

**Changing Pastoralism in the
Ethiopian Somali National Regional State (Region 5)**

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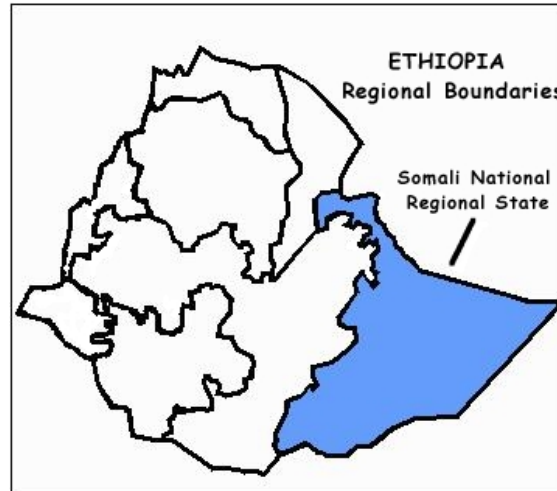
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Introduction

Aims of the study

The Ethiopian Somali National Regional State, also known as Region 5, is located in south east Ethiopia. It is inhabited by the Somali ethnic group. Map 1 (below) shows the location of Region 5 in Ethiopia and Map 2 (over page) shows the distribution of the major Somali clans within the northern part of Region 5.

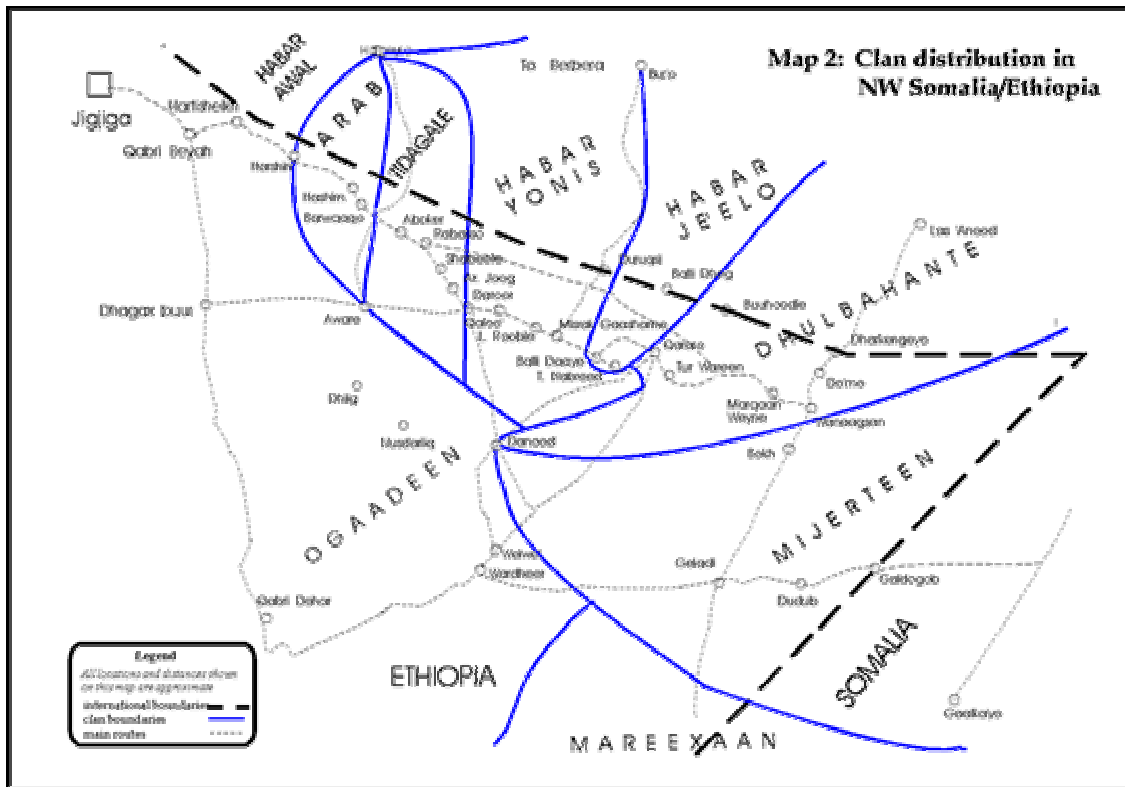


Map 1

This study aimed to examine changes over recent decades in number of water points and settlements, area of land cultivated, patterns of wet and dry season grazing, availability of fodder and livestock in a selected area of Region 5. The study attempted to understand the effects of such changes on livelihoods of pastoralists. It was prompted by concerns that the rapid growth in the number of water points in some parts of Region 5 and other factors had had an effect on the quality of grazing land and livestock productivity and that related to this that there is an increasing vulnerability to drought. The objective was not to attempt conclusive proof of these trends but rather to produce 'quick and dirty' data to inform regional policy makers of the major issues based on perceptions of pastoralists.

Recent history

South east Ethiopia has been a region racked by conflict and has experienced large inflows and outflows of refugees. In 1977/78, the Ogaden war between Ethiopia and Somalia led to huge outflows of Ethiopian Somalis into Somalia. The region remained prone to insecurity following this. Then in the late 1980s and early 1990s, the civil war in Somalia led to a reverse in refugee flows with Somalis, including those who had previously fled from Ethiopia, crossing into south east Ethiopia to escape fighting in Somalia. These refugees and returnees settled either in their home villages or in refugee camps. The change of government in Ethiopia in 1991 led to the introduction of the regionalisation process in Ethiopia. Under this new federal system, south east Ethiopia became the Ethiopian Somali National Regional State with its own regional government. The region is now largely peaceful. Government presence in much of the region remains weak, however, and government provision of services limited.



Livelihoods in Region 5

There is no precise data on the exact number of people in the whole region but the latest census carried out in 1997 indicates the number to be around 3.4 million. The local population has substantially increased in recent years due to the influx of large numbers of returnees from Somalia. The inhabitants of the region are pastoralists and agro-pastoralists. Pastoralists remain the majority of the region's population, herding combinations of camels, cattle, sheep and goats. However, agriculture has increased in importance particularly since the 1970s. Pastoralism is dominant in the lower rainfall areas of the region. Agro-pastoralism is practised in higher rainfall areas (such as around Jigjiga and Degahbour) where families cultivate privately owned land in the rainy season and at the same time keep small numbers of animals. Sorghum is the crop most commonly grown by agropastoralists in the region because of its low water demand. Maize and sesame are common in the irrigated farms along Wabe Shabelle river. Khat (*Chata edulis*) is becoming popular through-out the region as a cash crop due to its high demand as a stimulant among both urban and rural people.

Other activities include collection of frankincense from *commiphora* bushlands. Horticulture and poultry keeping have increased with the arrival of returnees from Somalia. Collection and marketing of firewood and charcoal has also increasing sharply in recent years and now represents a major economic activity.

Management and control of natural resources

Water sources for pastoralists in Region 5 include wells, rivers, boreholes and cemented underground water cisterns called birkeds. Use of wells is usually controlled by a clan¹ 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.

Birkeds have become increasingly important as a water source in recent years, particularly in parts of the region where permanent water is limited. These water cisterns are purely privately owned, and anybody who can afford to constructs their own in their clan territory. The owner of the birked has full control over the use of the water.

Grazing land is controlled by clans. However, the limits of clan territories are not clearly defined and subject to change over time. Members of a clan have the right to graze in the area of the their clan. It is possible to graze livestock in the territory of another clan subject to agreement.

Changing Somali Pastoralism

Somalis inhabit a huge area stretching from Djibouti in the north through Somalia, South east Ethiopia and Northeast Kenya. There is evidence of long term changes in the nature of pastoralism as practised in many Somali areas. This is associated with increase in number of water points and settlements and growth in area of cultivated land. In Northeast Kenya, for example, there has been a sharp increase in the number of water points since the 1970s with the drilling of boreholes and digging of new wells. This has paralleled a dramatic increase in the number of settlements. These changes have had implications for grazing patterns. Previously, there existed fairly distinct areas for dry season grazing and wet season grazing in the Northeast Province (NEP) of Kenya. From the 1970s, this pattern began to break down as boreholes were sunk in areas previously used for wet season grazing. The increase in water points, often without proper planning, has meant most areas can now be grazed in both the dry and wet season. New settlements have also impacted on rangeland as settlement dwellers keep cattle and shoats permanently grazing around the settlement creating islands of permanent grazing in previously open rangeland.

The breakdown in wet and dry season grazing patterns and an increase in livestock pressure in Northeast Kenya obviously has implications for availability of livestock fodder which in turn has had a negative effect on livestock production and health. Pastoralists perceive a sharp reduction in milk production for all species and a greater incidence of livestock diseases. The species composition of herds has also changed with increasing water points, with increasing number of cattle kept by herders who previously kept only camels and shoats. The changing nature of pastoralism in Northeast Kenya would appear to be reflected also in parts of Somalia and in Region 5.

Changing Somali pastoralism in Region 5

¹ Clan can refer to divisions at various levels of segmentation., for example the Isaaq clan is composed of a number of clans such as the Habr Je'elo, Habr Yoonis etc. These clan are themselves divided into sub clans and so on. There are no terms in Somali to differentiate between clan divisions at different levels. In this report the term clan will therefore be used to refer to divisions at any level.

A similar process of transformation in pastoralism is evident in Region 5. There have been increases in water points and settlements, new land use patterns and changes in natural resource management mechanisms. The nature of these changes varies across the region.

Here too, there is an increase in water points in the form of boreholes, wells and birkeds. In the south east of Region 5, for example, birkeds have been constructed since the 1950s, with a substantial increase since the 1970s. Farah (1997) estimates that there may be as many as 12,000 birkeds in Gashaamo district alone.

There has been an increase in the area of land cultivated and a consequent decrease in the area of land open to grazing for pastoralists. Members of previously nomadic clans such as the Gadabursi, Yabarre, Gerri-Jarso, Bartire and, more recently, the Abaskul in the Jerrer valley, have turned to cultivation in the higher altitude and higher rainfall areas such as Jigjiga, Teferei Ber and Gursum (Hogg, 1992; Tilahun et al, 1996). This has been accompanied by a move from communally to individually held land.

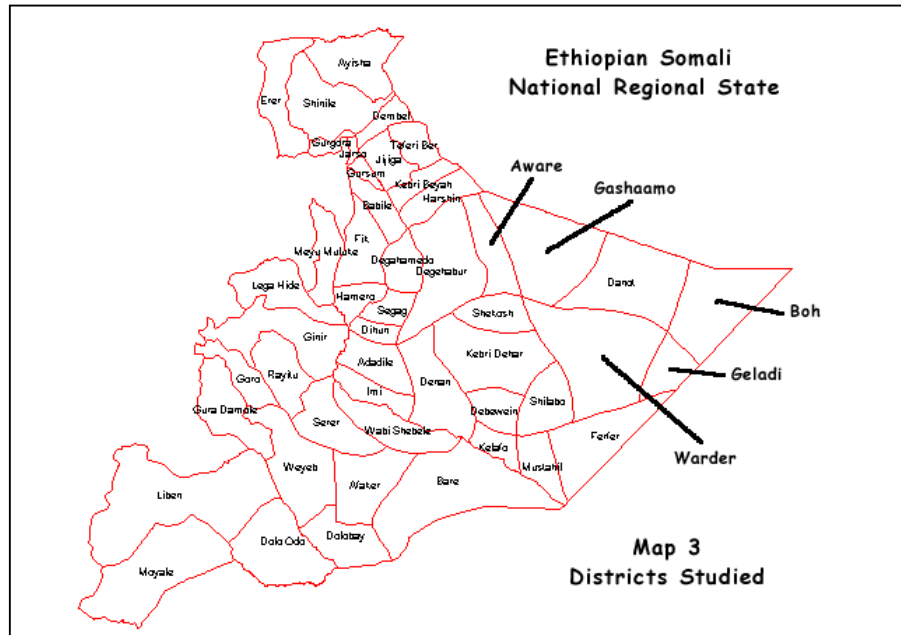
A recent phenomenon has been the enclosure of grazing land. This involves fencing of an area by an individual in order to conserve the pasture within for the owners livestock or for sale to other livestock owners. Such enclosures reduce area of land available for grazing. They tend to be more common where there is heavy pressure on grazing land although concentration of enclosures varies greatly across the region. Generally an individual has the right to enclose a piece of land in the area controlled by their clan unless the clan has agreed there should be no enclosures. In the Harshen area, for example, there is a clan agreement that there should be no more enclosures because the negative effects of many enclosures has become apparent.

The above changes have been accelerated by the influx of returnees to the region. Many returnees have taken up farming upon return as they lacked access to livestock and agriculture has been the only livelihood open. This has meant a sharp increase in the area of cultivated land since 1991. As the land best suited to farming has been brought under cultivation in some areas, more marginal land has been used. Returnees have also resorted to digging of birkeds as a means of generating income through the sale of water in the dry season. The large returnee population has also added to pressure on natural resources with activities such as charcoal burning.

Methodology

This study set out to examine the above issues in relation to a selected area of Region 5 - part of the '*Haud*' grazing area which stretches from Jigjiga along the Somali border up to Gashaamo and beyond. Historically this has been grazing land of central importance for many Somali clans as evidenced by its reference in numerous poems. It should be noted that pastoralists themselves use the term *haud* to refer to the thick bushy grazing areas, particularly favoured by camels, within the larger area generally termed '*Haud*' by others. Bushy *haud* (or *ay*) is distinguished from the open plain, *banaan* areas.

The five districts of Aware, Gashaamo, Warder, Boh and Geladi were chosen as the area of study. They are shown in Map 3 (over page). In 21 locations across the five districts we met individual and selected groups of pastoralists and carried out the same set of participatory rural appraisal exercises and semi-structured interviews.



Increase in Water Points and Settlements

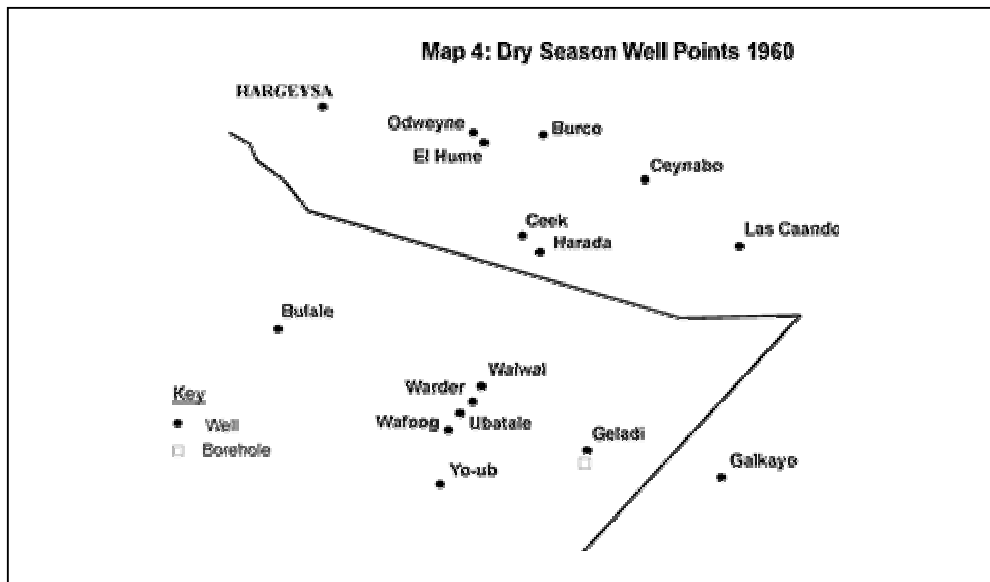
The five districts under study have shown a number of important changes in the latter half of this century. Of central importance has been a steady growth in both water points and settlements. 1960 can be taken as an arbitrary cut off point, coinciding with Somalia's independence, before which water points and permanent settlements were scarce. Map 4 shows the main dry season water points that existed in 1960. These, it should be noted represent only the major permanent water points and not seasonal wells. Aware wells, for example, are not included as according to elders in Aware, it was not until the 1960s when more wells were dug, that Aware became a significant water source.

As the map shows, a large tract of land running parallel with the Ethiopian- Somali border had no water points. Pastoralists grazing their stock in these areas took them to water at wells such as Burco and Hargeysa over the border in Somalia. Further south the wells around Warder and those at Bulale and Geladi were the only permanent dry season water points. At this time there were also few permanent settlements in the five districts, the main ones being Aware, Danot, Qorile, Warder, Geladi, Dabagorayale. There did exist in addition to these a number of seasonally inhabited settlements.

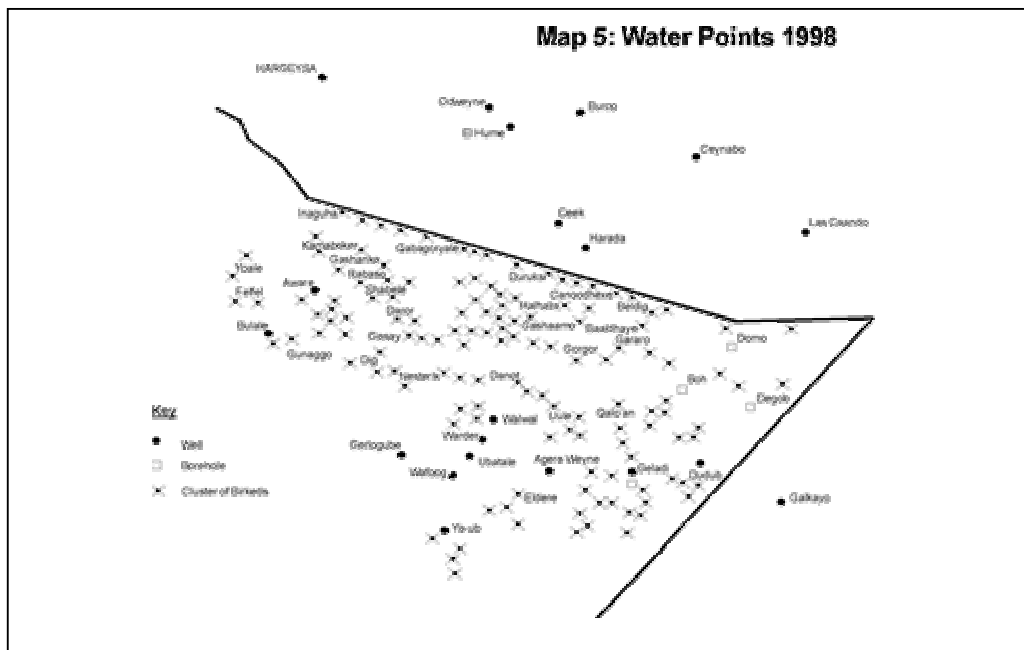
Starting from the late 1960s, this picture began to change. Water points began to increase markedly. The first few birkeds had been constructed close to the Somali-Ethiopian border in the 1950s. There was a steady increase in their number in the 1960s and then a sharp increase in the 1970s, particularly following the drought of 1974. New wells and boreholes were also constructed. For example the number of wells at places such as Aware and Geladi increased rapidly. Boreholes were drilled at Geladi, Boh, Docmo and Degob.

Generally, birkeds are constructed in clusters, a number being constructed in the same vicinity. The number of birkeds concentrated at one place varies from less than 10 to more than a thousand. The general pattern has been for a few livestock owners to begin construction of birkeds at a site. Following this an individual may open a small shop or tea shop at that place to trade with pastoralists. This marks the beginning of a settlement. Other

pastoralists build birkeds there and others come to settle in the new village. Thus the size of the settlement and the number of birkeds grows over time.



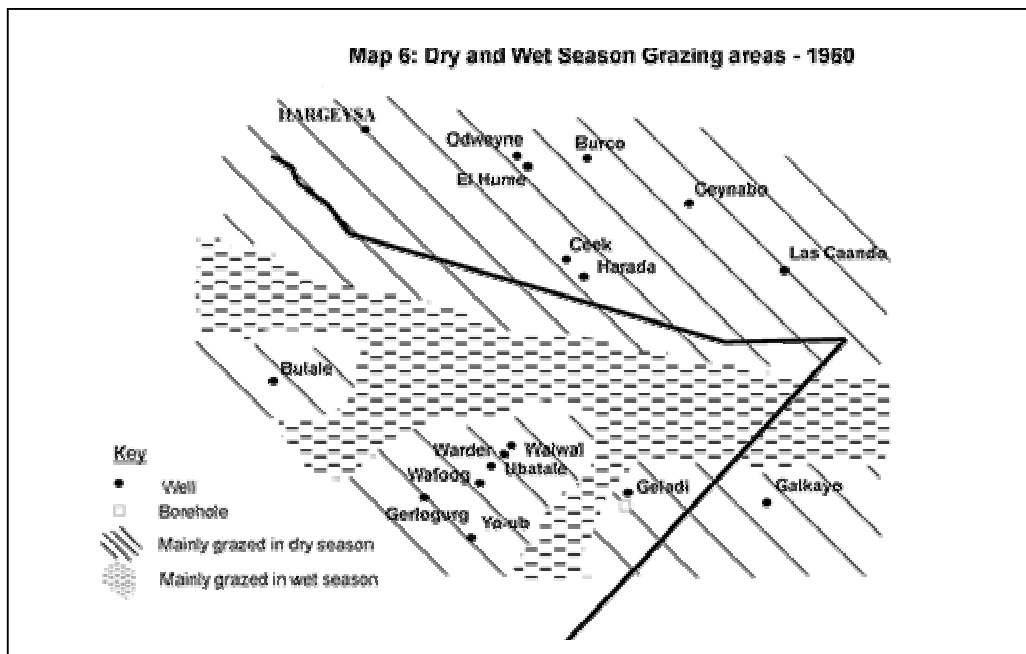
Although birkeds cannot be considered permanent water points in the sense of permanent wells which do not rely on harvesting rainwater, clusters of birkeds represent dry season water points that they provide water throughout the dry season in most years. Today, then, distribution of water points is vastly different from a few decades ago. Map 5 shows the water points that exist today in the five districts under study. The map attempts to show the wells and boreholes as well as the main clusters of birkeds. The latter are difficult to map as there is no existing record of all locations. The map is based on sketch maps drawn by communities during the fieldwork. It is thus not meant to be accurate but to give an indication of the nature of change. It should be noted that these water points shown on the map are also the site of permanent settlements, as the tendency has been for settlements to grow up at the site of new water points.



Breakdown of seasonal grazing patterns

In each of the five districts we attempted, in interviews with groups of pastoralists, to discover where stock were watered and in which areas they grazed in dry and wet seasons in the period up to 1960. The aim was to discover the extent of changes in seasonal grazing patterns today compared to the time before water points proliferated.

Previously, stock were watered in the dry season from the wells in Bulale, Geladi, Warder and its environs or those in Somalia such as Burco, Oodweyne, Hargeysa etc (see Map 4) . The areas that could be grazed in the dry season were therefore constrained by the need of stock to return to these wells for water at periodic intervals. This is every 2 days for cattle and every 3 days for shoats. Camels could stay away from the wells from 15 up to 30 days. Given the need for frequent watering, cattle and shoats could not be grazed far from the wells. Camels could be grazed at greater distances given their ability to stay longer between waterings. They could be grazed at distances exceeding 100km from the wells and spend up to 5 days journeying back to the wells from the grazing area. The area actually grazed in any dry season obviously depended on factors such as where rain had fallen in the previous season and which areas had good fodder, few parasites etc. Generally, stock would be grazed as close to the wells as good fodder could be found. In most dry years, family herding units would split in the dry season. The nomadic hut would be positioned close to the wells with women and children looking after the shoats and a few milking camels. The bulk of the camel herd would be further from the wells with boys and young men.



In the wet season, livestock would spread out far from the wells in search of fresh pasture (*cusub*) in areas that had not been grazed in the dry season. At this time the camels and shoats would often come back together and be grazed in the same locality. Camels and shoats in green grazing (*doog*) do not need to be watered. This meant stock could be grazed at long distances from the wells in the dry season. When the green grazing began to dry, they would water from standing water collected at natural pans, for example those at Danot. When these had been exhausted, as the heart of the dry season approached, livestock would resume watering from the wells, and grazing closer to these.

This meant that, to an extent, there existed identifiable areas for grazing in the dry season separate from the wet season: stock closer to the widely spaced wells in the dry season and ranging further afield in search of fresh pasture in the wet season. Map 6 shows a rough approximation of the dry season and wet season grazing areas that existed up to around 1960. This is based on information provided in interviews with pastoralists each of the 5 districts.

It must be noted that this represents an idealised pattern. It is impossible to give definite limits to the previous dry and wet season grazing areas because the areas grazed in any season varied from year to year. It depended on where rain fell, disease outbreaks, relations between clans etc. It could be that in the dry season, if pasture was scarce, camels would be taken far from the wells into the area shown on the map as wet season grazing. In general though, there was an area, at further distances from the wells, that was not grazed or was only grazed lightly during the dry season. Following the rains this provided fresh (*cusub*) pasture.

This seasonal grazing pattern changed with the increase in water points, particularly the increase in birkeds since the 1970s. Dry season water points can now be found in most areas across the five districts as Map 5 showed. Water points are found in areas that used to be mainly for wet season grazing. These areas can now be grazed heavily in the dry as well as the wet season. It is now more difficult to identify distinct areas for grazing in the wet compared to the dry season. This means that most areas can be grazed all year denying the pasture a chance to recover.

Grazing patterns have also been affected by the increase in the number of settlements, the increase in area of land under cultivation and the spread of grazing enclosures. The growth in number of settlements is illustrated by Map 5 on which each well, borehole or cluster of birkeds is also the site of a settlement. Settlements affect grazing land because those in settlements keep cattle and shoats permanently grazing around the settlement. The needs of settlements in terms of firewood and construction materials also adds to the pressure on the environment surrounding settlements. When settlements become closely concentrated together as is the case in Gashaamo district, this can have an adverse affect on previously open rangeland. The growth of farming and grazing enclosures, most notably in Aware district has meant that some areas are no longer available for livestock grazing.

The above issues are now considered in more detail for each of the 5 districts.

(a) Gashaamo District

Gashaamo district is inhabited by the Habr Yoonis and Habr Je'lo clans of the Isaaq. Gashaamo differs from the other four districts under study in that there are no permanent water points. Birkeds represent the only water sources. Before the construction of birkeds, pastoralists grazing stock in this area, had to take them to the wells of Burco, Ceek, Cel Xumey, Harada, Ood Weyne and Ceynaba in Somalia and some to Warder in Ethiopia (see Map 4 for the location of these wells). At this time, the Habr Yoonis and Habr Je'lo had very few cows due to the shortage of permanent water and the reliance of cattle on frequent watering. In the dry season, pastoralists watering at Burco and the other wells in Somalia would graze their shoats close to these wells while the camels would range to the south as far as where Gashaamo town is today. Following the beginning of the rains, pastoralists would often move their stock further to the south to the thick bushy *haud* (which begins south of Gashaamo and continues to Warder in the south and in both directions east and west). After the pasture had dried and the camels and goats required watering again, stock would be watered from natural pans in the *haud* area such as those at Danod and Hoda Weyne. Once these pans were exhausted, stock would return to drinking from the wells in Somaliland.

Pastoralists in Gashaamo district noted that the number of stock watering from Burco and the other wells in Somalia had steadily increased over time. There was heavy pressure on the surrounding rangeland during the dry season and good pasture in short supply. For this reason and to get easier access in the dry season to the more plentiful fodder further south, away from the wells, there was a demand for new water sources. Attempts by the British to drill boreholes in Gashaamo district proved unsuccessful. In the late 1950s, however, the first few birkeds were constructed near the Ethiopian - Somali border. There was a steady increase in the number of birkeds in what is today Gashaamo district in the 1960s and a rapid rise in their number from the 1970s. Those with birkeds would hope to harvest sufficient rain water in each rainy season to see them through the subsequent dry season.

By the 1980s, Habr Yoonis and Habr Je'elo pastoralists grazing in Gashaamo district had all but stopped the trek to Burco and other wells in the dry season. Birkeds had mainly replaced wells as the dry season water source. All pastoralists were now intent on constructing at least one birked for their stock. The introduction of birkeds had considerable advantages for pastoralists. It removed the need to trek long distances for water, and the arduous and labour intensive process of watering camels from deep wells. It also provided easier access to better pasture away from the heavily grazed areas around the wells.

As noted above, a number of birkeds are generally constructed at the same site. Today there are 126 clusters of birkeds in Gashaamo district. This corresponds to the number of permanent or semi permanent settlements in the district. In addition to the increase in the number of clusters of birkeds, the number of birkeds in each cluster has increased steadily over time. Thus Shimbirale, for example, had 3 birkeds at the time of the 1974 drought and has 48 today. In general, the number of birkeds in each settlement varies between less than 50 and several hundred.

Birkeds, then, have become the sole dry season water source for pastoralists in Gashaamo district and it is rare today for them to make the trek to the wells in Somalia given the long distance and the heavy pressure on those wells. If a herder has insufficient water in their birked to last the dry season, they can seek water from the birked of relatives or buy water from the birkeds of others. Failing this they must resort to buying water from water tankers which transport water from the wells in Somalia. This reliance on rain fed birkeds leaves pastoralists vulnerable to recurrent drought.

Map 5 has already indicated the geographical spread of birkeds that exists today in Gashaamo district. The area south of Gashaamo town used to be grazed mainly in the wet season. Given the proliferation of water points, it can be grazed at all times. There is no longer any clear pattern of distinct areas for wet and dry season grazing in the district.

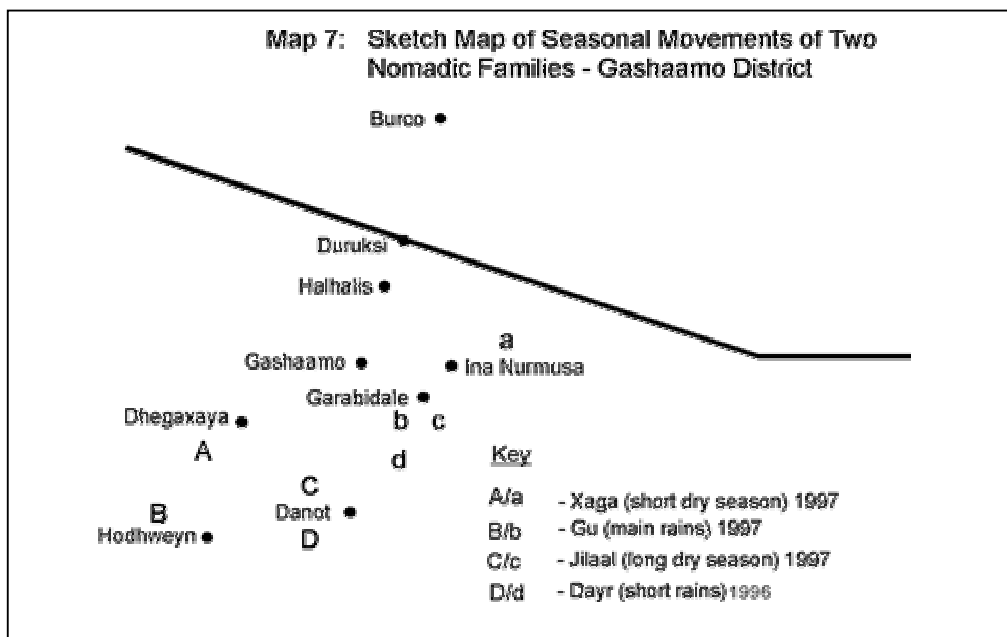
The high concentration of settlements also has a considerable impact on rangeland. Up until the late 1950s, the area that is Gashaamo district could not support permanent settlements because of the lack of permanent water. It was only following the introduction of birkeds that permanent settlements began to emerge, particularly from the 1970s. The growth of settlements to 126 today has negative effects due to permanent grazing of the stock of settlement dwellers in the surrounding area, collection of firewood and materials for constructing houses, and collection of timber and bushes for constructing birkeds and the fences which surround them.

The increase in birkeds and settlements has also had an effect on the mode of pastoralism. The Habr Yoonis and Habr Je'elo pastoralists of Gashaamo district now herd their animals over shorter distances between seasons and have become more sedenterised than before.

As can be seen from Map 5, birkeds are concentrated particularly in the northern part of Gashaamo district. From the border to Ali Jama, there are fairly open plains with sparse

covering of shrubs and bushes known as 'banaan'. From Ali Jama to Warder in the south, there is thick bushlands known as 'haud' or 'ay'. A pastoralist may own one or more birkeds spread across different locations and possess various combinations of camels, cattle and shoats in varying numbers. These variables determine his herding strategies. Cattle are normally grazed in the open rangeland to the north of Ali Jama, with camels preferring the thick bushlands of the haud.

Thus a pastoralist with a birked in Gashaamo town may graze his cattle in the banaan area close to his birked and send his camels to the haud with family members. He will either bring his camels back to his birked to water them or attempt to access a birked of a relative closer to the haud if he has none there himself. Given the high inter-annual rainfall variation and its high spatial variability within any one year, it is a priority for those who have the means to construct more than one birked in order to maximise options in terms of which areas can be grazed in any one season. The area a herder chooses to graze his stock depends on where has good pasture, access to a birked, concentration of other stock and concerns over livestock disease and security.



Since the introduction of birkeds in Gashaamo district, there has been a sedenterisation of pastoralism. Pastoralists are more closely identified than before with a smaller area. They move over shorter distances between seasons compared to the time when they watered from the wells in Somalia. This can be illustrated by looking at the movements of two Habr Yoonis pastoralists over a year, both herders of camels and shoats (see map 7). A, B, C, D and a, b, c, d correspond to the position of each in the seasons of *xaga* (short dry season), *gu* (main rains), *jilaal* (long dry season) and *dayr* (short rains) over the period 1996/97. This can be compared with the period before the construction of birkeds when families and stock would range over hundreds of kilometres between seasons, for example from close to Burco in a dry season to beyond far south of Danot in the following wet season. It should be noted, however, that in exceptional years, camel keepers can and still do move large distances between seasons.

(b) Warder District

Prior to 1960, the only dry season water points in Warder district were the Warder wells and those in its vicinity: Welwlel, Gerlogube, Afyerado, Ubatale, Wafdug and Yo'ub (see map 4). Ogaden, Majertein and Isaq pastoralists watered from these wells. As described for Gashaamo district, there existed, to an extent, identifiable areas for dry and wet season grazing. The Rer Ibrahim sub clan of the Ogaden, for example, watered from Warder and Walwal wells and in the dry season would graze their livestock in the area close to these wells and then, following the rains, would move further north towards Danod in search of fresh grazing.

From the 1960s, birkeds began to be constructed in Warder district. The demand for additional water points was given impetus by the increasing pressure on the wells and desire for better access during the dry season to pasture at further distance from the wells. Birked construction rapidly increased from the 1970s. As for Gashaamo district, the effect has been to disrupt the previous seasonal grazing pattern. For example, Map 5 shows the heavy concentration of clusters of birkeds today north and west of Warder in the area inhabited by the Rer Ibrahim sub-clan. The area that was previously grazed mainly in the wet season can now be grazed throughout the dry season by those watering stock from birkeds.

It is important to note that Warder district is different from Gashaamo district in that it is served by both permanent wells and birkeds. Some pastoralists have access to sufficient water from birkeds to allow them to use this source solely without recourse to wells. Others may use birkeds at the beginning of the dry season and then use the wells once the birked water is exhausted.

(c) Boh and Geladi Districts

Boh and Geladi districts are inhabited mainly by the Dulbahante and Majertein clans with other clans such as the Marahan found in lesser numbers. Up to the 1950s, pastoralists grazing in present day Boh and Geladi districts watered from the wells of Warder in Ethiopia and Galkacyo, Las Caanod or Garowe in Somalia (see Map 4 for the location of these). Although Geladi wells and other shallow wells in their vicinity were also used, they did not always yield sufficient water in the dry season to represent a reliable permanent water point.

Water points in the area increased from the 1950s with the sinking of a borehole close to the Geladi wells in 1954. The shallow wells of Geladi, Dudub, Durwayale, Korof, Cel Furdan, Gaal Dheer and Godene Dayeer became more significant water points around this period as existing wells were improved and new ones dug at these sites. The Boh borehole was drilled in 1963 followed by Docmo and Dogob boreholes in the 1970s.

From the 1970s, the number of birkeds also increased substantially. Now there are 65 villages with birkeds in Boh district and up to 55 in Geladi district. The number of birkeds in each village varies widely. There are estimated to be 3,000 birkeds around the village of Qalo'an for example whereas other settlements have as few as 20. The building of birkeds has been stimulated with the arrival of refugees fleeing Somalia since 1988. They have settled in villages creating extra demand for water and hence the need for more birkeds.

As for Warder and Geladi districts, the growth of birkeds has meant the disruption of previous patterns of wet and dry season grazing. Birkeds and boreholes have been introduced in areas such as that bounded by Jinacle, Marqan, Anglo and Docmo which was previously grazed mainly in the wet season only but is now grazed throughout the year.

(d) Aware District

Aware district shows the same changes noted in the above districts in terms of increase in water points and consequent effect on seasonal grazing patterns. However, in Aware district there is an additional complication in terms of the effects of the refugee camps of Daror, Rabasso and Kam Abokor (see Map 3 for location of refugee camps).

Pastoralists in Aware district are mainly from the Idigale (Isaaq) and Ogaden clans, with Idigale occupying the territory from the border to Aware town and Ogaden south of Aware. Up to the early 1960s, the water points used by pastoralists grazing stock in Aware district were the Bulale wells in Ethiopia and those of Burco, Adadle, Oodweyne and Hargeysa in Somalia (see Map 4 for the location of these points). The Idigale (Isaaq) pastoralists would water mainly, though not exclusively, from the wells in Somaliland and the Ogaden from Bulale. Wells existed at the settlement of Aware, dating back to the 1920s but elders report that these did not become a significant dry season water point until the 1960s when new wells were dug. The distribution of these wells formed the foci of the seasonal grazing pattern. For example, elders in Daror explained that previous to the building of birkeds, they watered from the wells of Oodweyne, and in the dry season they would typically graze in the area from these wells up to Dabagoryale on the Ethio-Somali border. Then in the wet season, they would frequently graze around present day Daror and beyond. Elders in Ramasso said they previously watered from the wells of Hargeysa and in the dry season typically grazed the area from the wells up to the border and beyond, then in the wet season would often graze the area around present day Rabasso and south into the bushy haud which lies beyond.

The number of water points in Aware district has sharply increased since the 1960s. New wells in Aware settlement have been dug and those in use now number more than 250. The first birkeds were constructed in the 1950s close to the border. Construction of birkeds has continued since then with new concentrations moving southwards from the border over time. Most birkeds are concentrated in the area bounded by Aware and Daror and the border. This is the area controlled by the Idigale clan (Isaaq). The area south of Aware town, controlled by the Ogaden clan, has seen significantly less development of new water points. As Map 5 shows, there are some clusters of birkeds between Aware and Bulale, but these are few compared with the area between Aware and the border. This in part due to the fact that the Ogaden pastoralists have access to permanent water at Bulale. Of the pastoralists in Aware District, then, some water solely from wells at Aware or Bulale, some rely almost entirely on birkeds and some use both wells and birkeds.

A breakdown in the pre 1960s seasonal grazing pattern is particularly noticeable in the Idigale territory. Here there is a heavy concentration of birkeds and all areas can be grazed at all times of the year. South of Aware in the Ogaden territory there has been less of an increase of water points. This is reflected in the fact that for these Odagen pastoralists there remains a greater seasonal variation in grazing areas.

Rangeland has also been affected by the influx of refugees into the district and by the growth of farms and grazing enclosures. Aware district, of the five districts considered in this study, has been most affected by refugees and returnees notably those concentrated in the three camps of Daror, Rabasso and Kam Abokor.

The refugees and returnees have had an impact on the environment in two respects. Firstly the areas around the refugee camps have become denuded of vegetation for a number of kilometres as refugees have sought firewood and materials for construction. This has meant that some areas previously grazed by pastoralists are no longer utilised creating increased pressure on existing grazing areas. For example, Idigale elders in Shabelle (between the camps of Daror and Rabasso) explained that since the establishment of the refugee camps, they have been forced to graze their livestock further south encroaching on the area normally grazed by the Ogaden clan.

The second effect is that the refugee camps and the returnees self settling in villages have created a demand for water and fuelled the unplanned growth of new water points. Elders in Daror noted that there had been an increase in birkeds since 1988 particularly in the area bounded by Dumacad, Ramasso, Shanderbi and Goseye.

In Aware district, the practice of individuals enclosing land to conserve fodder emerged in the late 1980s. In Aware settlement, for example, elders reported that enclosures began ten years ago mostly created by those keeping cattle. They tend to be most concentrated around the settlement itself where fodder is most in demand in the dry season by those bringing stock to water at the wells and settlement dwellers who own stock. Pastoralists see grazing enclosures as detrimental because they prevent access to previously communal grazing areas and increase pressure on remaining areas. They represent in effect a shift to individual from communal ownership of grazing land. It is for this reason that communities in Shabelle, Rabasso and Kam Abokor reported that they had now agreed among themselves not to allow grazing enclosures.

Grazing enclosures have become widespread in other areas of Region 5 but up until now are not common in the other four districts covered in this study. Some enclosures have begun to emerge in Gashaamo district, however.

There has also been an increase in the area of land under cultivation in Aware district. As for grazing enclosures, an individual has the right to enclose land for cultivation within the area of their clan. Agriculture has been practised in some parts of Aware district since early in the century. This contrasts with the other four districts under study where agriculture remains rare and where it exists has been introduced over the last couple of decades. However, in Aware district agriculture has become more common since the 1970s. The reason most commonly given for this is the large number of returnees and refugees who have flooded into Aware district since 1989/90, many with no or few livestock and little alternative but to try and supplement livelihoods with cultivation.

In sum, then, all five districts in the area of study have seen an increase in pressure on grazing land relating to increases in water points and settlements and a breakdown in seasonal grazing patterns. There are, though, notable differences between and within these districts. Gashaamo district, in contrast to the others, relies solely on birkeds. The others rely on combinations of wells and birkeds. In the north of Aware district the impact of refugees and returnees is felt more than in other districts. Enclosures and cultivated land are also more common there. In the south of Aware District, there is much less concentration of birkeds compared to other areas in the five districts of study. This is reflected in the fact that pastoralists in Aware district retain some pattern of seasonal movement.

Increase in Livestock Populations.

Adding to the pressure on grazing land, appears to be an increase in livestock populations. In many of the areas inhabited by African pastoralists, the issue of increase in livestock populations has become a contentious issue. There have been claims that rangelands are overstocked with a consequent need for controlling stocking rates. More recently, new theories of range management have suggested that these claims are exaggerated and many of the range management projects aimed at exercising controls on pastoralists have therefore been ill considered. This approach argues that given the uncertain climate in arid lands, the size of livestock populations are controlled by droughts rather than the availability of vegetation. Debate on these issues is hampered by the lack of accurate data on population changes in most pastoral areas.

The above issues are relevant to any discussion about human and livestock population change in Region 5. There is no accurate data to provide information on long term changes in populations. Population increase cannot simply be assumed. The picture is also complicated by the large movements of population in and out of the area due to war on both sides of the border.

These question of increasing livestock populations was discussed with groups of pastoralists across the five districts. There is a strong opinion that populations have increased. Particularly, the increase in the number of family herding units was stressed. Increases in livestock populations were perceived to be related to increasing water sources which allow larger populations to be supported, decreased mortality from epidemic diseases and in some areas to the influx of returnees and or refugees with their livestock.

Decline in Availability of Livestock Fodder

Changes in availability of livestock fodder were investigated in 7 sites (Shimbirale, Halhalis, Welwel, Jinacle, Dudub, Shabelle, Kore). The aim was to investigate the perceptions of pastoralists in relation to long term change in the availability of plant species grazed by livestock since the drought of 1974, which was taken as a reference point from when the number of birkeds increased most rapidly.

A selected group of pastoralists in each of the centres were asked to name the 10 browse and 10 grass species most favoured by their livestock in the area identified as their *degan* (grazing area). For each species named, they were then asked to rank the availability of that species today compared to 1974. It was explained that the aim was to identify trends of availability for each species over the period, rather than any short term fluctuations due to poor rains the preceding year.

To quantify the change in availability of each species the analysts were asked to describe change in availability in terms of percentage increase or decrease out of 100. (It is common in Somali to quantify change in terms of out of 100 - *boqol kiba* . This method after some trial and error was found to be easier than other methods of ranking). Thus for a particular species of grass, a group may estimate a reduction of 20% since 1974 or alternatively an increase in availability or no change.

(a) Reduction in availability of grasses

In each of the 7 sites, then, the analysts ranked the change in availability of the ten most palatable grass species in their grazing area. The table below shows the example of the information collected in Halhalis.

Name of plant (Somali)	Name of plant (Botanical)	Perceived change in availability
Dareemo	<i>Plumulosis sp</i>	-80%
Majeen	<i>Killeri sp</i>	-50%
Badhooli	<i>Tenellus sp</i>	-50%
Balxoore	<i>Hirtigluma sp</i>	-30%
Jabioke	<i>Cenchrroides sp</i>	-80%
Garogaro	<i>n/k</i>	-80%
Saddexo	<i>Detyleclium aegyptium</i>	-50%
Duur	<i>n/k</i>	-50%
Badhiweyne	<i>Rupestaris sp</i>	-100%
Daris	<i>n/k</i>	-80%

The table shows that pastoralists in Halhalis perceive that all ten of the most palatable grass species have declined significantly in availability. This analysis was repeated by the groups of pastoralists at each of the sites.

(b) Reduction in browse species

In each site of fieldwork, pastoralists were asked also to name the ten most palatable browse and to analyse change in availability of each of these species in the same way. The example of the results of Halhalis shown below.

Name of browse species (Somali)	Name of browse species (Botanical)	Perceived change in availability
Bilicil	<i>Acacia milifera</i>	+50%
Gahayd	<i>Fruticosus sp</i>	-50%
Hohob	<i>Grewia bencillities</i>	-50%
Dhuyac	<i>Commipherooides sp</i>	-30%
Maded	<i>Cordia monoica</i>	-50%
Dhafarur	<i>Grewia tenax</i>	-30%
Himir	<i>Grewia indigofera</i>	-50%
Jilab	<i>Atripicifolia sp</i>	+50%
Jadeer	n/k	-50%
Yucub	<i>Angustifolia sp</i>	-30%

The table shows a perception among pastoralists in Halhalis that 8 out of the ten species they regard as most palatable have declined sharply in availability since the drought of 1974. The two species that have increased are thorny species. Their increase was related to invasion in areas where grass species have declined. This perception of the majority of most commonly grazed browse species declining sharply except for certain thorny species was mirrored across the other 6 sites.

The data shows, then, that all the grass species rated as most palatable are perceived by pastoralists as having declined since 1974. Most are perceived to have declined sharply. The rate of decline is perceived as more severe for grass species than browse species.

Pastoralists relate the decline in availability of livestock fodder to the increase in the number of birkeds and settlements. They note also the increase in livestock populations in the area. In all places it was stressed that rainfall has been less reliable over the last 20 years. Another factor mentioned was that there is now increased run off of rain water because of the increase in roads and channels for birkeds and farms and this leads to less standing water on the ground. Pastoralists in Aware district also referred to the effects of refugee camps as an important factor.

Implications for Livestock Health and Production

Alongside changes in fodder availability, trends in livestock milk production were investigated across the area of study using participatory ranking exercises. The groups of pastoralists in each site were asked to analyse changes over time in milk production of their stock with the aim of identifying broad trends in production levels for camels, cattle and shoats. In order to do this they were asked to consider the milk yield from an average camel comparing three time periods. (The same was then done for cattle and shoats). These were 1960 (Somali independence) to 1974 ('*daba dheer*' drought); 1974 to 1986 ('*gaari gaari sar*' drought); and 1986 to 1997. These years were chosen after consultation with participants to give time

periods roughly similar in length bounded by dates with which all were familiar. The pastoralists in each of the sites of fieldwork were given 20 stones and asked to divide these between three symbols, each representing one of these time periods. Stones were distributed, by the analysts at each site, across the three periods according to the perceived level of milk per head of stock in each. The distribution of stones provoked much discussion and stones were moved around until consensus was reached. The intention was to understand perceptions in changes over time in the relative per head milk yield for each the three types of stock.

The results for camel production are summarised below for five sites.

Place	1960-1974	1974-1986	1986-1997
Boh	10	7	3
Dudub	10	6	4
L. Rer Roble	10	6	4
Shabele	10	6	4
Kore	10	6	4

Cattle milk and shoat milk production were also shown to have declined in similar proportions illustrating a perception among pastoralists of a sharp decline in milk production for all species, with the extent of the perceived decline to be of similar extent across the five districts. A number of reasons were put forward for this marked decline. Notable among them was decline in availability of most palatable fodder species due to increased pressure on grazing land and to poor livestock health.

The same groups of pastoralists perceived a negative trend in livestock health. Dense livestock concentrations and continuous occupation of areas since seasonal grazing patterns broke down was held responsible for increased prevalence of disease and higher ticks and worm loads. This increase in the prevalence of disease and parasites was held by pastoralists to be related to declines in milk production.

It should be noted that, in using the subjective analysis of informants in analysing the past in this way, there may be a tendency to view the past as extreme. There is also a danger that respondents view a study such as this one as the precursor to a development project starting and therefore exaggerate the extent of any problems. The above data is not presented as scientific but rather an analysis of prevailing opinions among pastoralists.

Another noticeable change related to livestock production is the reduction in the interval between which camels are watered. This was reported to have declined in all areas usually from around 30 days in the 1970s to around 10 days today. This reduction was reported to be due partly to the increased availability of water and partly to reduction in the availability and quality of fodder which means that camels are unable to stay as long without water.

Effects on livelihoods: Increased vulnerability

The information outlined above on trends in milk yield and livestock health is clearly of a preliminary nature. Further research is necessary to substantiate it. Nevertheless, in spite of wide variations between years caused by higher inter annual variability in rainfall, there has

been, we would maintain, notable decline in milk production and livestock health. This obviously has important implications for the livelihoods of pastoralists.

It would appear that poorer herders are most vulnerable to decreased livestock milk production. They have less livestock and reduction in milk production has therefore effected them more. Those with few livestock are more reliant on purchased rice and cereals than those who have a larger herd and therefore more milk. They need to sell livestock to purchase cereals yet have fewer livestock with which to do this.

The change to watering from birkeds instead of wells, and the move by pastoralists, particularly the Habr Yoonis, Habr Je'elo and lidigale of the Isaaq, to start keeping cattle has also had implications for the vulnerability of livelihoods. We have seen that some pastoralists such as those in Gashaamo district rely solely on birkeds to water stock. Others use a combination of wells and birkeds and some, particularly the Ogaden in the south of Aware, may use wells only. Pastoralists who rely solely on birkeds to water their livestock and who do not have access to wells are particularly vulnerable in times of drought. If their birked runs short of water they can move their stock to other birkeds, either those of their relatives or of others from whom they will purchase. However, in times of drought when all birkeds are empty, it is necessary to purchase at high cost from water tankers which transport water from permanent water sources, often over long distances.

This is the only option for pastoralists in Gashaamo district and the north of Aware district. Searching for water from permanent wells such as Burco in Somalia, where they watered prior to the construction of birkeds, is no longer considered an option by most. For pastoralists in Warder, Boh and Geladi districts, the presence of wells and boreholes as well as birkeds, gives some extra options in time of drought. However, the number of livestock means that pressure on permanent water sources is very high at such time, forcing some to buy water.

The need to buy water in drought means pastoralists are forced to pay high prices for water at a time when livestock prices plummet. A herder may be forced to sell a significant proportion of stock to pay for the water to enable his stock to survive. Those most vulnerable are those with few stock, those with cattle rather than camels (as camels are able to go much longer periods between watering and even when weakened can be herded long distances to alternative water sources) and those settled in villages rather than nomadic (as it is less easy for them to move with their stock to find alternative water. Two examples will be used to illustrate these points.

Example 1

The example concerns a poor herder who returned from Somalia in 1988 to the village of Urmadug about 50 kms south west of Geladi. He has a small number of shoats and cows and is head of a household which comprising 12 people. Apart from his livestock, his only other source of livelihood is help from relatives. He has no birked of his own but is able to get water free of charge from the birkeds of relatives during the dry season. This is more difficult however, if it is a dry seasons when water runs scarce.

In 1996, the *dayr* rains, expected in October/November failed and there was a drought until the *gu* rains arrived in April. At the beginning of the drought he had 60 shoats and 10 cows. There was no water in the birkeds in Urmadug by the time the *dayr* was expected. The nearest permanent water is at Geladi where there are wells and a borehole. The wells ran dry during the drought and there was very heavy pressure on the borehole which could not accommodate all those who sought water there.

Like other livestock owners, he was therefore purchasing water from water tankers bringing water to Urmadug. He was forced to sell livestock to pay for this water. He was also selling

stock every week to pay for food. His livestock were producing very little milk during this drought time. The price of livestock fell during the drought as the price of water rose. Water was costing 25,000 Somali Shillings for a 200 litre drum. The price of shoats had fallen so that for example a 3 year old sheep costing 100,000 shillings before the drought fell to 40-50,000 shillings. The price of a 4 year old bull had fallen from 250,000 to 100,00.

He sold 15 cows and 2 bulls to pay for water and food. 25 shoats and 5 cows died from the effects of the drought, By the time the *gu* rains arrived in April, he was therefore left with 20 shoats and 3 cows i.e. one third of the stock at the beginning of the drought.

Example 2

The second example concerns the village of Baaldhaye to the east of Gashaamo in the territory of the Habr Je'lo (Isaaq). Abdullahi is an elder who keeps shoats but does not have camels or cattle. He is the head of a household of ten. He does not possess his own birked but usually waters his stock from the birkeds of relatives and friends in Baaldhaye. Before the drought at the end of 1996, he had 150 shoats. The birkeds in the village had run out of water in the run up to the expected *dayr* rains in 1996. When these rains failed, therefore, there was no water in the birkeds there. Abdullahi, like the other herders, had to purchase water from tankers transporting the water from Burco, Caynaba and Geladi. At the height of the drought, one 200 litre drum of water was costing up to 55,000 Somali shillings. Abdullahi estimates that he sold up to 44 shoats, at varying prices, during the drought period (i.e. up to the time of the *gu* rains in April/May) in order to buy water. In addition he sold 26 shoats to buy food. By the end of the drought, therefore, his herd had reduced from 150 to 80 shoats.

The Future: the water dilemma

This report has dealt with the effects of increases in settlements and water points, particularly birkeds. Pastoralists are aware of the negative effects associated with the increase of these. There remains, however, a demand for new water points as evidenced in discussions with pastoralists in each of the five districts.

As the previous section illustrated, for each of the five districts water supply remains precarious and is most precarious following seasons of low rainfall. Most pastoralists in the area under study, even those with access to a permanent water source, perceive a need to maximise access to birkeds. Without secure access to water, the very survival of their stock is threatened. Birkeds continue to increase in number. In this sense more water takes precedence over considerations of negative effects on exploitation. There is a dilemma, therefore, namely that more water points are a necessity yet more water points will compound the problems of declining pasture and declining livestock production.

Management of new water sources is therefore essential. One possibility would be to consider ways of restricting new birkeds to existing centres to conserve grazing areas. Up to now the pattern has been for the number of birkeds at each centre to increase in number and for new clusters of birkeds to emerge. The latter is related to three factors. Firstly, it is desirable to start birkeds in a new place away from other settlements because the grazing there is likely to be better than that surrounding existing settlements. Secondly, an existing settlement may have many birkeds extending up to a few kilometres around the settlement. Each birked has a long water inflow canal extending away from it to channel water into the birked. Existing birked owners are sometimes unhappy about a new birked being sited close to them which may affect their rain water harvesting. Thirdly, there is sometimes competition between clans with each wanting to establish new centres with birkeds in their territory. Establishment of a

settlement inhabited by certain clan reinforces a clan's claim to control of the surrounding grazing land.

However, in some areas traditional natural resource management institutions are responding to the situation. Communities among themselves have agreed to refrain from constructing birkeds in certain areas in order to conserve these areas for grazing. These agreements are based on Somali traditional law, 'xeer'. *Xeer* refers to agreements made within a clan or between two clans. For example, between two clans or within a clan there may be agreement on matters such as the level of compensation for types of crimes committed by one individual against another. This is the *xeer*, and if a crime is committed elders will solve the matter according to this *xeer*.

In Gashaamo district, the Habr Yoonis clan have agreed that no new birkeds should be constructed in the plain grazing area (*banaan*) between the settlements of Hasha Agolo and Bodha Dheere. This is in order to conserve these areas for grazing. There is also a wider agreement among the Habr Yoonis that in the area from the border in the north to Ali Jama in the south and from Donbiriley in the west to Garabildan in the east, birkeds should be only constructed at existing settlements. This is to prevent new birkeds and settlements starting in the remaining areas of grazing land between the present settlements. The *xeer* was agreed upon 2 years ago at a meeting of Habr Yoonis elders in Gashaamo. It was agreed at the same time that every birked owner should be responsible only for their own fence and inlet and beyond this cannot stop others constructing a birked in their vicinity. This is so that individuals who want to construct birkeds will not be prevented from doing so at existing settlements and forced to construct outside an existing settlement in breach of the *xeer*. Habr Yoonis elders cited the example of one person who had broken the *xeer* and began constructing in a forbidden area. Although he had spent considerable resources preparing the birked, the elders stopped construction.

There is also an agreement between the Habr Yoonis and their southern neighbours, the Ogaden clan, which limits the construction of birkeds in the bushy *haud* grazing area south of Ali Jama settlement. There had been numerous conflicts between the Habr Yoonis and Isaaq over control of territory. It was subsequently agreed between the 2 clans that Danot should be the border between them and that each could construct 16 birkeds there. In the *haud* north of Danot to Ali Jama, controlled by the Habr Yoonis, and south of Danot, controlled by the Ogaden, there should be no birkeds constructed. This was in order that there should be a buffer zone between them and also to maintain the area as a prime grazing area for camels.

This agreement has largely been kept to by both sides. However, there is growing pressure to construct birkeds to give close access for livestock to water in this good grazing area. This can be seen by the recent start of construction of 20 new birkeds 5 kms south of Ali Jama on the fringes of the bushy *haud*. Elders noted that this was permitted under the *xeer* because it was close to Ali Jama settlement.

The Rer Isaaq (Ogaden) pastoralists who inhabit the area south of Aware also have agreements limiting the construction of birkeds. Rer Isaaq elders came together in Aware 3 years ago and agreed that birkeds should only be constructed in existing villages except along the Wadadacad road between Aware and Dig where it is permissible to construct birkeds. However, in 1997 birkeds were constructed at Balidure against the *xeer* and a new settlement started. Negotiations among the community are still ongoing about this issue. The people who started the birkeds were returnees from Somalia. They arrived with no means of livelihood and birkeds represent a means of income. (In the last drought birked owners were able to sell water at a high price to Isaaq pastoralists coming from north of Aware.) For the lidigale (Isaaq) pastoralists who inhabit the area north of Aware up to the border there is *xeer* against constructing birkeds in the *haud* area north from Aware up to Gashaamo and Kam Abokor.

In Geladi and Boh districts, the Majertein and Dulbahante pastoralists inhabiting the areas reported that there was no *xeer* within or between the clans on where to construct birkeds. It was said that although such agreements were desirable, it was difficult because of the clan issue and because birked owners in existing settlements sometimes discouraged others from building birkeds in their vicinity forcing them to construct at new places. In addition, attempting to enforce agreements preventing new settlements could lead to conflict if a clan section felt it was being denied the right to establish a new settlement in the territory it controlled. For this reason some pastoralists raised the need for the government to adjudicate in these matters. The administration in Boh reported that it had attempted awareness raising on the negative effects of new settlements among communities in the district.

As outlined previously, in some areas, pressure on grazing land has increased due to the fencing of previously communal grazing land by individuals for grazing enclosures. Of the five districts, Aware is most effected. Recently, however, communities in Shabele, Rabasso and Kam Abokor of Aware district have agreed to forbid the presence of grazing enclosures and these have been destroyed in the surrounding areas.

The essence of the water dilemma is the continuing need for more water by both pastoralists and settlement dwellers in spite of the negative effects these are likely to bring. Pastoralists offered well spaced boreholes as the solution to the problem. This they suggested would obviate the need for more birkeds and prevent their spread into grazing land at the same time as ending uncertainty inherent on depending on this rain fed water source. At the same time, the possible environmental effects of too many boreholes was appreciated. In some areas, particularly Gashaamo district, drilling boreholes is not an option given the deep water table. In this case, limiting the construction of new birkeds to existing centres to allow for more water while limiting the impact on grazing land caused by the establishment of new centres. Some communities have begun to address this through traditional law. Another option would be government regulation of new water points. This would be unlikely to succeed, however, without community support and given the current weak presence of regional government in much of Region 5. A possibility, therefore, would be government recognition and support for traditional laws on natural resource management agreed among communities.

Recommendations

1. There is a need for awareness raising among communities in areas where the number of new settlements with birkeds is threatening rangeland. This is an activity best done by South-East Rangelands Development Project (SERP). SERP should also assess which parts of the region are most at risk from uncontrolled expansion of birkeds and concentrate on raising the issue with these communities first.

2. The aim of this awareness raising should be to facilitate the agreement of *xeer* by communities on limiting the number of new settlements similar to that agreed by the Habr Yoonis in Gashaamo district where new birkeds can only be constructed in existing settlements.

3. *Xeer* agreed by communities should also address the issue of grazing enclosures and farming and attempt to strike a balance between the livelihood needs of some individuals in pursuing these activities and the needs of pastoralists for adequate grazing. Lack of agreement on these issues can lead to conflict

4. *Xeer* agreed by communities should be recognised by the administration and enforced by them if it is broken.

5. Experience in other countries suggests that intervention by government to control the unplanned spread of birkeds if not based on local arrangements will not be effective.
6. The regional government should develop a policy on the issue of uncontrolled growth of birkeds and settlements and on the issue of growth of grazing enclosures and farms in pastoralist areas.
7. There is a need for timely drought early warning information to be collected in relation to those areas which rely solely or mostly on birkeds. But for the timely arrival of the gu rains the drought in early 1997 would have turned into a disaster.
8. "Off-the-Shelf" plans should be prepared for responses to drought in the above areas. In the last drought there were insufficient tankers both public and private to deal with demand for water.
9. Pastoralists reported that the solution to the problem of spreading birkeds was properly spaced boreholes. More boreholes in areas where it is feasible to dig should be investigated. However, any new boreholes should be carefully planned as the experience from Northeast Kenya shows that new boreholes can have negative effects on rangeland if improperly planned.

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