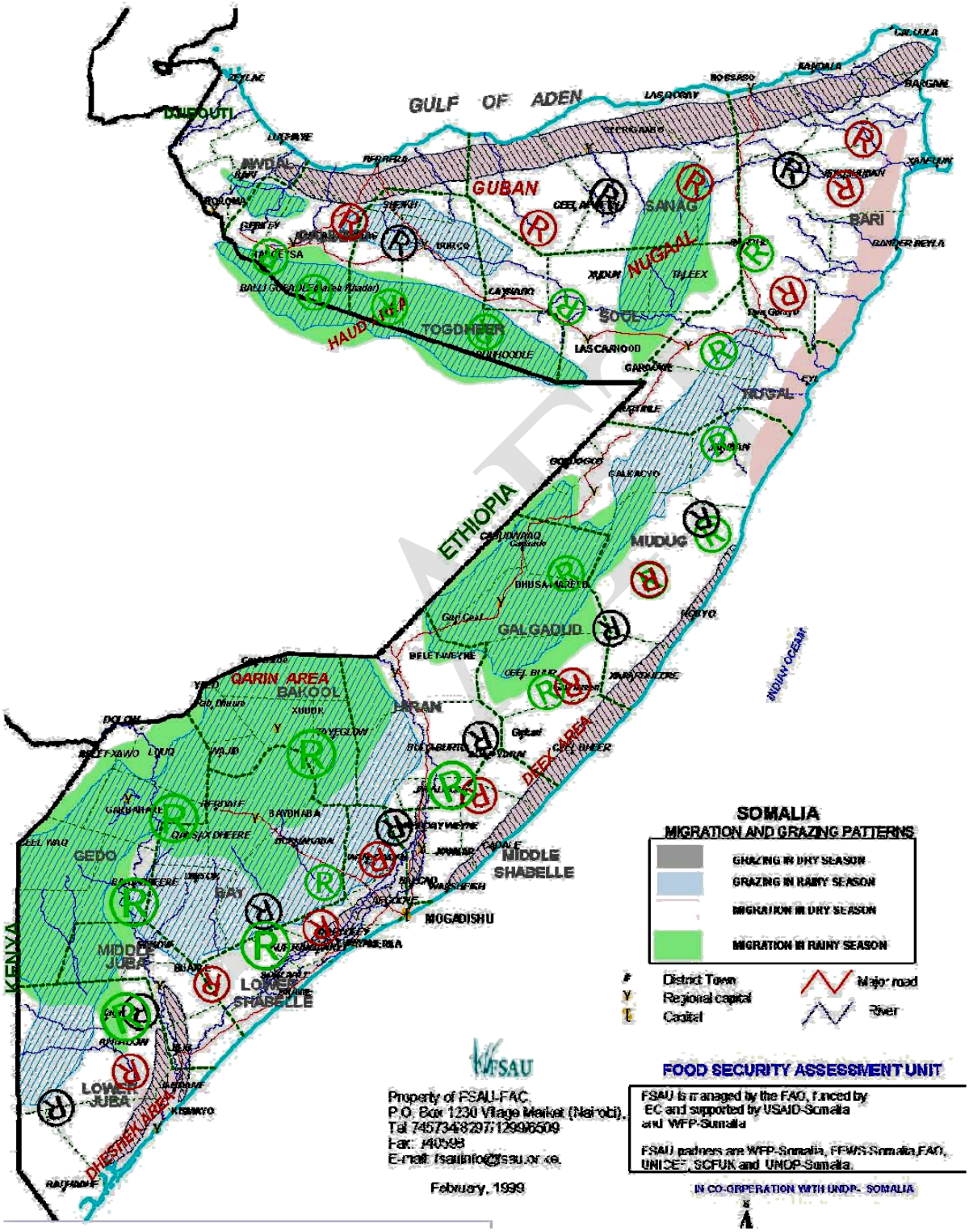
In the wet season the herds leave their home wells and scatter out over the range where water is only temporarily available. This practice gives a rest to those areas nearer to water sources, and in effect provides a system of deferred rotation management. The plants of the range have evolved under such a system of seasonal deferment throughout the year, and range condition declined rapidly when subjected to year-long grazing.

Herders also divide their grazing habitat into four micro-categories based on plant cover and soil type:

- *Harqaan/gabiib*—thick bush, clay soil
- *Adable/dhoobey*—thick bush, black soil (agricultural)
- *Dooy*—open bush, red soil with good water conservation
- *Bay*—open bush, mixed grey and red soil

For Somali pastoralists, the rainy season plays the decisive role in their management decisions. They have developed an elaborate subdivision of the seasons, related to the rotational use of the browsing areas. This system of migration is in harmony with the harsh environmental conditions and unreliable rainfall.

Fig 3. Migration and grazing patterns



Herd splitting

Another natural resource management strategy employed by Somali pastoralists is herd splitting into home-based herds (usually lactating) and nomadic herds (mostly dry). Home-based herds are kept close to settlements with possible deficiency in forage supply, whereas nomadic herds utilise better distant pastures. This results in increased niche specialisation, in reduced competition among livestock for the same vegetation and in a dispersion of grazing pressure as each type of livestock is taken to the pasture which suits it best. The strategy appears to be a desirable and realistic attempt to utilise range resources more evenly while maintaining the productivity of the animals. Herd splitting is a technique that can be used to maintain the long term productivity of the range, to ensure sustainable production at a comparatively low cost, and in some cases to improve degraded rangelands.

Selection of foraging area

Many factors are considered by pastoralists when deciding and selecting foraging areas. These includes, total annual rainfall, its spatial and temporal distribution, the effective rains after dry seasons and their variation, tick infestation and outbreak of flies. Knowledge of plant species commonly selected by foraging at different times of the year is also fundamental to effective grazing and browsing management. Herders learn these aspects at a young age. Some of the knowledge is passed on orally. Some of it is contained in songs, poems and proverbs. Much of it is gained from watching for years.

Livestock are moved where better forage is available. This movement is pre-planned with few men sent to survey areas which are expected to have better forage. They spend days or even weeks in their surveillance. If better places are found, they mark by cutting bushes where camps will be. These marks are respected by all clans unless hostility exists among them. Selected sites are usually old settlements which are re-used. The scouts return home with the information, and after a day or two, camps move together to the new location. If no better place is found, however, people stay in the same area but camp sites are frequently moved between old camping areas. Pastoralists seldom camp in a new place. Each day, animals are herded to different locations where evergreen species are available or where the vegetation stays green in the dry season.

In-depth pastoral knowledge of complex rangeland agro-ecological dynamics is critical in detecting resource availability to ensure livelihood strategies and coping mechanisms accordingly. This knowledge includes

understanding erratic climatic patterns and familiarity with patchy range resources. Water availability is often the limiting factor in pasture utilisation, whilst wild fruits and nuts, medicinal plants, and salty areas provide important supplemental food resources for pastoralists. Pastoralists also have a well developed local knowledge about differences in forages they require for their herds. They identify browse and grass species most favoured by their livestock **(see Tables 1&2)**

Table 1. Ten most palatable grass species

Name of Plant (Somali)	**Name of Plant (Botanical)**
Dareemo	*Plumulosis sp*
Majeen	*Killeri sp*
Badhooli	*Tenellus sp*
Balxoore	*Hirtigluma sp*
Jabioke	*Cenchroides sp*
Garogaro	*n/k*
Saddexo	*Detyleclium aegyptium*
Duur	*n/k*
Badhiweyne	*Rupestaris sp*
Daris	*n/k*

Table 2. Ten most palatable browse

Name of Plant (Somali)	**Name of Plant (Botanical)**
Bilicil	*Acacia milifera*
Gahayd	*Fruticosus sp*
Hohob	*Grewia bencilities*
Dhuyac	*Commipheroides sp*
Maded	*Cordia monoica*
Dhafarur	*Grewia tenax*
Himir	*Grewia indigofera*
Jilab	*Atripicifolia sp*
Jadeer	n/k
Yucub	*Angustifolia sp*

Watering

Lack of water is generally a limiting factor to pasture utilisation in pastoral areas. The challenge associated with water scarcity is also compounded by high ambient temperatures and high solar radiation in pastoral areas. Additionally, watering interval determines the foraging radius around water sources. Thus, watering management is closely related to grazing management. Constant movement of livestock from

one place to another in search of green forage minimises the need for surface water.

During wet seasons, pastoralists aim to conserve the consumption of water. The amounts of water consumed by animals depend on forage availability and its moisture content. Animals are kept where the distance to water is not usually more than two days' camel walk. In the dry season, pastoralists divide watering into three sessions to cope with availability.

Early dry season watering is when shrubs and trees shed leaves, herbaceous species become dry, and the majority of green forage disappears. Signs of thirst become obvious in most camels. The interval between watering is long; and the amount of water consumed specifically by camels is less than during the following two sessions. Middle dry season watering is when camels hunt for much reduced green forage and the few evergreen plants. Deciduous shrubs and trees bear no significant amount of edible forage, availability of dry matter is greatly reduced and the animal hardly obtains sufficient forage intake for survival. The interval of watering is, on average, about 13 days. The amount of water camels drink is greater than the first session. Late dry season watering is carried out when camels adapt themselves to the available dry forage and start losing weight especially milking camels. Camels are watered in a regular manner. They consume the largest quantity of water compared to the other two seasons. The interval of watering, however, is the same as the second session, about 13 days.

5. Pastoralists institutions for managing their natural resources

Somali rangelands are characterised by a diverse floristic mosaic. Patches of grasslands and pure shrub thickets mixed with open canopy savannas and wooded Acacia steppes. To draw maxim benefit, pastoralist adapted to this environmental diversity by having a herd of mixed species. Cattle and sheep which rely mainly on grass while camels and goats mainly rely on browse. In addition, grazing lands are controlled by clans and the limits of clan territories are not clearly defined and subject to change over time. Members of a clan have primary rights to graze in the area of their clan. It is also possible to graze livestock in the territory of another clan subject to agreement. These and other local institutions that guide the pastoralist livelihoods in Somalia will be discussed in the following section.

Tribal Institutions

Clan institutions play the role of governing the behaviour of individual member of the society. These institutions are organized to serve the social, economic, security and development needs of its members. They also have the responsibilities of decision-making and enforcement of resource use rules through political authority. There are traditional norms and values that pastoral communities depend on for smooth operations in arid and semi-arid ecological zones. In Somalia, each clan has its own traditional clan head such as Islam, *Ugaz*, *Sultan, Garaad, Iiman, Waber, Malaq,* etc. Most of the issues are dealt with at clan level. In Somali society, the ultimate authority and leadership is vested with the clan head. Below that figure, in the hierarchy of leadership, there is a council of elders constituting sub-clan representatives. The council meets only if there are critical issues concerning the clan. The sub-clan representatives are responsible for issues related to the daily lives of the community at village or sub-clan level.

Tenure and access system

Pastoral tenure systems - often defined as communal - involves social capital and negotiating capacities through the principles of flexibility and reciprocity. Pastoralists negotiate access to land and water with neighbouring herders and farmers. Reciprocal grazing occurs by request and there is every incentive to keep reciprocal grazing going, because rainfall is often patchy and generosity to a neighbour this year will ensure access for one's own livestock next year.

These factors play a critical role in ensuring access to different range resources in times of need, and provide for critical options of dispute resolution during periods of stress and other forms of shock. Accessing resources and services of neighbouring communities is therefore a vital element for pastoralists. The resource tenure system is flexible enough to provide necessary room for an array of negotiations and arrangements among different groups and levels, depending on needs and on resources availability.

Resource ownership

Water sources for pastoralists include wells, rivers, boreholes and cemented underground water reservoirs known as Berkeds. Use of wells is usually controlled by a clan with local clan elders solving conflicts regarding use. A well can also be owned by individuals where an individual has constructed it. In this case the individual has the right to control access or sell the water. Berkeds have become increasingly important as a water source in recent years, particularly in parts where permanent water is limited. These Berkeds are privately owned, and anybody who can afford to constructs their own in their clan territory. The owner has full control over the use of the water.

Livestock ownership starts at the birth of a child. Usually it is the father who gives his son a young or newly born female camel and other animals as the base of his future herd. The child also receives gifts from his close relatives (elder brothers, uncles, etc). As he grows, his herd also grows with him. At marriage, a portion of the family herd is allocated to him while it still remains with the family herd. At his father's death, the unallocated stock is shared out among heirs. While new cluster of family holdings emerge, animals usually continue to be herded together.

While animals are individually owned and inherited, this individual ownership, however, is not absolute because animals, especially camels, are always considered as clan property. Somali camelmen say "*Kin owners herd camels together but each herder pays particular attention to his individual camel*". This famous proverb clarifies the collective outlook of both individual and communal ownership of the herd. In time of adversity, the individual owner has no absolute right to give or refuse to dispose of his herd. The kin or clan members decide the distribution of animals to the victim from its members. The animals collectively given to the victim by kin or clan include lactating, pregnant and immature animals. On the other hand, the individual owner has the right to loan his animals to relatives and friends.

6. Managing for risk and enhancing resilience

Pastoralist communities developed a number of traditional coping mechanisms to reduce the hazards imposed by an unpredictable environment. These include income diversification and stocking of different animal species or breeds to survive in their risky environment, pastoralists also adopt production and risk management strategies including mobility and migration, asset accumulation and diversification of income and subsistence sources including migrant wage income. These range of risk reduction and risk absorption techniques employed by Somali pastoralists will be presented here.

Migration as risk avoidance

Exploitation of seasonal pastures is not the only reason that livestock herders move. The use of livestock as a major resource gives the Somali population dependent on herds the option of moving to avoid a wide range of hazards in the physical and social environments. This is an option not generally available to agricultural people who are tied to their agricultural lands and their stored agricultural products. Pastoralists may move with their herds to avoid insects and disease; to reduce competition with other groups; and to avoid authorities. In addition, pastoralists have also developed risk mitigation strategies that support sustainable use of their environments.

Risk pooling and reduction

It is popular at time of need within the Somali pastoralists to call on support from relatives, which is apparently available perhaps because of the range of traditional institutions of mutual support in Somali culture. There are mechanisms for redistributing food, cash (including remittances and *zakaat*), animals, and labour, either on a reciprocal basis or from wealthier to poorer households. These are vital mechanisms for pooling and reducing risk. Families also use a strategy of dividing themselves into different settlements – some members move to urban areas or attachment villages, while other members maintain nomadic or semi-nomadic lifestyles. Distributing family members in this way is a form of risk management which allows families to maintain mutually supportive relationships and is a survival strategy that has supported the viability of Somali pastoralism. Families also respond with rationing of food consumption as it is costless and easily reversible.

Diversification

Nomadic communities have developed coping mechanisms to supplement their income from different sources such as the sale of livestock, charcoal production, and increased selling of dairy products. In addition, some families have begun to produce *khat* (a green stimulant widely used in Somalia). Another major coping mechanism has been the increase in charcoal production. Families also pool their livestock together in order to market them. What they buy is then divided amongst them. This mechanism reduces costs incurred in transportation, holding pens, tax levy and other personal expenses while waiting their livestock to be sold.

7. Compatibility with other forms of land use

While there are violent interactions within and between migratory herding communities and the settled agriculturalists with whom they interact, there is also a wide range of cooperative and synergistic relationships between these groups. Mutually dependent, their survival and prosperity depend on each other. Pastoralists negotiate access to land and water with neighbouring herders and farmers, and sell their livestock into a lengthy marketing chain of traders and intermediaries. Farmers sell their produce to urban residents, who purchase various goods and services from pastoralists, farmers and traders. These are complex patterns of cooperation that was developed over the years.

However, there are also forms of land use that are proving to be incompatible with pastoralism in Somalia. Pastoralist communities are affected by numerous environmental problems. Deforestation, related to charcoal production, farming and fencing, which contributes to soil erosion. Water induced erosion is prevalent in the plateaux and valleys, while the impact of wind erosion is more evident in the coastal areas. Such activities contribute to the prevalence of recurrent drought and the shortage of rainfall. With the development over the last three decades of permanent water in the form of dams, Berkeds, and the construction of enclosures and the related adoption of farming practices, grazing patterns have shifted drastically. In the following section, these different land uses and how they impact on Pastoralism will be discussed.

Farming

In the south of Somalia there are areas where both pastoralism and farming are combined. Agro pastoralists live in fixed villages but send their animals out with the men twice a year to plateau grassland in the rainy season, and to river banks at the height of the dry season. Agropastoralists combine rain-fed cultivation of sorghum, maize and vegetables with the breeding of small stock, cattle and camels. The growing number of pastoralists and settled farmers who are diversifying into agropastoralism demonstrates the potential complementarity between herding and farming. Furthermore the scope for further collaboration is evident: inputs such as fodder, apart from simply crop residues, provide the possibility of greater diversification of herd management techniques.

Urbanisation

Pastoralists define urbanisation as the main ecological challenges facing their way of life. Increased urbanisation and increased demand for charcoal leads to greater tree deforestation. Encroachment of communal grazing areas by agriculture and private ranchers is an important factor contributing to environmental degradation. These are settlement projects that encourage excessive population densities and cultivation in zones better suited to extensive livestock system.

Charcoal mining

Charcoal production is a response to both the livestock ban as well as to droughts and prolonged dry seasons that have decreased animal stocks. However, charcoal production is a major contributor to further environmental degradation. The high demand for charcoal within towns of both Somalia and Ethiopia offers a lucrative income source for impoverished families. However, charcoal production not only removes trees, but due to the heat generated from the baking of the wood, also renders the land surrounding the baking area unable to support grass.

There has been a rapid expansion in the production of charcoal in recent years, with much of it being exported to meet demand in Saudi Arabia, Yemen and the United Arab Emirates, where local forests are more strictly protected. Charcoal may today represent one of Somalia's most valuable exports: a bag of charcoal in Somalia might fetch US$3-4, but the same bag could be sold for US$10 in the Gulf States (EDC News, 2001). This same trade, however, has also caused open conflict between clans in Somalia, involving shoot-outs and mine lying.

Range enclosures

Currently, there is a trend by both nomadic and rural communities to enclose land. This involves fencing of an area by an individual in order to conserve the pasture within for their livestock or for sale to other livestock owners. Such enclosures reduce area of land available for grazing and do not accommodate traditional mobility. Although some enclosures yield high production of fodder and the revival of land is apparent, other enclosures are unproductive and produce little fodder. Enclosures limit the movement of livestock and often times large areas are fenced side by side without consideration for mobility. This land use practice is not compatible with pastoralism because it limits animals to one area, it also creates conflict amongst communities. It is not uncommon for enclosure owners to still use communal land and reserve

their enclosure fodder for when the communal land has been exhausted. Some communities have denied owners of enclosures access to communal lands.

Proliferation of water points

A substantial increase in the number of surface water storage installations (*berkeds*), with settlements throughout the wet grazing areas, has disrupted the traditional migration routes for livestock. Permanent water points allow livestock to utilise rangelands continuously and this leads to environmental degradation. Consequently, the rangelands are overgrazed, with a reduction in plant vigour; a shift from palatable species to unpalatable ones such as *aleo spp*; water erosion; and degradation of soil conditions (soil water holding capacity). There has been considerable biodiversity degradation, with the loss of some wild habitats. In the absence of proper interventions to tackle the root causes, rangeland degradation has gradually increased over time and has led to a drop in the number of animals the range can support

8. The enabling policy for pastoralism

Nomadic communities in Somalia are integrated into the national economy as their livestock production serves a commercial purpose. Profits from livestock and livestock products are used to purchase imported household goods such as sugar, flour, and rice. However, traditional structures of authority have changed over time and the nomadic populations have little representation in decision-making structures outside of their own communities. In the eyes of the State, pastoralists often represent a minority vote, occupy vast areas of relatively invaluable land, and produce livestock products inefficiently. It is thus not surprising that pastoralists and their interests were not very high on national policy agendas.

During Siyaad Barre's regime pastoralists, and their associates clan systems, were considered to be a problem by the Government in Somalia. There was an official program to eradicate clans as the basis of social organisation among the Somalis, which was initiated by officially orchestrated public demonstrations. All rangeland was considered the property of the state, the nomads were allowed only user rights that were taken as a privilege granted by the state, while agricultural farms along the rivers and urban property was titled, privatised and individualised.

The 1973 Land Reform Act was formulated to give advantage to state enterprises and mechanized agricultural schemes. Arable land had to be leased from government; pastoralists no longer had claim to land they previously depended on (Gunn, 1990). Obtaining leases to land was cumbersome and beyond the scope of most small farmers. Large estates were established – often enclosed and guarded – and pastoralists charged a fee for access to, for example, water. A 1974 law on co-operative development, originally intended to promote the vegetative recovery of grazing lands, initially established 14 co-operatives 200-300 ha in size (Unruh, 1995). More ambitious range co-operatives followed in the late 1970s, with assistance from the Northern Rangelands Development Project, all of which were further to the detriment of smaller herd owners.

The transient rights to use resources that are so critical to nomadic pastoralism were ignored when the national land tenure regime – which favoured crop cultivation – was being developed (Unruh, 1995). Among the direct results of this action has been land degradation, resource use conflicts, a decline in pastoral production and impacts on Somali clan alliances, which in many cases serve to regulate rational natural resource access and use.

Although government policies in Somalia did recognise, the importance of the nomadic pastoral sector, and the need for special measures to bring development to it, however such recognition did not match in actual practice. Thus the fact that nearly two-thirds of the population of Somalia were nomadic pastoralists, that livestock and livestock products exports were responsible for about two-thirds of foreign exchange earnings and that taxes and levies on livestock exports were a major source of government income, but consistently the livestock, forestry and rage received very low allocation of the national budget. For example it has received 8.6% of development fund spent in 1971-1973, droping to 5.5% in the 1974-1978 plan and in the last annual development plan of the last government in 1990 the sector was allocated 7.4%. (calculated from development plans , ministry of Planning and coordination, Somali Democratic Republic).

Governance

Good governance reduces livelihood vulnerability in many ways – notably, by maintaining peace and security, promoting trade and economic activity, and providing effective social protection or safety nets. The collapse of the central government in 1991 created different conditions in each zone within Somalia. Both the Northwest and the Northeast Zone experienced relative stability over the last decade, which has allowed pastoralist communities to re-establish themselves. However, pastoralists in the rest of the country have suffered from continued insecurity and instability. In the absence of a government, many traditional forms of natural resource management and control systems have been abandoned or are now ignored. In several instances, this has resulted in clearly unsustainable exploitation, a trend which may prove difficult to reverse. For example, parts of the north-west, and the Kismayo area, are showing signs of environmental degradation as a result of overgrazing and the uncontrolled harvesting of trees for charcoal making (UNDP, 1998).

Over all, the prevailing governance structures in today's Somalia could be described as weak and ineffective. It is also not yet clear whether the ongoing nation building process will enable rural communities to articulate their priorities. Equally challenging is the re-establishment of land ownership, use, and access rights given the recent histories of the deterioration of Property rights in much of Somalia.

Conflict resolution

Conflict resolution is often characterised as “political”, but it has profound implications for livelihoods, in multiple ways. Conflict in pastoral areas poses challenges to development and poverty alleviation and has the potential for sporadic pastoral violence at local, national and regional levels. Many pastoral communities have a history of successful armed opposition to state control. This makes a fertile ground for violence when combined with a large population of underemployed and marginalized youth. The state collapse in Somalia has also increased the proliferation of automatic and heavy weapons in the hands of pastoralists. Education, animal health services, arms control activities and support for local dispute resolution processes have been the principal tools used to address some of the underlying sources of violence. These efforts have been limited in the current political environment.

Risk Management

There are many risks faced by pastoralists which is often difficult to distinguish, much less to prioritise. These populations have traditionally been less favoured by both nature and states, leaving them relatively more exposed to varied risks – climate, disease, bandits, markets, wildlife, etc. – than are their counterparts in urban areas. Addressing vulnerability requires recognising the linkages between the “productive” (or “economic”) and “reproductive” (or “social”) sectors. For example, investing in education and health services, often undervalued in the past, is now recognised as an essential investment in the productivity and capabilities of people, which expands their opportunities to diversify livelihoods and spread risk.

Cross Border issues

National policies with respect to both cross-border movement of people and animals and control of domestic animal diseases through movement restrictions and quarantines disrupt the natural flow of animals from rangeland areas with a surplus of cattle to highland areas exhibiting chronic excess demand for livestock. If such policies restrict pastoral marketing responsiveness, this would suggest a need for policy reforms aimed at finding alternative means to combat infectious animal disease and to stem cross-border violence and trafficking in contraband.

Gendered Pastoralism

The role of women among pastoralists has been much debated, in part because pastoral societies are male dominated to a much greater degree

than most other subsistence systems. Contemporary Somali women are not subservient, but live with men in a relationship of interdependence. They are considered the most resourceful persons in the pastoral economy. They market milk products, farm produce and their pastoral crafts, as well as producing them for their own use and that of their families, or giving them away, as they choose. This pattern has changed as urbanization encourages migration of young people to towns in search of work, depriving the pastoral family of their input. Restrictions on male movement because of conflict has led to a further loss of labour power, leaving women to cope with the management of the family, taking on roles vacated by men. Women today participate in family decision-making. Acceptance of such participation by society is tilting the balance in their favour and they are increasingly breadwinners for the family while still managing the domestic scene (UNICEF 2002).

9. Conclusion

The success of pastoralism stems from well-adapted principles and strategies designed to overcome the harsh and variable conditions dominant in arid areas. Somali herdsmen have evolved a system of nomadic rotation that is in harmony with their environment. Somali pastoralists are rangeland experts and their grazing system is based upon a strategy of maximum utilisation of the land with minimum depletion. Specific strategies they employ which prove to be supporting nature conservation are herd diversity and herd splitting which are techniques used to maintain the long term productivity of the range, to ensure sustainable production at a comparatively low cost, and in some cases to improve degraded rangelands.

Over generations, pastoralists have also developed risk mitigation strategies as well as institutions that enable them to negotiate access to pasture and water. Grazing lands are controlled by clans and the limits of clan territories are not clearly defined and subject to change over time. It is import for pastoralists to understand what is meant by access and the ways in which it is determined who can graze 'where' and 'when.' However grazing patterns have shifted drastically due to a number of reasons including the development and proliferation of permanent water in the form of dams, Berkeds, and the construction of enclosures and related adoption of farming practices. Other forms of land use that is also impacting on pastoralism are charcoal production, farming and range enclosures.

In the absence of a government, many traditional forms of natural resource management and control systems have been abandoned or are now ignored. Supporting Somali pastoralism requires planning for unpredictability, expanding people's options, supporting their cooperation and maximising – not restricting – their physical, economic and social mobility. If pastoralists livelihoods are going to be improved and the degradation of drylands reduced, then it is critical that pastoralism is respected and developed as a sustainable land use system

10. References