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Traditional Early Warning Systems and Coping Strategies for Drought Among Pastoralist Communities
Northeastern Province, Kenya

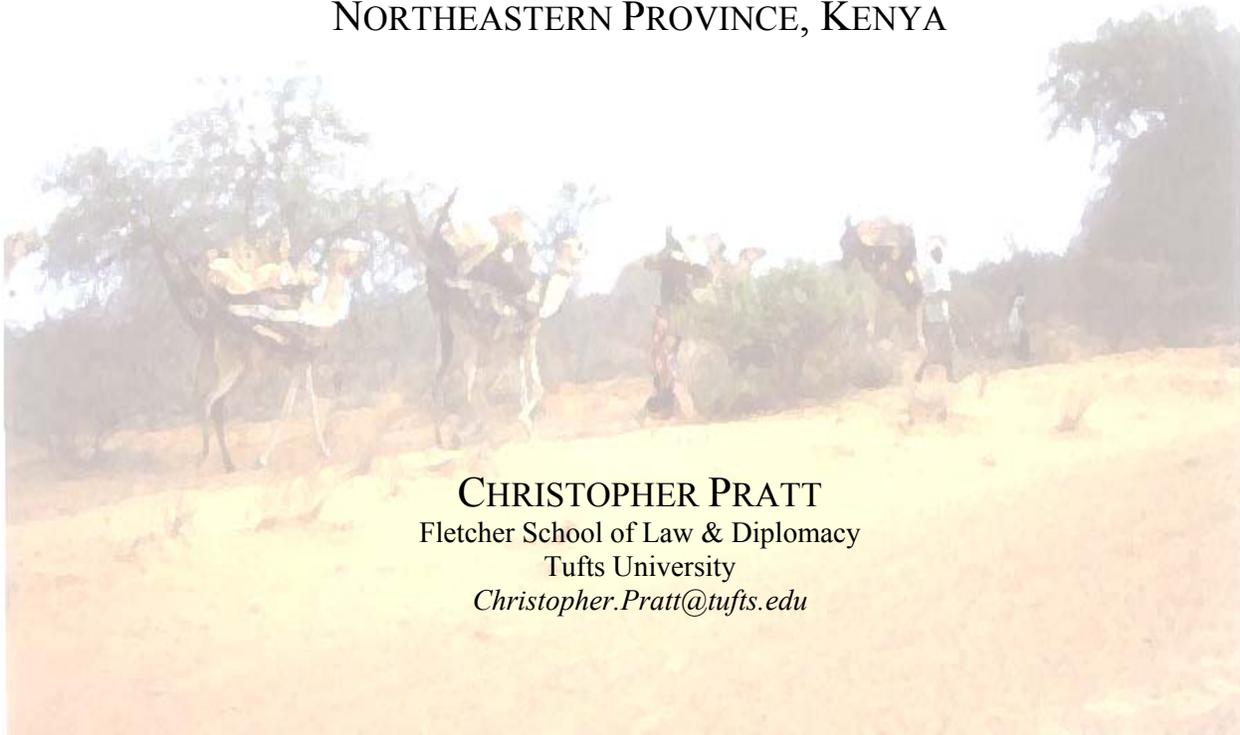
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TRADITIONAL EARLY WARNING SYSTEMS & COPING STRATEGIES FOR DROUGHT AMONG PASTORALIST COMMUNITIES NORTHEASTERN PROVINCE, KENYA



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Executive Summary

Traditional early warning systems and coping strategies employed by pastoralists in Kenya's Northeastern Province in anticipation and response to drought are rich in their diversity.

Traditional drought early warning systems are based on three precepts. First, pastoralists must have detailed knowledge of when the major rains should arrive – understanding what is implied about the probability of future rain by variance in wind, humidity, and temperature from expected conditions. Second, pastoralists need to know how to interpret the behavior of animals and plants, which serve as valuable indicators for subtle fluctuations in temperature and humidity. Appropriately interpreted, local pastoralists can forecast major rains four weeks before their arrival. Similarly, the absence of these natural indicators suggests the absence of rain i.e. drought. Third, observed historical trends allow for reasonable predictions of future weather patterns. However, the increasing severity and frequency of drought over the last decade has rendered this latter form of forecasting less reliable than it has been in the past.

Drought coping strategies are communal activities that begin with managing livestock resources, through herd diversification and distribution, grazing patterns, and food storage in anticipation of poor rain seasons. Traditionally, the primary reaction of households and communities to a drought forecast is to come together and pray for intercession by Allah. This process also involves a mutual assessment of the resources currently available to communities for strategic redistribution or redeployment in the event of drought, as directed by elders in the communities. Long-distance migration and the other coping strategies discussed in this paper are generally not employed until the severity of drought and its spatial distribution are ascertained. In delaying until complete information is available, households reduce risks associated with migration and gain time needed for reciprocal resource sharing agreements to be negotiated.

Processes of urbanization, development, formal education and changing religious beliefs have all contributed to the decreasing practice of 'traditional' early warning systems and coping strategies. Because this knowledge is in many cases preserved as an oral tradition, the increasing absenteeism of youth from pastoral communities and the decreasing practice of 'traditional' knowledge pose a threat to the continued existence of this body of experience. This is cause for concern because the number of emergency responses available to communities has been reduced. Conditions that exist today, particularly access to relief food or other resources supplied by the government or external agencies, may change in the future. Likewise, climactic or other conditions may improve or deteriorate. Given these uncertainties, it is important that these communities have as many choices as possible to employ in their overall survival and livelihood strategies. It is important therefore to preserve these practices in some form.

Some of the current development strategies employed in the region appear to be at odds with traditional practices, limiting the physical and social resources available to pastoral communities in pursuing their livelihoods. Formal education reduces available labor pools and restricts opportunities for vocational training. Administrative chiefs appointed by the government undermine traditional leadership, conflict management and resource management structures within communities. The reduced accountability of these appointed chiefs to communities vis-à-vis community elected officials may also result in development strategies that are detrimental to the long-term and emergency survival strategies of pastoralists in these areas. While formal education, local administrators, and other institutions are necessary, more thought should be given to increasing their capacity to support pastoralism and the strategies pastoralists employ.

This also means supporting interventions directed at pastoral livelihoods and promoting livestock markets.

Glossary of Selected Terms

<i>abba-olla</i>	.....	head of the olla i.e. household level group
<i>Adoles</i>	.....	the dry season following gu (syn: <i>Hagai</i>)
<i>Agay</i>	.....	the short rainy season (syn: <i>Deer</i>)
<i>ahad</i>	.....	referring to either Sunday, or the first year in the eight year cycle
<i>Ajuran</i>	.....	one of the five clans of Kenya's Northeastern Province
<i>Arba'a</i>	.....	referring to either Wednesday, or the fourth year in the eight year cycle
<i>bakaar</i>	.....	storage unit – either in the ground or a small structure above ground – for grains
<i>Birra</i>	.....	the dry season following deer (syn: <i>Oraheed</i>)
<i>bobba</i>	.....	leaving
<i>bok</i>	.....	flowering of acacia trees (syn: <i>obora</i>)
<i>boma</i>	.....	the fenced enclosure of a household
<i>bun</i>	.....	coffee prepared by frying beans in oil and mixing them into milk
<i>deer</i>	.....	the short rainy season (syn: <i>Agay</i>)
<i>dogdi</i>	.....	watering hole
<i>duhur</i>	.....	midday prayer
<i>funno</i>	.....	a form of divination involving a looped piece of rope
<i>furmaat</i>	.....	short, 'relief' rains that precede the major rain event (syn: <i>bufa</i>)
<i>galchum</i>	.....	returning
<i>Gan</i>	.....	the long rainy season (syn: <i>Gu</i>)
<i>Gare</i>	.....	one of the five clans of Kenya's Northeastern Province (syn: <i>Gurre</i>)
<i>Gu</i>	.....	the long rainy season (syn: <i>Gan</i>)
<i>gu-es</i>	.....	livestock group taken some distance from the <i>boma</i> for grazing or watering
<i>Gumaad</i>	.....	short, 'relief' rains that precede the major rain event (syn: <i>furmaat</i>)
<i>Gurre</i>	.....	a drink made from milk and coffee beans fried in oil
<i>Hagai</i>	.....	the short rainy season (syn: <i>Agay</i>)
<i>hama</i>	.....	watering hole
<i>holiis</i>	.....	midday prayer
<i>Isnin</i>	.....	referring to either Monday, or the second year in the eight year cycle
<i>jerki</i>	.....	the short, 'relief' rains that precede <i>Gu</i>
<i>Jim'al</i>	.....	referring to either Friday, or the sixth year in the eight year cycle (syn: <i>Gumaad</i>)
<i>Kamis</i>	.....	referring to either Thursday, or the fifth year in the eight year cycle
<i>kunn</i>	.....	long distance migration
<i>maghrib</i>	.....	evening prayer
<i>miiri</i>	.....	a thin layer of clouds observed in the night sky and an indicator of rain
<i>Muralle</i>	.....	one of the five clans of Kenya's Northeastern Province
<i>obora</i>	.....	flowering of acacia trees (syn: <i>bok</i>)
<i>obora deka</i>	.....	minor flowering event of the smaller acacia trees
<i>obora guda</i>	.....	major flowering event of the larger acacia trees
<i>Ogaden</i>	.....	one of the five clans of Kenya's Northeastern Province
<i>olla</i>	.....	household level group
<i>Oraheed</i>	.....	the dry season following deer (syn: <i>Birra</i>)
<i>raag</i>	.....	the gift of divination or 'seeing'
<i>robdoon</i>	.....	community gathering for prayer and discussion
<i>Salati</i>	.....	morning prayer
<i>Septi</i>	.....	referring to either Saturday, or the seventh year in the eight year cycle
<i>shoat</i>	.....	sheep or goat – these are often found together in herds
<i>Talatha</i>	.....	referring to either Tuesday, or the third year in the eight year cycle
<i>tik</i>	.....	grazing
<i>warr</i>	.....	livestock groups remaining close to the <i>boma</i> because of continued milk production or infirmity
<i>xersi</i>	.....	call for alms (milk or grain) to be distributed among the needy people of a community by elders
<i>zakad</i>	obligatory giving of alms (Islam) as livestock, cash, etc.; also, first month of the year beginning with <i>gu</i> , designated for the practice of <i>zakad</i>

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I apologize for any omissions or misspellings.

Table of Contents

TABLE OF CONTENTS	7
INTRODUCTION	10
SEASONS	12
SIGNS OF THE MAJOR RAINS	12
STARS AND THE SEASONS.....	14
INDICATORS	16
MULTIYEAR CYCLES	17
ASTRAL BODIES.....	19
<i>Moon</i>	19
<i>Sun</i>	20
<i>Stars & Planets</i>	21
ATMOSPHERIC INDICATORS.....	23
<i>Daytime Clouds</i>	23
<i>Nighttime Clouds</i>	23
<i>Lightning</i>	24
FAUNA	25
<i>Patterns of Behavior</i>	25
<i>Human Populations</i>	26
<i>Domesticated Animals</i>	26
<i>Camel Specific Behavior</i>	28
<i>Cattle Specific Behavior</i>	28
<i>Shoat Specific Behavior</i>	29
<i>Chicken Behavior</i>	29
NON-DOMESTICATED ANIMALS	31
<i>Birds</i>	31
<i>Other</i>	34
FLORA.....	36
<i>Obora, Bok, 'Flowering of Acacia Trees'</i>	36
<i>Other Flora Indicators</i>	37
WATER SOURCES AS INDICATORS	38
PARANORMAL INDICATORS	39
<i>Sandal Dropping</i>	39
<i>Funno</i>	39
<i>Intestinology</i>	40
TRADITIONAL DROUGHT COPING STRATEGIES	41
MIGRATION.....	41
FOOD PRESERVATION	43
<i>Slaughtered Animals</i>	43
<i>Other Foods</i>	44
ALTERNATIVE FOODS.....	47
<i>Roots & Tubers</i>	47
<i>Stems, Bark & Sap</i>	47
<i>Leaves, Fruits & Seeds</i>	47
<i>Other Wild Foods</i>	47

<i>Bovine Blood</i>	47
<i>Today</i>	48
CARING FOR VULNERABLE ANIMALS	49
<i>Fodder</i>	49
<i>Milk Production</i>	50
<i>Water</i>	50
<i>Today</i>	50
CEREAL TRADE	52
<i>Case Study: Bambo (Mandera)</i>	52
<i>Case Study: Neboy (Mandera)</i>	53
COMMUNAL ANIMAL SLAUGHTERING PRACTICES	54
<i>Families Without Available Animals</i>	54
<i>Today</i>	55
<i>Reasons Cited for the Declining Practice</i>	55
FORMS OF COMMUNITY ACTION & ASSISTANCE	57
<i>Religious Practices – Robdoon, Zakad</i>	57
<i>Self Help – Chapsa and Traditional Courts</i>	57
<i>Social Obligation – Patronage, Orge (destocking), Irmansi (Ameis)</i>	58
<i>Community response – Xersi and Irb (Restocking)</i>	59
<i>Additional Support for Restocked Families (Ogaden)</i>	60
<i>Restocking of Agricultural Communities</i>	60
<i>Today</i>	61
TRADITIONAL KNOWLEDGE	62
<i>Knowledge vs. Information</i>	62
<i>Yesterday</i>	63
<i>Today</i>	63
<i>Tomorrow</i>	64
THE FUTURE OF PASTORALISM	65
<i>Formal classroom education</i>	65
<i>Development of water resources in wet season grazing areas</i>	66
<i>Administrative centers</i>	66
<i>Promoting agricultural activities outside riverine areas</i>	69
CONCLUSIONS	71
APPENDICES	73
APPENDIX 1: GURRE AND MURALLE INDICATOR CONFIDENCES	73
APPENDIX 2: KENYA-SOMALI ASTRAL CALENDAR SYSTEM	74
APPENDIX 3: CLAN ORAL HISTORIES	75
<i>Adjuran Oral History</i>	75
<i>Corner Tribes Oral History</i>	77
<i>Gurre Oral History</i>	79
<i>Muralle Oral History</i>	82
<i>Ogaden Oral History</i>	86
APPENDIX 4: THE NEW YEAR	89
APPENDIX 5: INTERVIEW PARTICIPANTS	90
<i>Ajuran Communities</i>	90
<i>Shebele Communities</i>	90
<i>Degodia Communities</i>	90

<i>Gabawein Communities</i>	91
<i>Gurre Communities</i>	91
<i>Muralle Communities</i>	92
<i>Ogaden Communities</i>	93

Introduction

Early in the last century, the pastoralist landscape was quite different; human and livestock populations were low, there were few permanent water sources, and no settlements to speak of. Trade was understandably limited under these conditions. Though common, drought was usually a localized event that lasted only for a single season. Traditional¹ strategies employed by pastoralists to mitigate the effects of drought evolved under these conditions.

The basis of these strategies is mobility, with pastoral populations moving from areas of resource depravity to areas where resources could be accessed. Lower populations and environmental stress allowed for faster pasture regeneration, livestock recovery and greater access to 'wild foods'. Problems arose when drought was widespread, lasted longer, or when movement was inhibited. Although the physical environment was in better condition than it is today, human mortality rates were higher over the course of major droughts.

Community assistance was not always capable of supporting larger populations and with widespread drought coping strategies were not enough. Even after rains, food insecurity continued until pasture became available and livestock production resumed. Livestock and people died; and in some cases, destitution followed. Restocking did occur, encouraged by faster animal recovery rates under less stressed environmental conditions, but not everywhere and not to everyone. Drought was difficult on livestock, but more so on people.

Times have changed. Populations and the number of permanent settlements and watering points continue to grow as 'development' takes its course. In some ways, growth in the number of administrative centers has helped pastoralists, providing access to consumer markets and allowing the trade of livestock for grain and other goods. It has also enabled people in the region to gain greater recognition in their relief needs in times of emergency. The combination of these factors has contributed to improving the food security and the short-term survival of people in the region in drought. What has not changed for the long-term survival of pastoralism is the need for mobility and access to livestock inputs.

Greater human and livestock populations mean that the resources available to each are limited. Communities expressed that this has led to a general decline in the constitution of livestock in the region. Increasing incorporation into the market economy means greater cash-based needs on the part of pastoralist communities and further stress on limited household cash resources.² Growing numbers of administrative centers further restrict pastoralist access to livestock inputs, increasing the vulnerability of pastoralism with drought. The latter is as much the result of shortsighted development strategies as it is a result of population growth. Reduced resource access has led to higher rates of livestock mortality in droughts. Decreasing survival rates of livestock can be translated into increasing rates of livestock destitution and the loss of livelihoods in these circumstances.

Is increasing destitution a growing trend because pastoralism is becoming less viable or is it the result of a decade of bad luck? The answer is probably a bit of both. Traditional practices of pasture and resource management are increasingly impacted by the development of administrative centers and superfluous (from

¹ The word 'traditional' is used here and throughout the paper for lack of an easily defined alternative. The word traditional implies a long-standing practice of body of knowledge. In reality both knowledge and practices are constantly evolving. Certainly, there are some threads of continuity in these strategies, but as conditions change and new information becomes available individuals and communities incorporate them into existing systems, eliminating less effective strategies in the process. Thus, the term traditional does a poor job of acknowledging the dynamic nature of this process.

² The problem is that pastoralist communities appear to be neither here, nor there, with regard to the market economy. While they face the increasing burden of cash needs (e.g. school fees, health costs) social pressure continues to retard the growth of livestock farming and diversification of investment. This attitude, the lack of infrastructure (including financial services), and political opposition significantly reduce the ability of pastoralists to market their livestock and gain from the developing market economy.

the perspective of grazing management) water sources.³ The past decade has also recorded higher incidence of drought, in '91-'92, '94, '99-'01, and the El Niño floods in '97, leading to unprecedented livestock destitution.

It is premature to say whether the increased frequency of drought over the past decade is an anomaly, or if climactic patterns are changing in response to global warming. In either case, the current development strategies and interventions in the Northeastern Province require some serious rethinking if they are to better support pastoral populations and avoid contributing to their long-run vulnerability. If the frequency of drought is increasing in the long-term, then pastoralist populations are in need of their mobility more than ever to reduce strain on the environment and conserve livestock inputs necessary for continued pastoral livelihoods.

Given increasing rates of livestock destitution, 'How will these populations support themselves?' To be certain, promoting agriculture in and around these centers is not the solution for any number of reasons. This is especially true if drought is on the rise. Agriculture requires large amounts of water. The additional stress on limited water resources through irrigation is likely to have a negative impact on ground and surface water supplies, to the detriment of all sectors. More importantly, agriculture is neither able to grow at similar rates to the population, nor sustainable outside riverine areas.

Because administrative centers impede access to livestock inputs in many ways, developing more centers without developing alternative sources of income does not help destitute pastoralists. Worse still, this pattern contributes significantly to the degradation of existing resources that support the livestock and hence, livelihoods. Another consideration is, 'What leadership structures within administrative centers best support pastoral populations?' These issues are relevant to the discussion of traditional early warning systems and coping strategies because they help define the contextual environment wherein early warning and coping strategies continue to evolve. Furthermore, they are the result of policy decisions that may shaped to either help or hinder pastoralist capacity to respond to other changes in their environments.

The best use of the semi-arid lands of the Northeastern Province is nomadic pastoralism. Acknowledging this, development and relief should serve to support rather than undermine pastoralism. The following pages attempt to document some of the traditional drought mitigation practices and hopefully provide direction for future relief and development initiatives within these communities.

³ These two are intrinsically related and contribute to the increased vulnerability of pastoralists to negative environmental events like drought. The case of water sources is a controversial one. In many instances, communities in and around administrative centers have and continue to push for increasing access to water sources, contributing matching funds, labor, and other resources to their development. In this respect, these communities are equally culpable for the degradation of livestock inputs that has resulted. However, there appears to be a growing recognition on the part of some communities that increasing access to water comes at high cost to the practice of pastoralism.

Seasons

To determine whether or not a community is experiencing drought, it is crucial to first know when rain is expected to arrive. In other words, if in normal years the short rains regularly begin in mid-September, and rains have not arrived by October, it is likely that the region will experience sub-normal rainfall.

Only after coming to the conclusion that drought is likely can pastoralists make good decisions upon their respective courses of action. **The consequence of acting prematurely is risk to livestock and food security.** Therefore, knowledge of seasons plays an important role in traditional drought early warning systems.

Table 1: Seasons

Season	Months of Shabele (CT)	Months of Gabawein (CT)	Months of Ogaden	Julian Calendar
Gu, Gan	Zakad Safarr Mouliid	Zakad Safarr Mouliid	Zakad Safarr Mouliid	Mid March Mid April Mid May
Hagai, Adoles <i>Short Rains</i> <i>Observations</i>	Malmadoone Boka-shoon <i>Ban-dambei*</i>	Mili-horet Mili-dahai <i>Mili-dambu</i>	Malmadoone <i>Jim 'a-dul Awal</i> <i>Jim 'a-dul Aqir</i>	Mid June Mid July <i>Mid August</i>
<i>Deer, Agay</i>	Sambuu Wagiris Soon	Shaban Hore* Shaban Dambei Soon	Rajap* Shab-aan Soon	Mid September Mid October Mid November
Oraheed, Birra, Jilal <i>Long Rains</i> <i>Observations</i>	Soon Fur Siditaal <i>Arfa</i>	Soon Fur Siditaal <i>Arfa</i>	Soon Fur Siditaal <i>Arfa</i>	Mid December Mid January <i>Mid February</i>

* Marks the first month of the new year.

The onset of the major rains is generally known by signs of clouds, wind, and the flowering of trees. These signs are compared to the expected dates for these seasons, as determined by the lunar months of Somali tradition or in position of stars. The time that these signs appear (or, in some cases do not appear) gives a strong indication as to the rains that might be expected for these seasons.

Rains might be expected to begin after the 60th day of the dry season. If the rains begin by the 70th day, as indicated by the position of the stars and/or moon, then the rains for the season to come are expected to be good and termed ‘soft-hearted’. If they commence after the 70th day, however, they are thought to be ‘hard-hearted’ and expected to be poor. By the 80th day, if they haven’t already, clouds must be observed if rain is to arrive. If it has not rained by the 90th day, drought is anticipated, as evidenced by the proverb, “A ninety year old man [season] cannot hold his water [rain]”. In other words, if rain does not fall from the sky by the 90th day, there is no rain to be found.

Signs of the Major Rains

Signs that the major rains are imminent include:

- The color of the sky takes on a deeper shade of blue from the hazy appearance of the dry season.
- The clouds begin to grow darker and are found lower to the ground
- The cold consistent winds found in the latter part of the dry season die, replaced by hot, humid and erratic winds termed *hunuf*.⁴ Wind of the rainy season is ‘circular’ and may come from any direction e.g. voices may be heard unexpectedly from the East, carried on the wind.
- The general direction of the winds should change from either North to South (*Hagai*) or vice versa (*Oraheed*).⁵
- The sun will shift from one horizon to the other. The sun is also expected to be very hot as the time of rain approaches, as indicated by the saying, “*Ilin lin karkaliin rob mil halan*”. ‘Unless the sun is very hot, it will not rain.’
- The birds are more active, nesting and singing in the trees.

Koh

The arrival of the rain season is announced by the arrival of *koh*. *Koh* is a wind event that happens in a single evening, blowing throughout the night. It is a conspicuous wind and is neither hot, cold, wet or dry; but has a ‘rumbling’ sound. People will acknowledge it, perhaps by saying, ‘Last night we had *koh*.’

Appropriately, *koh* is expected in the last month of the dry season. According to tradition, when it arrives early in the evening, the rains are a bit further off. If it arrives late in the night, rains should be expected soon. *Koh* brings a mild, cool breeze to replace the hot, arid winds of the dry season. It is said that following *koh*, people and animals sleep better and that livestock produces more milk during the ‘*koh* season’.

Obora (Bok) & Holiis

The flowering of acacia (*obora*) is expected towards the end of the dry season. This event is marked by the minor flowering of the smaller acacia (*obora deka*) that signals the small, ‘relief’ rains generally termed *furmaat*, or *bufa* (*jeer*) in *Adoles* and *qiita* in *Gan*; and the major flowering of the larger acacia (*obora guda*) accompanied by the growth of leaves and seedpods (*holiis*) that signal the arrival of the major rains.⁶ The rain that follows each *obora* is expected to remove the flowers. The period of each *obora* is about three weeks.

Hunuf

Hunuf is the warm, humid wind that immediately and necessarily precedes rain. Temperatures and humidity are expected to gradually rise over the period of a couple of weeks, the cold nights of the *koh* season fading away. These are replaced by *hunuf*. *Hunuf* is expected at the time of *kaldambow* (*kaldambowki*), ‘last drinks at the watering point,’ during the third moon of the dry season. Even the arrival of *furmaat* or *bufa* should bring some *hunuf*.

Miiri

Miiri is the thin layer of clouds observed in the night sky, in the lunar month before the major rains. *Miiri* of *Gan* (*Gu*) comes from the north, while *Miiri* of *Agay* (*Deer*) comes from the south.

⁴ ‘From the East, you begin to hear the voices of people carried on the wind when you don’t expect to.’

⁵ In *Gu* and *Hagai*, winds are expected to blow from the South. In *Deer* and *Oraheed*, they are expected to blow from the North. The direction of the wind reverses at the end of *Hagai* and *Oraheed*.

⁶ The Gurre elders of one community indicated a third *obora* between the minor and major *obora*, which they termed *Obora Iidu* as the male goat is expected to go into heat for at least one night during this period.

Deroy

The long line of clouds that extends from North to South along the eastern sky and observed at dawn is termed *deroy*. *Deroy* is considered to be a certain sign that the rains have arrived.

Koro-guet, “The Bell of Gu”

These are the small, black ‘doves’ that migrate from the South about two weeks before *Gu*.

Stars and the Seasons

Torbaan

Torbaan is the most conspicuous of the constellations for marking the changes in seasons. ‘Whoever does not know the counting of days, look to *Torbaan*.’ When the first two stars of the constellation have set at the time of Morning Prayer, then the short ‘relief’ rains of *Gu*, termed *jerki*, should have arrived.⁷ It is said of this time that the ‘first two feet of the cow have gone into the mud’. If these relief rains are strong i.e. lasting three weeks or more, then the season is expected to be good. If these are weak i.e. lasting only a week or less, then *Gu* is expected to be poor. If by the time the third and fourth stars have also set and there is no rain, then drought is anticipated. The setting of the first four stars of *Torbaan* at the time of Morning Prayer marks the beginning of *Gu*.⁸

For *Deer*, it is the rising of these four stars at the time of Morning Prayer that marks the season. This is preceded by the star *Lekor*⁹, expected around the 60th day of the dry season, *Hagai*. This is the time that the small rains, *jeer*, might be expected. If *jeer* is received at this time, the *Deer* rains are likely to be good. As the 70th day arrives, the first two stars of *Torbaan* should be visible in the morning and a second *jeer* might be expected to arrive. All four stars should have risen by the 80th day, marking the anticipated arrival date of the major rain. This time is described as “*Da mer mathow dow majook*,” ‘[when] the black donkey will never stay at watering points,’ meaning that the time for ferrying water has finished.

Derir, ‘Arcuturus (Boötes Constellation)

Derir follows the seven stars of *Torbaan* from the East. When *Derir* sets, the rivers are expected to be full. This is recalled by the saying, “*Derir dahali daba dis dooh la madego*,” ‘When *derir* sets, don’t stay in the valley.’ These words imply that there will be flooding in the valleys by this time because of the continued rains.

Busan, Urur, ‘Orion Constellation’

Busan rising in the morning marks the conclusion of *Gu* and the beginning of the dry season *Hagai*.

⁷ This is the time when sorghum or, with good rain, maize would normally be planted. However, in recent years because the major rains have failed, many people are waiting until the major rains have been confirmed to plant – especially in the low-lying areas, which are more vulnerable to drought. (Hilly areas receive greater run-off)

⁸ The first two stars of *Torbaan* set in late March 2001, the second two set about 16 days later. For observations made at 5:30am (Morning Prayer) this is 26 March, 2001. Using the new moon, *Gu* should have started in mid March.

⁹ *Lekor* appears in the Northeast. It may be Altarf, Alphar, or Procyon, based on the information provided.

Busan seen setting from beneath the belly of the cows as they are being milked in the early evening is an indication that *Deer* has arrived.

When *Urur* sets, early in the morning, after the conclusion of the *Deer* rains, a smaller rain is expected. *Urur* is said to mark the second part of the *Deer* season. If it is observed rising and rain has not been received, then there may be drought.

Afagal, ‘Aldebaran’ (Constellation Taurus)¹⁰

Afagal marks the end of *Gu* and the beginning of *Hagai* about a week after it rises over the eastern horizon at the time of the Morning Prayer. From this time, the days of *Hagai* are counted in anticipation of *Deer*. It is said that when this star rises, animals with milk will have finished producing and male camels will run from females.

Sadeen, ‘Al Niyat, Antares, and Tau Sco’ (Constellation Scorpius)

Sadeen marks the end of *Hagai* and therefore the beginning of *Deer*. *Sadeen* is the ‘back’ of the constellation Scorpius

Warjину, ‘Constellation Crux’, ‘The Southern Cross’ (Two stars of the second quadrant)

If *Warjину* has set before sunset, and there has been no rain, then it is likely to indicate that the *Deer* rains have failed.

Wadoon Goy, ‘Arturus’ (Constellation of Boötes)¹¹

This star is said to ‘stop the drawing of the water from the wells,’ because the rains of *Gu* are expected to have arrived when it rises in the early evening.¹² If *Wadon Goy* and six of the seven stars of *Torban* are seen to set in the early morning, followed by the setting of *Orion* in the early evening, and there has been no rain, then *Gu* is thought to have failed.¹³

“The Camel”

When the camel is seen to face downwards as it sets, *Gu* is known to have arrived. The Camel is a dark space delineated by the lighter area of the Milky Way Galaxy. *Wadoon Goy* lies along the neck and head of this sitting camel.

¹⁰ This star may in fact be *Rigel* of the *Constellation Orion*

¹¹ Boötes, the Herdsmen. ‘In Arab mythology, Boötes herded the flock of circumpolar stars.’

¹² *Wadoon Goy* rises ‘at nightfall’ in the late April (April 21, 2001 – 6:50pm)

¹³ All of *Torbaan* with the exception of the last star sets in early May (1 May, 2001 – 5:30am) while *Wadoon Goy* sets in mid may (10 May, 2001 – 5:30am), about 5 days before *Orion* (15 May, 2001 – 7:30am)

Indicators

Indicators may roughly be divided into two categories, the observed behavior of animals and plants in response to changes in meteorological conditions and cycles that correspond to observed longer-term weather patterns. The movement of astral bodies including the sun, moon, planets and stars mark the cycles of the latter. The following table lists the various indicators and their relative strengths as presented by communities.¹⁴

Table 2: Indicator Rankings

STRENGTH ¹⁵	INDICATOR	CONFIDENCE
1	Bararato (Unidentified Bird)	78%
2	Cattle (Late Hagai)	72%
3	Camel (Late Oreheed)	68%
4	Deroy (Morning Clouds)	83%
5	Obora (Heavy Rain)	48%
6	Moon & Sun	45%
7	River Daua	85%
8	Sololeya (Guinea Fowl)	65%
9	Lakaam (Bustard)	55%
9	Raha, Rach (Frogs)	55%
9	Tuqa-Biifa	55%
12	Cattle (Early)	100%
12	Dubeis	100%
14	<i>Miiri</i> of Birra	90%
14	Uldude	90%
16	Chickens	70%
16	Night Weather	70%
18	Koh (Wind)	50%
19	<i>Miiri</i> of Adoles	30%
19	Stars	30%
19	Tololia	30%
22	Bees	20%
22	Gonduleis	20%
22	Mot	20%
22	Tuqa	20%
26	<i>Funno</i>	10%
27	Koro-Guet	0%

¹⁴ Asking groups to use zero to ten stones to reflect their confidence in the indicators they presented obtained values for levels of confidence. Ten was said to represent absolute certainty that the observation of an indicator would be followed by either rain or drought, whereas one stone was said to represent no relationship between the observation of an indicator and the weather patterns that followed. (Ten = 100%)

¹⁵ The 'Strength' of each indicator was determined weighting each confidence value by the number of communities that introduced it as a drought indicator. Thus, even though some indicators may have a higher average confidence given, their strength as drought indicators is lower because they were not widely employed. The logic behind this distinction is that indicators with wider application and familiarity are likely to be stronger indicators.

Multiyear Cycles

Until recently, multiyear cycles of drought and rain were regarded as a strong indication of the weather that might be anticipated in a given year. These cycles represented longer-term weather patterns in the region as observed over past centuries.

It is reasonable to accept that these long-term meteorological patterns have existed in the past. Global and local weather system are complex, influenced by any number of physical events and properties, including the velocity of the earth relative to the sun and moon, the angle of inclination of the earth rotating on its axis, solar radiation, and terrestrial absorption rates. All of these variables are thought to have cycles of their own e.g. the earth orbits the sun every 365 and ¼ days. Indeed, the earth's velocity and inclination are responsible for the periods of the different seasons observed each year. As an example of longer-term cycles, fluctuations in ocean temperatures off the coast of the western Americas have been observed at regular multiyear intervals; decreases in ocean temperatures resulting in above average precipitation for these years.¹⁶

Likewise then, traditional Kenya-Somali cycles of drought may have merit. The cycles presented as drought indicators today are a culmination of centuries of observation passed through oral tradition. Given the complexity of weather systems, these cycles should not be considered as precise instruments for predicting years of drought, but instead, rough estimates. The most commonly cited indicator for drought is the cycle of eight years i.e. every eighth year is anticipated to be drought.

Other observed cycles are fifteen and fifty years¹⁷. All of these are based on a series of seven years, each assigned to a day of the week, and each attributed with its own particular weather patterns. Most communities have similar observations for these seven years. (see Appendix: Multiyear Cycles) The following table is an approximate summary of the different community traditions recorded.

Table 3: Anticipated Climates in the Eight-Year Cycle

YEAR	TRANSLATION	EXPECTED WEATHER CONDITIONS
<i>Ahad</i>	Sunday	<i>Deer</i> Failure, Good <i>Gu</i> (Wajir – good rains)
<i>Isnin</i>	Monday	Normal – Good
<i>Talatha</i>	Tuesday	Normal, Disease for both Human & Livestock
<i>Arba'a</i>	Wednesday	Dry (Below Average)
<i>Kamis</i> ¹⁸	Thursday	Normal
<i>Jim'al, Gumaad</i> ¹⁹	Friday	Dry – Normal
<i>Septi</i>	Saturday	Drought

In determining the validity of these traditional perceptions, drought could realistically be anticipated every seven to nine years. Furthermore, drought is a local phenomenon and may not be reflected in mean rainfall records for the region as a whole. A better record for comparison might be the oral histories of the communities themselves.

Septi (Saturday) is traditionally a year of drought. The years 1959, 1966, 1973, 1980, 1987, 1994, and 2001, are all Septi years. With the exception of 1966, all of these years have drought recorded in at least

¹⁶ This is commonly known as *El Niño* and until the past decade roughly followed a multi-year cycle.

¹⁷ Elders from the Ajuran community cited 8, 15, and 30 year cycles, with greater certainty and severity attached to droughts in the 15th and 30th years.

¹⁸ *Gare* community view *Kamis* as a year of bad omen, attributing either war, disease, pestilence, or drought to it. This appears substantiated for their community in reviewing their local calendar.

¹⁹ *Gumaad* (Friday) is usually heavy rains for long rains (*Gan*) but poor short rains (*Agai*) and therefore malaria. Usually called *Gumaad* because of long rains or malaria.

one of the oral histories related by communities. (see *Appendix 3: Oral Histories*) In every case, drought falls in the year prior to, or following a Septi year.

The cycles of fifteen and fifty years by definition, *Septi* years. (see Figure: *Fifty and Fifteen Year Cycles*)

Figure 1: *Septi* of Fifty and Fifteen

<i>SEPTI</i> OF FIFTY:	7	x	7	+	1	= 50
			<small>(yrs. per series)</small>		<small>(following year)</small>	
<i>SEPTI</i> OF FIFTEEN:	2	x	7	+	1	= 15

The droughts of 15 and 50 year cycles are perceived to be more certain and severe, with the 50-year drought being the worst. It is said that, “*Dachiin saddedi dar indubat. Ta kudani-shanitifi ta shantama dar indubatu*” (Gurre) ‘The cycle of 8 can lie, but the 15th and the 50th are certain.’

Septi of 2001 is given as a drought of the 50-year cycle.²⁰ If this is the case, then 1952 should also be a year of exceptional drought. *Septi Shushub* (Corner Tribes) and *Septi bun* (Murale) indicated drought in this year. Ogaden elders noted drought in 1951, *Abarta Jim’a*.²¹ (see *Appendix 3: Clan Oral Histories*)

Pastoral communities have observed with alarm the growing frequency of drought. The erratic weather patterns of the last decade have led many to conclude that traditional drought cycles no longer accurately anticipate drought. This appears to be part of a greater global shift in weather patterns and is likely the result of global warming.

²⁰ One group of Ogaden elders pointed out that the year 2000 is the 50th year following *Abarta Jim’a*, 1951.

²¹ The drought *Chinn Tite Guracha*, 1897, is considered by some historians to be the worst drought in ‘Western’ records of East Africa. This is about 100 years (2x50) before the current *Septi* drought.

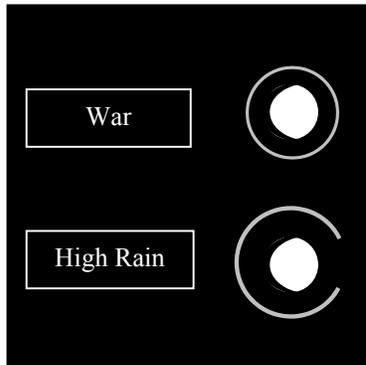
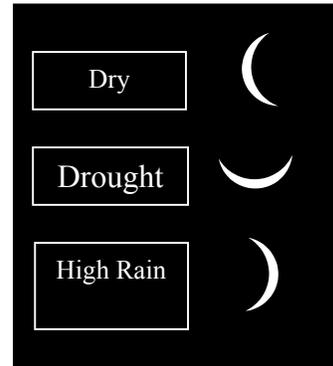
Astral Bodies

Moon

The *Zakaad* moon and the moon of the last month of the dry season are thought to give an indication of the events of the season to come. Three observations are generally made. The first is the crescent of the new moon; the second, rings that appear around the moon and occasionally the sun; and third, the particular star that rises with the new moon. Observations made with the *Zakaad* moon apply to the year as a whole (Degodia). Moon signs are accorded very little confidence in predicting drought.

Crescent of the New Moon

If, when the new moon rises, the waxing crescent is directed to the north (i.e. left) (translated as a pot pouring milk) then the coming season is hoped to bring good rains. If on the other hand, it is directed to the south (i.e. right) then the coming season is thought to be either dry, with little rains (*Degodia*), or war (*Gurre*).²² In the case of war, the direction that the moon turns as it transitions from waning to waxing indicates the direction of conflict. Lastly, if the crescent of the new moon is centered, as though it was a pot on the fire, the coming season may be drought. If the new moon is darker than usual, it is a sign of disease for either human or livestock populations. (see diagram)



Karo ‘The Moon of Good Harvest’

A circle is observed around the moon has one of two meanings. Provided there is a ‘gate’ in the circle, symbolizing a dam to be filled, the season to come is hoped to bring good rain and a good harvest. In some traditions, the direction of the ‘gate’ indicates where rains will be found. If, however, there is no break in the circle, people may anticipate conflict in the region. The ring representing war, is described as being much closer to the moon than that for *Karo*. The radius of the circle is said by some to give an indication of the

magnitude of the anticipated conditions.

Stars Rising with the New Moon

Traditionally, there are 28 stars identified with the new moon. These stars are divided into four groups of seven. Each group of seven is associated with a particular season: *Gan*, *Adoles*, *Agai*, and *Birra*; and those groups subdivided into the seven days of the week: *Ahad*, *Isnin*, *Talatha*, *Arba’a*, *Kamis*, *Jim’a*, and *Septi*. The particular star that rises with the new moon identifies the conditions that may be experienced throughout that month. In the case of rain or drought, the *Zakaad* moon, or the new moon in the last month of the dry season, is observed. Each night a different star appears with the moon as it rises.²³

²² Some Muraale elders suggested that if it is directed to either side, rains will be good.

²³ The positions of the stars in the night sky are determined by the speed of the earth’s rotation. Although the stars are also moving, the distances between the earth and these bodies is so great that their relative position changes are negligible. The moon on the other hand, orbits the earth and is relatively close, this additional velocity means that the moon does not appear at the same time every night. In fact, the moon rises about 58 minutes later each night, while stars rise about 4 minutes earlier. As they are moving in opposite directions relative to one another, the moon will ‘pass’ the stars falling in its path in order. Thus,

Through the course of a 30 day month, the first 28 nights will be identified with a different star in the series. The 29th night, the moon will rise with the ‘lead’ star (i.e. the star that rose with the moon on the first night). On the 28th and 29th nights the moon has waxed to virtual darkness and the stars on these nights are not observed. On the 30th night, the new moon is seen rising with the second star in the series. In this way, the new moon is identified with the next star in the series as the months progress. Thus, each month and therefore year (based on the *Zakaad* moon), is identified with a different star and the particular characteristics of that star. Kenya-Somali tradition assigns particular attributes to each of the 28 stars, including rain, health, and prosperity. Considering the importance of rain to livestock health and its relationship to human health and prosperity, it seems reasonable to assert that rain is the determinant factor. If then, these rain attributes are the result of observations over the course of centuries (assuming relatively constant meteorological patterns) imbedded in this system is a wealth of information and historical record.²⁴

(see *Appendix: Kenya-Somali Astral System*)

Full Moon

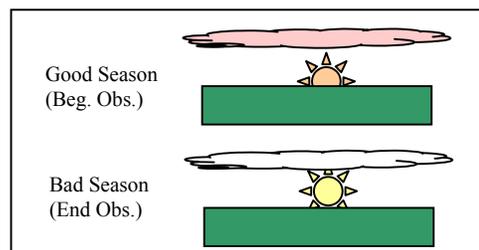
Traditionally, observations are also made using the full moon. If the full moon rises with clouds in the last month of the dry season, it is interpreted as a sign of rain to come. This is likely related to the presence of *miiri* (i.e. a thin layer of clouds observed at night). While the new moon is usually consulted for predictions of rain, in the past, the full moon was consulted for predictions in other areas of Kenya-Somali life.²⁵ (Degodia)

Sun

There are two signs observed with the sun. The first is the color of the sun and clouds as the sun rises and the second is solar eclipse. (Degodia)

Sun Color

In the second or third month of the dry season, the color of the sun gives an indication of the rains to come. If the sun and the light reflected off of the morning clouds on the horizon are perceived to be ‘red’, then a good season is expected to come. If, however, this light is white, poor rains are thought to follow.²⁶ This observation is made when the sun is $\frac{3}{4}$ up from the horizon until it has just cleared the horizon. (Degodia) (see *figure*)



Eclipse

A full or partial eclipse is generally regarded as a sign of difficulty elsewhere in the world. This may take the form of war or natural disaster.

it is possible for the moon to rise with a different star each night. If evenly spaced, the ‘distance’ between these stars is approximately 12 degrees, 50 minutes.

²⁴ This appears to be an 85 year cycle

²⁵ According to one elder, the *zakaad* that moon that just passed and the new moon that appeared on June 21st were born under Saturday. This moon is called *rajep*. A Saturday moon and Saturday star combine to indicate poor rainfall.

²⁶ This may be the result of increased humidity or particulates in the air to the east. When sunlight passes through the air and is reflected and/or refracted off of these, it produces a red color. This is more likely observed during the morning because the volume of air, and hence the opportunity for reflection/refraction is greater when the sun is on the horizon rather than higher in the sky.

Stars & Planets

The appearance or disappearance of particular stars in the night sky also marks traditional observations of rain or drought. Alternatively, the position of these stars relative to the moon or each other may serve the same purpose.

Torbaan, Tolthop, ‘Constellation Ursa Major’

Poems for Camels (Degodia)

- “*Hadas Dimir iyo dih qalayo yah dah osa gugi diin wakuderii diifu isagagur.*”
- “*Sadah Talatha (3 Tuesdays) ninki kamabat haka nisih oyo layyay*”

Bakalch, Markalhell, ‘Mercury (Planet)’

Appropriately, whenever Mercury appears in the night sky after a period of absence, it brings a message of the rains to come. If Mercury is absent for a period of 6 or 80 days, this is thought to be a good omen for the rains to come. It is said that ‘a six day absence finds a sixty year old man rejoicing.’

Unfortunately, Mercury seems to bring more bad news than good. Absences of 60, 90, or 180 days are thought to bring drought, each progressively worse. Of an absence of 60 days, it is said ‘a six year old he-camel will not be able to stand with a load.’²⁷ This is an austere statement because a six-year-old camel is considered to be in its prime.

It is also said that ‘camels should be grazed until *Markalhell (Bakalch)* falls’. When this planet appears in the East, it is thought to be the ‘star of cattle’. At this time, a breeze is expected from the East that will bring rain. Cattle then stand facing east and *Markalhell (Bakalch)* seen rising. (Degodia)

Gaal Miirias, ‘Venus’

Prior to *Agay (Deer)* Venus will be seen in the eastern morning sky. With each morning, it will be found lower in the sky as the sun rises. If Venus ‘sets’ quickly (i.e. when the sun rises, Venus has already dropped below the horizon) then heavy rains are anticipated. If on the other hand Venus has not set by the 70th day of *Adoles (Birra)*, then ‘there will be no milk and people will eat grain’ (i.e. poor *Agay* rains).

Busan (Orion)

When Orion approaches the full moon (i.e. 13th to 15th night following the new moon) in the early evening and during the last two months of *Oraheed (Birra)*, poor rains have traditionally been observed for the *Gu* season that follows.²⁸ (Gurre)

Likewise, if this happens for two consecutive lunar months, on a Monday night (*Talatha* night), then tribal clash or poor rains are expected in the near future.

²⁷ Gurre tradition substitutes this with a 70-day absence, stating ‘a camel of seven years will sit [die].’

²⁸ The distance of separation between the six stars of Orion and the moon on these nights will be less than the diameter of the moon.

Deriir, Wadan Goy, ‘Arcturus’ (Boötes Constellation)

If Arcturus appears with the moon on the 9th, 10th, or 11th of the last month of the dry season, good rains have traditionally been observed for the season that follows.

Also, if Arcturus is observed as being bright in the early morning sky of *Adoles (Hagai)*, then good rains are anticipated for *Deer*. Alternatively, if it is weak, poor rains are expected. Similarly, if it disappears altogether, no rain might come. This observation is made when the ‘flowers of *obora deka* fall to the ground’ (i.e. mid to late August). Arcturus is expected to be 15-20 degrees above the horizon at this time.²⁹ (Gurre)

Afagal, ‘Aldebaran’ (Constellation Taurus)

In the month of *Soon Fur*, if *Afagal* is seen setting in the west, while *Dahai*³⁰ is seen rising in the east at the time of Morning Prayer, then the rains are expected to be good. (Corner Tribe)

If ‘*Afagal* and the second night of darkness meet,’ then good rains are anticipated. This observation is made early in the morning of the 17th day following the new moon of *Malmadoone*.

Lukey Constellation³¹, ‘Southern Cross Constellation’ (Constellation Crux)

If both of these stars are observed to shine very brightly as ‘The Sitting Camel’ rises on the horizon, then good rains are expected. If, however, the smaller star cannot be seen and the other is very dim, poor rains are expected. This observation will be made between midnight and two in the morning. (see *footnote of Deriir* on ‘brightness’)

²⁹ It could be speculated that the ‘brightness’ of Arcturus is dependant upon the humidity and air pressure. Increased water content in the air and/or air density (air pressure) might reduce the apparent brightness of the star to an observer on the ground. The effects of both are likely to be increased when this star is lower on the horizon, as there is more air between the star and observer at that time.

³⁰ Unknown identification

³¹ *Lukey* is composed of the two lower right stars of the Southern Cross. The larger of the two stars is on the left (lower). These two stars are adjacent to the ‘dark space’ that forms ‘The Sitting Camel’ in the Somali night sky. The ‘head of the camel looks at the larger star of *Lukey*’.

Atmospheric Indicators

Observations based on atmospheric conditions are usually positive indicators for rain. That is to say, these are cloud formations or winds that are known to precede rain. In the event that these indicators fail to appear altogether, drought is suspected. The indicators presented here are in addition to the atmospheric changes that traditionally accompany the changes in seasons. (see *Seasons*)

Daytime Clouds

Clouds during the days of the dry season play an important role in helping to determine whether the coming wet season can be expected to hold rain. The rule of thumb is if heavy cloud cover is observed through *Oraheed* [*Birra*] then the rains of *Gu* will be normal or good. If *Oraheed* is marked by clear skies however, then *Gu* is likely to have poor rains.

In the case of *Hagai* [*Adoles*], the skies are expected to be clear for a good *Deer* [*Agay*] and cloudy when *Deer* will be poor. This is recognized in the proverb, “*Gannii aduun ol, ageeti dumens san olti.*” ‘*Gan* with the sun is a failure, *Hagai* with clouds is also a failure.’ (Gurre) Alternatively, “*Ganna oolu aduun beekan; agay ooltu, uririn beekan.*” ‘*Gan* that fails is known by the sun; cloudy *Agay* also fails.’ (Gurre)

Afternoon Clouds

On the lower steps of the Ethiopian highlands near Banissa (Mandera), a mist is observed in the early months of *Hagai*. If this mist clears in the afternoon and, instead of separate clouds, a continuous cloud is seen extending from East to North, the heavy rains are expected for *Deer*. If in the afternoon, this disappears and instead of separate clouds there is a continuous cloud from East to North, the prediction is heavy rains. If separate clouds are seen instead, drought is anticipated. (Gurre)

Morning Clouds

In the morning, three thin, wispy lines of reddish clouds (i.e. high pressure) extending from the east to the other cardinal directions is a sign of civil war or bloodshed in Kenya, Somalia, or Ethiopia. As these lines converge in the east, they will ‘turn’ in the direction of the country that will experience civil war. These clouds will be seen in an otherwise clear sky. If this is also seen at sunset, the sign is confirmed.³² (Degodia)

Deroy (Deri)

The rains of both *Gu* and *Deer* are marked by *deroy*, a thin line of clouds in the east that appears at sunrise. It is said that ‘a cow that sees *deri* will not die’ i.e. if a cow has lived long enough to see *deri* it will survive until the rains that are very soon to come. (Gurre)

(see also *Seasons*)

Nighttime Clouds

In general, clouds at night are an indication of rain to come. Regardless of cloud cover seen during the day, if no clouds are observed at night, the chance of rain is said to be unlikely. Night clouds are expected to appear with the third moon of the dry season.

³² This sign was observed directed toward Somalia for a five-year period, prior to the collapse in the early ‘90s. It was last observed in 1999.

Bijirt

As the moon rises, long lines of clouds oriented from North to South may be observed moving East. This is a good sign of rain for both *Gu* and *Deer*. (Corner Tribes)

Miiri

A thin layer of clouds in the night sky is known as *miiri*. Although *miiri* is seen as a good indicator of rains for both *Gu* and *Deer*, the *miiri* of *Oraheed*, preceding the *Gu* rain, is regarded as near certainty, while those of *Hagai* are accorded less weight. Hence the proverbs, '*Miirin birra tiifi Bilawi alkan garan len indaroft*;' *Miiri of Birra* [*Oraheed*] is the sharpening of a knife at night i.e. in the same way that a knife sharpened at night indicates the slaughter of animals the following morning, so the sight of *Miiri* in *Oraheed* means that rains of *Gu* [*Gann*] will come. On the other hand, '*Miiri of Adoles* [*Hagai*] is a sky with decoration' i.e. may very well mean nothing for the rains of *Deer* [*Agay*] to come. (Gurre) (see also *Seasons*)

Lightning

Around the rainy seasons, 'lightning from the eastern sky at night means morning rain.' This sign is regarded with high confidence. If lightning is seen at night, animals are unlikely to be sent to watering points the following morning. However, if there are many thunderstorms through the dry season, it is said that the rainy season to come is likely to be poor.

Fauna

Unless otherwise noted, these patterns of behavior serve as indications of either drought or rain when observed around the third month of the dry season, in the weeks preceding the date when precipitation is normally expected to occur. This time is termed *sodom lonleis*, 'the thirty days that make cattle weak', when resources are scarce and animals are more likely to suffer. If this behavior is observed over a period of weeks and is confirmed by other indicators, some pastoralists indicated that they would move their herds away from watering areas.³³ This movement would conserve pasture closer to permanent water points for later periods when animals are weaker and may not be able to travel longer distances between available pasture and water points.

Patterns of Behavior

The indicators presented by animals may be divided four categories; behavior related to animal reproduction; practical behavior in response to changes, or anticipated changes, in the physical environment caused by rain; seasonal behavior that occurs irrespective of rain; and *other* behavior.

Reproductive Behavior

Animals have their own life cycles and coping strategies that are intrinsically related to cycles of rain. Animals have evolved (or been created) to reproduce when environmental conditions best favor the survival of their offspring. For most, this coincides with the arrival of rain, as water is usually the limiting factor in semi-arid regions. Rain encourages plant growth, providing better quality foraging and hence milk production for grazing mammals.³⁴ Rain also means increased insect populations, which is good for nesting birds. If rain marks the best time for reproduction, then it should be no surprise that animals are sensitive to changes in climate that indicate rain is likely to occur. For animals with longer gestation periods, a similar statement can be made i.e. that once it is known that rain will arrive and with it adequate grazing to support pregnant cows, that animals conceive.

Many of the strongest indicators for rains appear to be animal behavior that is related to reproduction e.g. the nesting of birds. By extension, the absence of these behaviors in the month before the rain season is an indicator of drought.

Bulls: Rain Prediction or Mating Rituals?

Indicators such as bulls acting jovially or playfully are likely to be signals to other bovine that they are ready and/or willing to mate, rather than meant as signs to their human managers of rain to come. For example, a bull may be observed playfully applying its horns to the water trough (breaking those made of mud) an act which is taken to communicate that the cattle will have no more need of the water trough because of the rains that are sure to come. What is more likely is that younger bulls are demonstrating their prowess in the greater social context of mating. It seems reasonable to assume that this behavior is precipitated by an instinctive recognition of

Practical Behavior

Animals may also indicate rain through behavior other than reproduction. If rain generally occurs in the highlands before the lowlands, then rivers and water tables are likely to rise before the arrival of rain in the

³³ This may be as far as two and half days travel (50 km)

³⁴ Similarly, it provides predators with easier prey in offspring.

lowlands. Thus, if ants are seen moving en masse, or snakes observed climbing trees to avoid rising water levels, it seems logical to conclude that rain is on the way. On that note, other animals may initiate seasonal migration to enjoy the conditions in one area or another based on rainfall patterns.

What is unlikely is that animal behavior predicts drought per se. **Rather, it is the absence of 'normal' behavior associated with rain that signals a season of below average rainfall.** With prolonged drought conditions in the region, might expect traditional drought indicators based on animal behavior to diminish. It seems reasonable to conjecture that as these animals accept and/or adjust to more difficult environment the need to pro-create supersedes an instinctive reluctance to initiate conception given poor environmental circumstances, thereby altering traditional patterns of behavior and anticipated indications of drought.

Human Populations

Elders note that the levels of anxiety within a community are reflected in the play activities of children. They therefore included the behavior of children in the list of indicators for drought, rain, or war,³⁵ as they convey community-wide attitudes, confirming other observations and suspicions.

- Young children playing at cooking or taking a meal is cited as examples of increasing anxiety over the possibility of drought.
- On the other hand, young children playing at herding, making fences and dividing imaginary herds amongst themselves is considered an indication of rain.
- Likewise, young children singing songs about rain or prosperity are signs of the hope for a good season to come.
- Children playing with imaginary guns are said to be a strong indication of the possibility of inter-community conflict in the near future.

These playtime activities on the part of children are attributed to the prevailing attitudes and conversations around the *boma* on the possibility of impending conflict or drought. Children were not accorded any subconscious awareness of atmospheric trends or future developments. If concerns about drought are not voiced in a community forum, these behaviors in children help to confirm individual suspicions and raise community dialogue.

Another observed behavior before rain failure among communities is that despite plenty of food available to households, through relief efforts or the previous season's production, people find that they are not satisfied after eating. This insatiable feeling may be a manifestation of concern for future food security; or may simply be part of the natural cycle in food security as the less productive dry season comes to a close and milk availability declines.

Domesticated Animals

Unsurprisingly, given the proximity and interaction with livestock, most of the indicators relating to drought come from the observed behavior of these animals, particularly camels and cattle. Also, because of this familiarity, these indicators are often cited as being the most reliable, and as such, most likely to precipitate pre-emptive drought mitigation action on the part of Kenya-Somali pastoralists.

³⁵ Because the effects of war are similar to those of drought i.e. loss of livestock, access to resources (pasture/water), and loss of human life, indicators of war were frequently included in lists for drought.

Bobba Behavior (Leaving the boma in the morning after milking)

- Camels and cattle will stand and make for pasture when the coming season is favorable.³⁶ With coming drought, they will return to sitting after milking and only reluctantly leave the confines of the *boma* when forced.

Galchuum Behavior (Returning to the boma in the evening)

- Cattle and shoats are eager to return to the *boma* in the evening when the coming season is favorable. With coming drought, cattle and shoats are unsettled and will disappear in pairs to the bush and are into the bush around sunset.³⁷ This sign is also observed in camels, later in the evening when they are expected to return to the *boma*.
- With coming drought, milk production declines despite adequate levels of fodder or pasture.

Dogdi Behavior (At the watering hole)

- With drought coming, livestock will move to watering points early in the day (prematurely), but having arrived will not take very much water, perhaps even feigning drinking, as if to conserve it for the coming months.³⁸
- Camels and cattle are quick to drink and leave water points when the coming season is good, happy to return to grazing. With coming drought, camels and cattle at water points appear very lazy, sitting, feigning drinking, and are reluctant to leave these points. This is considered to be a strong sign and has been the observed behavior since the El Niño rains, just prior to the current drought.

Tik Behavior (Grazing during the day)

- Livestock will move freely around the area, peacefully grazing, if the coming season is good. With coming drought, they will not graze much, as if in an effort to preserve pasture for the coming months.
- With coming drought, livestock is not satisfied after grazing.

Boma Behavior (In the boma)

- With coming drought, animals are restless in the *boma*, neither sleeping nor sitting. They may even escape from the enclosure in search of grazing.

Behavior at Other Times

- Livestock begins mating early when the coming season is good.³⁹ If this is not observed with the arrival of the rainy season, drought may be suspected.

³⁶ One group of *Ogaden* elders expressed the opposite i.e. that in a good season cattle will refuse to leave the *boma*

³⁷ One group of *Ogaden* elders said that this might be observed a couple of days after the onset of rains, indicating that these will be short lived, and the season dry.

³⁸ One group of *Degodia* elders indicated just the opposite (i.e. that when coming season that is good, the animals take very little water).

³⁹ In the case of goats, this was expressed as ‘females accept the mating of males’.

Camel Specific Behavior

Galchuum Behavior (Returning to the boma in the evening)

- With drought coming, female camels will stand and cross their rear legs, sometimes urinating on their thighs, on their return to the *boma* in the evening,⁴⁰ This signal encourages *kunn*, ‘long distance migration’.

Dogdi Behavior (At the watering hole)

- The mating calls of camel bulls (grunting) are heard when the coming season is good. This behavior is normally observed only during the wet season.

Tik Behavior (Grazing during the day)

- Steady grazing throughout the day is observed when the coming season is good. When drought is coming, camels prefer moving independently to being sedentary or grouped. They will and will often go missing in the bush.

Boma Behavior (In the boma)

- With drought coming, female camels urinate while sitting as if to express hopelessness for the future.
- Camels will be observed ‘yawning’ in the *boma* at night when the coming season is good.

Behavior at Other Times

- ‘Jovial’ camels indicate that the coming season is good.

Cattle Specific Behavior

Dogdi Behavior (At the watering hole)

- Cattle bulls are ‘playful’ when the coming season is good, perhaps even breaking watering troughs made of mud with their horns.
- With coming drought, cattle begin to eat dirty things such as rubbish and bones around watering points. This is observed early in the dry season.
- When the coming season is drought, cattle take excessive water at watering points and are reluctant to leave these areas.

Tik Behavior (Grazing during the day)

- Cattle are eager to return to the *boma*, perhaps even at noon, when the coming season is good.

⁴⁰ One group of *Gurre* elders indicated that if this behavior is instead observed as they make their way to pasture, the coming season is expected to be good. Another group of *Degodia* leaders indicated that this behavior is observed when the coming season is good.

Boma Behavior (In the boma)

- Cattle begin to shake their rear legs, as if in anticipation of mud being removed, when the coming season is good. This may also be observed during the day.
- Cattle vocalize from their throats through the night or call out while sleeping when the coming season is good. Perhaps they are having wet dreams.

Behavior at Other Times

- With drought coming, cattle will urinate and excrete while seated, as if to indicate that in the months to come they will not have the strength to stand for this exercise.
- With drought coming, cattle will ‘moan’ after milking as if to grieve the future and the loss of their children in the coming months. This plaintive vocalization is usually heard before milking.
- With drought coming, cows may refuse their calves from suckling.

Shoat Specific Behavior

Galchuum Behavior (Returning to the boma in the evening for milking)

- Arriving at the *boma*, shoats simply stand outside the fence when *furmaat*⁴¹ is expected.

Tik Behavior (Grazing during the day)

- Sheep will begin to nod off to sleep while they are standing when the coming season is good.
- *Giinai*, ‘shoats stop grazing and group’ around 11am when the *furmaat* is expected.
- Goats begin to eat stems rather than grass when the coming season is good.

Boma Behavior (In the boma)

- Goats place their hooves on the *boma* fence as if to keep from stepping in *chanchan*, ‘rain water mixed with feces’, when heavy rains are expected.
- Goats begin to look towards the sky and pant when the coming season is good.

Behavior at Other Times

- Male kids that are very young begin to make he-goat mating sounds when the *furmaat* is expected. This is considered to be a strong sign of *furmaat*.
- *Nuguli*, ‘weak animals’, begin to appear with ticks when rain is expected.⁴²

Chicken Behavior

- Roosters crowing from eight to eleven in the evening is heard when the coming season is good.
- Chicken hens that stay in the sun, sleeping and turning, for a three to four day period is a sign of rain expected to arrive about the fifth day.

⁴¹ *Furmaat (Jarki)* are the short ‘relief’ rains that appear about one month prior to the onset of the main rains. If *furmaat* are not received, drought may be suspected.

⁴² These ticks bring *ilgoof*, disease. This disease was described as being either one, a skin disease where the eyes became blocked, tearing, and death; or two, the loss of appetite and hair, blackening of the skin, excessive scratching, and death.

Non-Domesticated Animals

Birds

In general, birds are expected to be active, singing and nesting when the coming season will be good. The absence of this activity indicates the possibility of drought. Below are some additional observations made about some particular birds.

Agai-yoole, ‘The Bell of the Agai’

This bird is considered to be the harbinger of the short rains. It will alight on the *boma* fence towards the end of *Adoles*, indicating that *Agai* and rain should be expected to arrive in a couple of weeks.

Ahad, ‘Hawk’ and Eagles

Sightings of soaring hawks and eagles are regarded as good signs of rain. This behavior may be encouraged by updrafts that result when low-pressure systems (indicative of rain) enter push into the area. (Degodia)

Erki Kujuro, Bararato, ‘Bird of the Sky’

(see *Inset*)

Habas, Garagow, ‘Nightjar’

When drought is coming, this bird is heard singing very early in the morning (around 4am). If normal rains are expected however, it is heard in the early evening (around 10pm). This behavior is noted as you approach the rainy season and is expected to continue for a couple of weeks, at which time the *furmaat* should begin. If dew is also observed in the morning grass, the coming rains are anticipated to be shorter, as described by the proverb: “*Jibal garagow* singing in the morning and dews before the season shows a dry year to come.” (Degodia)

Although most communities would not speculate openly about the identity of *Erki Kujuro*, Adin Mohamed Yarso of Fincharo suggested that this bird is like *mololeia* (shrike) given the sound.

Erki Kujuro, Bararato, ‘Bird of the Sky’

Perhaps the most universal and highly regarded animal indicators of rain or drought is *Erki Kujuro* or *Bararato*. This bird is never seen, but its high-pitched call is heard late in the evening, high above the ground. Most communities agree that *Erki Kujuro* is likely a bird that may be regularly observed during the day¹, but as to which one can only be guessed.¹ Whatever its identity, *Erki Kujuro* is generally regarded as one of the best indicators provided by animals as to whether rain will be received or not. *Erki Kujuro* is heard to call in two ways. The first, for rain, is three long cries, followed by a series of short, staccato cries. The second, for drought is a truncated version, composed of only the first three cries. *Erki Kujuro* is described as a solitary bird that flies relatively quickly from horizon to horizon, though not necessarily always in the same direction. It is generally heard only once in any given evening and only towards the end of the dry season. Some communities stated that though they had expected to, they had not heard the call of *Erki Kujuro* over

Koke Gana, ‘The Bell of the Ghan’

This bird is considered to be the harbinger of the long rains. It will fly over in the last month of *Birra* with a whirring sound announcing the soon arrival of *Gan* rains. If it does not appear, drought is suspected.

The *Muraale* elders in Fino stated that *Erki Kujuro* was not heard, but can only be found high in the heavens. *Erki Kujuro*, it was said, calls to *shimbir lo-aad*, who in turn calls out at night and is heard by people below. *Shimbir lo-aad* was described as ‘the bird of the cow’, about the size of the crow. This is probably the egret.

Laba Juglei, ‘Heuglin’s Bustard’

When drought is expected, this bird makes the sound of maize being pounded, “juug... juug... juug...” followed by a high note. (Degodia)

Lakaam, Debit, ‘Bustard’

In the month preceding Lakaam will fly straight up, somersault with its tail spread wide, and glide down. Upon reaching the ground, it cries out. This behavior is noted to precede the formation of *deroy*, the early morning clouds that are certain to bring rain. This behavior concludes with the formation of *deroy*.

Cloud Sign

“**Chau...Chau...Chau... Li-Li-Li-Li-Li**”

War Sign (Crying/Mournful)

“**Chew**”

Lakaam also a second sign, about which is said ‘*Deblibuut, lakaam at iim*’, “A war is known to *lakaam*”. War is indicated by a mournful falling cry and may signal conflict anywhere that bombs are falling. This behavior was noted with the onset of fighting in both Somalia and Ethiopia and concluded with the war. This particular cry is also heard when

the full moon rises with the setting sun, but distinguished because it is only heard for one night. (Gurre)

Shimbir Loc-aad, ‘Egret’

This bird is generally regarded as a good sign of rain.

Sololeya, Digirin, ‘Guinea Fowl’

Guinea fowl are heard to call out during the night when the coming season is good. The various sounds have been translated to indicate rain is on its way. Other interpretations include “May God bring rain”, “My tail is in the mud”, and “Make me drink sour milk”. When the coming season is drought, *sololeya* is not heard.

Predictions of Rain

“*Eegeen jiiit*” - “My tail wets”

“*Do lo lon-yaat*” - “The gullies will flow”

“*Farik Farik Farik*” (sound of drinking)

Somalgaro

Normally staying deeper in the bush, this bird approaches human settlements at night, calling “*Somalgaroo... Somalgaroo...*” when rain is expected. If this repetitive cry is not heard, then the bird is thought to be further away and no rain is expected.

Hantalay, ‘Marabou Stork’

Storks are expected to stand in open spaces with wings outspread facing the wind when rain is expected. This may be a means of cooling themselves with the increasing humidity associated with the rains

Ul-dudei

This bird is described as a large black bird similar to the stork that makes a sound like the blades of a helicopter. When this bird is heard, it is thought to be a certain sign of rain.

Vogo

Communities along the Tana River describe this as a small black bird that follows the course of the river from its source, singing, ahead of the rains. This is an indication that rain is on its way.

Other

The indicators for drought observed in non-domesticated animals are predictably similar to those for domesticated animals. Communities described the general behavior of non-domesticated animals to be restless in the weeks prior to the onset of drought. Lions and hyenas are thought to be particularly active and aggressive during this time. Other animals, like frogs and bees, were mentioned in connection with specific behavior observed when rainfall occurs. Of the two behavior patterns, confidence was higher in that associated with positive indication of rain than that of rain failure. In the case of the latter, some communities suggested that more aggressive behavior by predatory animals could be attributed to the prolonged impact of recent, consecutive droughts rather than a precursor to future droughts.

Abesa, ‘Puff Adder’

If the puff adder is found climbing trees, it is an indication of rains in the near future. The puff adder is usually found along the ground. (Tana River)

Din-din, ‘Leopard Tortoise’

Tortoises are very rarely seen during drought. If a tortoise is known to live in a particular area, and is seen moving about, then it is thought to be a sign of rain (Ogaden)

Katalan, ‘crickets’

When crickets are heard chirping throughout the night during the dry season, it is a sign of rain to come. (Gurre)

Gandules, ‘Black Army Ants’

Black ants have been observed marching on termites (white ants) when rain approaches. (Gurre)

Ida-roba

The behavior of this insect is said to mimic a helicopter that spirals downward to the ground. As it almost comes in contact with the ground, *ida-roba* lifts off, repeating the process. This behavior is not observed during times of drought and is likely to be followed shortly by rain as it is often accompanied by the darkening of clouds. (Ajurán)

Masa Lugolei, ‘Monitor Lizard’

The monitor lizard is usually found in trees along the Tana River route. In good seasons, it is observed midway up the tree, looking towards the ground. However, if it climbs to the top of the tree and faces the sky, drought is expected. (Ogaden)

Raha, Rach, ‘Frog’

When frogs are heard croaking towards the end of the dry season and there has not yet been any rain, there is a high confidence that rain will follow. The delay between the observation and realization of rain was given as being anywhere from a few days to a few weeks.

Frog Sounds

“Ok...Ok...Ok ...Ok...”

Shini, ‘Honey Bee’

Bees have been known to consume more honey as rain approaches, perhaps using as much as they can before possible heavy rains damage existing stores. This behavior was noted to occur about a week prior to rainfall. (Gurre)

Tuqa biifa, ‘Mole’

If moles are seen above ground in sunny areas, digging in the shallow sand, it is a sign of the rain approaching. Moles are infrequently observed during dry periods. This may be an attempt to dig more shallow tunnels so as to avoid rising water table levels

Warabes, ‘Hyena’

When the coming season is drought, hyenas may be heard to howl three times. If, however, the coming season is good, hyenas will howl ten times or so. These longer howling sessions were last heard prior to the El Niño rains of 1997. Hyenas are also more likely to be found moving as a group when the coming season is expected to produce rain.

Yaxas, ‘Crocodile’

If crocodiles are observed assuming higher resting places along the banks of the river, rain is expected in the near future. This behavior is likely to avoid the rising water levels of the river with rain. (Corner Tribes)

Flora

For flora, trees are regarded as the most important indicator of possible rain. Trees in the region are divided into two types, those with thorns and those without. Trees with thorns are expected to flower through the course of the year, while those without thorns do not.

Obora, Bok, 'Flowering of Acacia Trees'

Acacia trees flowering in the last few weeks of each dry season are regarded as a marker of seasons rather than an indication of whether or not rains will arrive. This is because acacia are expected to flower with the changing temperature, humidity, and wind direction, regardless of whether or not the season to come holds rain. However, the amount of flowering that is produced by these trees, and its timing, are significant, and are thought to indicate the amount of rain that may be expected.⁴³ If the majority of the acacia trees flower with high volumes of flowers during *obora gudda*⁴⁴, the season to come is expected to produce above average rains.

This is a reasonable assertion, for the same reasons that reproductive behavior in livestock is a likely indicator of eminent rain. These trees have evolved to produce flowers (reproduction) when environmental conditions are optimum; that is with the arrival of the major rains. By doing so, these trees ensure that the water they need for growth is available.



Trees, however, cannot refer to a calendar to know when to initiate this process. Instead, and more appropriately, they rely on rising levels of humidity that precede rainfall. Thus, when humidity increases to appropriate levels, these trees begin to flower. The closer that humidity and temperature approach optimum levels, the more likely that any given tree will be producing flowers. Because of micro-climates and variances in soil quality, some trees will produce flowers before others and some perhaps not at all. If however, a majority of trees are heavily flowering, it is reasonable to conclude that the climate favors rain in the near future. Because even in a dry year humidity is likely to rise to a lesser degree, flowering may be considered a seasonal event. However, the amount of flowering is a likely indicator for the quality of the rains to come.

In normal years, acacia trees begin this process about twenty days before the minor rains (*furmaat*) and forty days before the major rains that follow. This would seem to infer that subtle change in humidity, or other precursors to rain, is detectable by plants (and animals) about a month before the rain season begins, which coincides with other traditional indicators.

Similarly, the absence of *holiis* production⁴⁵, the seedpods that may be produced prior to the onset of rains, may serve as a signal of impending drought. *Holiis* are produced by all trees and provide a good source of forage towards the end of the dry season when pasture is scarcer. If *holiis* is not observed during the *obora guda*, then drought is suspected in the coming season.

⁴³ According to one *Gurre* community, *obora* during the season of *Adoles* serves as an indicator for the *Agai* rains, while that of *Birra* does (for the *Gan* rains).

⁴⁴ There are two distinct flowering events (some add a third) during the dry season, *obora deka* (minor flowering) and *obora gudda* (major flowering). Each of these events takes about one month, with *obora gudda* following *obora deka*. The flowers of *obora guda*, the major *obora* event, are expected to fall with the onset of the rain, while those of *obora deka* are expected to fall with *fumat*, the small pre-season rains.

⁴⁵ One of the *Degodia* communities felt that neither *holiis* nor *obora* were indicators, but that if leaves were observed it was a positive indication of rain to come.

Whether animals take their cues from plants, or are able to make a determination of climate changes on their own is open to speculation. What is certain is that these cycles are interrelated (e.g. tree growth encouraging insect reproduction, encouraging bird reproduction, etc.) and that this activity serves as a valid indicator to human observers that rains should be expected in the near future.

Other Flora Indicators

Arabic Gum

When the coming season is drought, gum does not flow.⁴⁶ (*Muraale*)

Baakal, Ilibi

When the coming season is good, *bakaal* will flower and produce leaves in addition to seeds. If, however, the coming season will be drought, only seeds are produced. (*Muraale*)

Grass

If the rains begin, and within three to four days grass germination is not observed, the coming season is suspected to be drought. This is taken to hold regardless of the intensity of the initial rains and independent of the preceding season's precipitation levels. (*Gurre*)

Gavana (Unknown)

Gavana is expected to turn from red to black if the coming season will be good. (*Degodia*)

Linkaa (Unknown)

Linkaa is observed to germinate with sunlight before the rain. *Linkaa* is an edible plant that is also used as a medicinal herb for treating boils. Germination of *linkaa* is an indication of rain. If the season is expected to be normal or above average, then *linkaa* will also produce a tuber similar to the potato. If the rainy season is dry (with rain) then the node that produces the tuber will not grow. (*Degodia*)

Tuqa (Variety of Tuber)

Tuqa is an edible, rust colored tuber that grows from the roots of a particular tree, thrusting itself above the ground surface. *Tuqa* is expected to appear three to four weeks before the rains if the season to come will be good. Another *tuqa* appearance is anticipated with the onset of rains. However, if the coming season is drought, *tuqa* is not expected to appear. (*Gurre*)

⁴⁶ This observation contradicts the traditional practices of the *Ogaden*, which include consumption of gum during drought years as a wild food when preferred food sources were unavailable.

Tana River

For the communities along the Tana River, rains are known by an increase in the audible volume of the river. This is reasonable because rains are likely to begin in the highlands before reaching the lower lying areas along the Tana River in Garissa and Ijara Districts.

Daua River (seasonal)

If the *Daua* river is full by the month of *Bandambei* (last month of *Adoles/Hagai*) at the beginning of *Agay*, the *Agay* rains will be good. This is only a positive indicator i.e. lower levels don't necessitate drought, though may mean lower rainfall. The observation is recalled in the saying, '*Agay* and its river will not prosper together.' On the other hand, if the *Daua* river is dry at the beginning of *Gan*, these rains will be good. During this time, shallow digging in the river bed is expected to produce water. However, if the *Daua* River has water before *Ghan*, the rains are expected to be short.⁴⁷ (Gurre)

Wells

In general, if shallow wells are dry at the onset of the rain seasons, that season is expected to be poor (Gurre)

⁴⁷ This may indicate that earlier rains intended for the area passed by, falling instead in the highlands. This would cause the Dow River to flow before rain was experienced in lower lying areas.

Figure 1: Notes on Paranormal Indicators

I have used the word paranormal for lack of an alternative. I don't believe that these practices should be immediately dismissed because no explanation of their origination is easily forthcoming. Consider that through time our understanding of the universe has increased (and in some cases, decreased), providing rational explanations for events that were previously attributed to magic or mysticism. Likewise, the practices mentioned here may, in time, be rationally explained as our understanding of the human psyche expands.

I was reluctant to discuss what appear to be paranormal indicators when speaking with communities, as the Koran prohibits predicting the future. It was difficult enough to convince communities to share their knowledge of more easily explained indicators because of the misconceptions about this knowledge and internal social and religious pressure. I elected, therefore, not to discuss 'paranormal indicators' with most communities, as introducing this subject, was likely to have raised suspicion and jeopardized discussion of other drought mitigation practices.

The knowledge and ability to employ these types of indicators is termed *raag*, and said to be hereditary. In the case of *funno*, consultations are made only at specific times of day – during *salati* (morning prayer), *maghrib* (evening prayer), or *duhur* (midday prayer). Consultations are undertaken only at the request of others and a small gift of *bun*, milk, sugar, or cash is usually given in return for this service.

Sandal Dropping

'Sandal dropping' is traditionally the domain of men. In practice, a question of concern is asked (e.g. the expected strength of rains to come or the location of lost animals, and a pair of sandals cast to the ground).

The position of the sandals after they have landed on the ground provides a reply. Overturned sandals may represent death or, half-overturned, sickness and disease. Sandals pointing in the opposite direction may indicate lost animals.

Examples of *Funno*

Lost Animals

The loop of rope is laid on the ground and a leaf and flower placed on top of it. The loop is then taken in the right hand and spoken to, 'Animals are lost, they are going to be eaten...' The rope hits the ground, the loop favoring the village (relative to the position of the woman). 'This direction [pointing towards the village] indicates that the animals are safely on their way back to the village.' The process is repeated to confirm this hopeful response.

(continued)

Funno

Women traditionally practice *funno*. It is similar to 'sandal dropping' as a question is asked and answered in the observations made from a loop of rope being slapped against the palm of the practitioner. In questioning the rope, the practitioner will take a position that assumes certain events will come to pass e.g. the animals are lost and will all die. The rope is questioned in a quarrelsome manner as to why this event will come to pass, the tone assuming that the rope will give a false answer. The true answer of the rope is confirmed when the same observation is made about three times in succession. The process begins, by laying the loop of rope on the ground and placing a tobacco leaf on

the rope for good luck. *Funno*, like 'sandal dropping' is not a certain indicator. However, it may confirm other observations or serve as a starting point so that action can be taken.

*Examples of Funno
(continued)*

Village Raid

'There will be a raid, why are you [rope] not telling the truth? Combatants are standing ready. Who will support the village?' *The loop is taken in the right hand and made to slap the left so that the end swings free. The end of the loop is allowed to 'land' on the hip. cheek. etc.*

*Intestinology*⁴⁸

Intestinology is the study of the intestines of an animal to gain knowledge of approaching rain, conflict, health, or other community concerns. The practice is most effective when the reader's livestock is slaughtered and used. Different areas of the intestinal tract represent different areas of community concern. Only cattle and shoats are used for intestinology, with cattle the more accurate indicator. The intestines of camels are not used for this practice.

⁴⁸ Wekesa, Mike, *Traditional Drought Indicators*, Acacia Consultants, 1999

Traditional Drought Coping Strategies

There are many strategies that have developed over time to mitigate the impact of drought in pastoral communities. These strategies are dynamic and continue to evolve according to the circumstances and resources available to communities. Grain markets and relief foods are just two examples of resources that have been incorporated into the framework of 'traditional' drought coping strategies in recent decades. These have replaced older traditions because either circumstance (i.e. resource availability and/or access, population distribution, etc.) has changed, or newer strategies have proven more effective at preserving livelihood resources and promoting the well-being of households.

In addition to the traditional strategies outlined in the following pages, it should be noted that even in 'normal years' communities systematically act to prevent future crisis. Whether to mitigate the impact of losses due to conflict, disease, drought, or floods, pastoralists diversify the composition of livestock herds to safeguard their food security. A livestock owner might also distribute livestock among relatives, while maintaining ownership, to limit personal losses if disease or conflict strikes one group. These strategies are employed aforesaid because in cases of widespread concern or emergency, markets are often incapacitated, and pastoralists unable to transfer livestock.

Migration

After prayer, temporary migration is the most likely coping strategy to be employed by pastoral communities.⁴⁹ **While other strategies are discussed at length elsewhere, it must be emphasized that these other strategies are secondary and only employed when temporary migration is unavailable.** This point cannot be overstated.

Even in normal years, temporary migration has been practiced under traditional grazing management schemes dictated by elders in the community. In the wet season, livestock would move away from permanent water sites to distant locations designated as wet season grazing areas. With rain, temporary water sources were available in these areas. In the dry season, livestock would return to the dry season grazing areas nearer to more permanent water sources. In the past, these water sources were likely to be natural or hand dug ponds.⁵⁰ Moving from one area to another allowed pasture to regenerate in each.

Because use was rotated to reduce resource stress, if drought or sub-normal rains were received, it was likely that pasture would still be available. In such times, herds would be divided into groups according to their water needs. Families, milk animals, and weaker animals (*warr*) would remain close to water sources while man would take the other groups of livestock (*gu-es*) to more distant locations, returning for water as dictated by the composition of each herd. Because of their water stamina, camels were removed to distant locations and returned to water sites less frequently than cattle or shoats. Hilly areas were commonly sought as these were unlikely to be grazed in normal periods. This scheme conserves the pasture nearer to

Migration is usually not undertaken as a strategy until the major rains are expected to have arrived, even if traditional indicators are observed that indicate a strong possibility of drought. The reason for inaction is not a lack of confidence in the observed indicators, but that it is not yet clear where groups *should* migrate to... Only once the major rains have arrived and the probable rain distribution determined, does migration occur.

⁴⁹ Even the agricultural communities expressed that in times of drought migration to nearby areas along the river was the likely response if these areas had received rain.

⁵⁰ Traditionally, these water sources were private, and not public, goods. Thus, areas around more durable watering points were less likely to be overgrazed as access to water could be restricted by the owner. Use of these water sources was usually repaid by expanding the pond or through desilting. Today, most water rights are administered by communities as semi-public goods. This makes it more difficult to restrict access and ensure sustainable grazing practices in areas around these water sources.

water sources for weaker animals that are unable to trek between pasture and water, while allowing continued access to animals producing milk.

Another important point to understand is that in the past, drought was a local phenomenon, spanning only a single season. This perception is evidenced in the traditional drought cycles observed by most communities (see *Drought Indicators: Annual Cycles*). Because drought is usually restricted to smaller zones, livestock can easily be moved to areas that have received more rain, once elders have met and negotiated the most appropriate grazing pattern. Even in the case that drought was more widespread, lower populations and the use of traditional grazing management schemes meant that pasture from the previous season could sustain livestock through the next wet season. Only in the presence of aggravating factors were pastoralists likely to resort to the other coping strategies. The current drought is exceptional for two reasons, its longevity ('99 – '01) and its widespread coverage.



Migration is usually not undertaken as a strategy until the major rains are expected to have arrived, even if traditional indicators are observed that indicate a strong possibility of drought.⁵¹ The reason for inaction is not a lack of confidence in the observed indicators, but that it is not yet clear where groups should migrate. It would be foolish to move cattle to a

distant location only to discover with the arrival of rain that you had miscalculated and positioned yourself even further from now available resources. Only once the major rains have arrived and the probable rain distribution determined, can migration occur.

However, this is not to say that people have not responded. The consensus among community elders was that if a combination of indicators suggesting drought was observed by individuals, they would meet collectively to pray for relief and discuss the what action might be taken in the event of drought. Thus, the community has entered a state of alert and has begun to mobilize under these circumstances.

In the past, a major impediment to temporary migration was clan boundaries, instituted by the colonial administration. These boundaries prohibited the movement of clans and livestock outside of their respective territories and deprived pastoralists of their most effective means of mitigating wider occurrences of drought. Although clan boundaries were removed with independence, movement today is increasingly restricted by patterns of development that significantly impair the access of livestock to water and pasture. Today, grazing patterns and mobility are not directed by elders in consideration of sustainability, but by the number and proximity of administrative centers.

⁵¹ If livestock is moved away from water sources, it is not more than two nights distant.

Food Preservation

Preserving food is the only way that it can be effectively rationed in times of food insecurity. Kenya-Somali pastoralist and agricultural communities employ a variety of practices. Pastoralists may elect to store milk or ghee following an exceptionally productive season, while farming communities along the riverine areas are more likely to preserve grain following their harvest.

Slaughtered Animals

When large animals are slaughtered, the food they provide is hoped to take a family through the remainder of the drought. This means that the animal should last at least one month. Traditionally, the animal is divided into four categories, each with its place in the preservation and consumption pattern: bones, meat, oil and skin. The only part of the camel not used is the lungs. Parts like the upper hoof produce considerable amounts of fat, which may be eaten.

Laf, ‘Bones’

After the animal is slaughtered, the bones are placed briefly on the embers of the fire, and then dried on tree branches. The bones and the meat that remains on them are usually one of the first parts of the animal consumed. After the meat on the bones has been finished, the bones are boiled to make soup.⁵² Through boiling, *hhen* (oil) and *hoka* (marrow) are extracted from the bone, giving substance to the soup. After cooking, the bones will again be dried to preserve them for next use. The bones continue to be cooked and broken until *hoka* is no longer produced with cooking. Oil from the animal may be added as well, as levels of *hoka* decline with repeated cooking.

Dallu, ‘Oil’

When a large camel is slaughtered, it might be expected to produce one hundred liters of oil and fat. It is important to slaughter large animals to ensure that enough oil can be collected, as it serves to supplement and preserve the other parts of the animal. After collecting, the oil is cooked to separate the *guguuble* (fat). The fat will be consumed before the bones, as it spoils quickly. The oil that remains will congeal and be kept indefinitely. Oil will be used throughout the consumption process to supplement other foods, especially for children. When other parts of the animal have been finished, the oil will be added to water that has been boiled with the bark of certain trees. Trees used for this are *moqlul*, *kajola*, *kuro*⁵³, *hagar*.

Gaji, Drerin

Meat is cut into thin ‘ropes’ and hung from trees where it is allowed to dry into thin strips over a period of days.⁵⁴ The *gaji* will be stored in a sack termed *daduu*, made from the fiber of certain trees. This will be eaten after the bones have been finished. It is prepared by either placing it in the embers of the fire or, if water is available, crushed and boiled to make soup. Oil may be added to this.

Kochee

Some oil may be combined with the dried meat to make *koche*. This may be stored for longer periods in a *dool*, a bag sewn by women from camel skins.

⁵² Alternatively, one group indicated that the bones with the marrow were given to the youth, to be used as they tended the livestock

⁵³ *Qurac*? Common Acacia Tortilis

⁵⁴ Some Ogaden communities indicated that this meat was also salted as it was dried.

Qorqoro, Qumat, ‘Skin’

The animal skin is removed and the *raro* (flesh) scraped completely away. This will prevent the skin from spoiling as it dries. The skin is then placed on the briefly on the fire to remove the hair, and then for a longer period on the embers until it is charred. The skin is then beat with a stick until the char is removed. The char should take the hair and surface skin layer with it, leaving it soft and white. This will be cut into round pieces and allowed to dry for a period of days producing *qorqoro*. This is usually the last part of the animal consumed. It is prepared by either placing it in the fire or by boiling it for long periods. Because it is difficult to eat, it is taken with oil and chewed... and chewed... and chewed until it can be swallowed.

With cattle, if there is a market available, the skin is likely to be tanned and sold for grains.

Other Foods

Ititu, ‘Dried Milk’

Perhaps not as common among some communities is the practice of drying cattle milk in seasons where there is surplus production. This is saved for drought years or years of sub-normal milk production. The milk is first allowed to ferment and the ghee removed. It is then boiled for long periods to allow most of the water to evaporate. The paste that remains is then spread out allowed to dry in the sun. The dry ‘chunks’ are then crushed and stored in a container termed *qumba*⁵⁵ or the smaller *hama*. During a good season, a family might be able to fill four *hama*.⁵⁶ As milk production allowed, quantities of dried milk would be added to the container. Milk preserved in this manner can be kept for five years, though is generally consumed by children during the dry season before that time. When needed, the milk powder will be taken from the *qumba* and mixed with water in a smaller container termed *hama*, to be fed to children. It is said that the woman of the household will not allow the *qumba* to be emptied, as this represents the families well being in the event of drought.

Children & Food

Traditionally, children are given priority for food in households. When milk production declines, children will continue to take milk after other members of the household have ceased.

Alternatively, milk ghee might be preserved in sacks, tightly stitched together to prevent the oil from escaping. Ghee would be added and removed from this container regularly. It was expected that this sack could easily be filled over the course of a normal rainy season. If the following rainy season was also good, the process would be repeated and the first bag sold in Lamu (Somalia) at the end of the season. It is said that ‘if you take one spoon [daily], you only need water to keep good health.’

Garas, Garse (Tree Species ‘Dobera Glabra’)

Garse seeds are similar to beans in that if the membrane surrounding the seeds is removed, they may be dried in the sun and kept for a very long time. The membrane is removed by boiling the seeds in water



⁵⁵ The *qumba* is a container made of camel skins tightly stitched together. Generally made by women the art is said to be lost.

⁵⁶ Responses ranged between two and ten depending upon the wealth of the family and the amount of rain.

with ash, sieving the seeds. *Garse* seeds are generally harvested during *Gu* and stored in either *hamas* or sacks made of animal skins.⁵⁷

Bakarr (Storage of Grains)

Among agricultural communities along the riverine, grain storage is a common practice.⁵⁸ Maize or millet is stored in *bakarr* either above or below the ground. Although grain stored below the ground is usually better preserved, it makes for poor seed grain. Seed is stored above ground when it will be used for seed or when it is expected to be accessed regularly i.e. normal grain stores. Most communities agreed that grain could be store in the *bakarr* from five to ten years.

In the process of storing grain, the maize or millet is first harvested (*tobales*). It is then allowed to dry in the sun for a period of two weeks. After drying, it is shucked (i.e. covering removed exposing the kernels) and placed in loose ‘bags’ made of palm fronds woven together. The shucked maize is allowed to dry (*walafikur*) for a few days in these bags.



The *bakarr* is now prepared by digging a deep hole on high ground to avoid water seepage and contamination of the store. A fire is then made in the *bakarr* to kill any insects, plant roots, or micro-organisms that might be in the soil around the *bakarr*. The maize is then taken out of the bags and placed in the *bakarr*. Large stones are placed on top of the maize, followed by smaller stones. Mud is applied to the surface of these smaller stones to seal the *bakarr* and prevent rainwater from leaking into the *bakarr*. Finally soil is placed on top of the plaster and the location marked.⁵⁹ *Bakarr* are usually about two meters deep, with another thirty centimeters between the grain and covering ‘gate’.

The *bakarr* may be reused and is burned before each use. A single family may have three to four *bakarr*, removing a week’s ration of grain at a time and resealing the *bakarr*. Even in dire times, seed grain is preserved.

The Daa River communities provided the saying, “Abuslsheh Amet, Uthusheh Amet”, ‘Whoever eats the seeds meant for planting eats feces [later]... or child’.

Case Study: Changing Water Practices

Previously, people used to settle quite far from Wajir – perhaps two days journey. Water was collected every week by camel. Each camel could carry four *haan*. *Haan* are traditional water containers made, maintained, and owned by women. (This implies that women also were responsible for the management of water within the household.) Water was conserved in every area because of the time and energy required obtaining it e.g. children might only be given water at mid-day to counter the heat of the afternoon. At the same time, the water needs of households were less. Changing water needs

⁵⁷ One Ogaden community indicated that this and the drying of milk was last practices 75-76 years ago. Reasons given for the decline of the practice were improved access to markets during drought and relief food. The latter is a much more recent development, appearing 20-30 years ago.

⁵⁸ One group of Ogaden elders speculated that, of the people who practice agro-pastoralism along the riverine, perhaps one in three might be able to store maize grain for seasons to come.

⁵⁹ With time, plants and even trees may grow over this area. One group of elders suggested that the *bakarr* could be located again if people went and slept in the general vicinity. It was said that the body heat of these people would heat the ground above the *bakarr* faster than the surrounding soil, thereby revealing its location.

require considerably more water be brought from watering points to *boma*. (continued)

Examples of Changing Water Use

- The frequency of drought in recent years has taken its cumulative toll on the stamina of livestock. Livestock that could be taken to watering points in years past must now be watered at home.
- Today, water is required to cook maize, millet, rice, and other foods. Previously, diets consisted of only milk and meat; neither requires water for preparation.
- Today, people bathe and wash their clothes regularly. Before, people had only one set of clothing. They would wash this and bathe only when they went to draw water.

A *bakarr* constructed above ground is made from a small structure that is raised half a meter off of the ground. The walls are made with branches and palm fronds and the floor and walls plastered with cow dung.⁶⁰

Deri, ‘Soil Pot’

Deri is only used to store food for short periods of time. Food is cooked without special preparation. When it is ready, oil is added and the mixture placed in the *deri*. This soil pot is then sealed completely using a tin and a piece of cloth. The seal should be airtight. The *deri* is then stored upside down. If the *deri* is still warm after a period of five days, then it may be eaten.

⁶⁰ Millet and beans would be stored in a separate *bakarr*. The bean is allowed to dry on the plant and then placed in the *bakarr* without removing the skin. Millet is allowed to dry on the plant and then cut. It is then allowed to dry further for one month, all the while protected from birds. Next, it is beaten with sticks and the chaff removed. The millet is collected and put in *arar*, a bag made from the bark of a tree and stored in the *bakarr*.

Alternative Foods

When pasture is good, pastoralist households depend on milk produced by their animals for food. When pasture or water become scarce, milk production declines and people turn to alternative foods. While milk production continues, these foods supplement lost milk. If conditions do not improve, alternative foods become increasingly important in household consumption. Although some people may turn to hunting, most alternative foods are collected among the plants available in the Northeastern Province. These include roots, tubers, bark, tree sap, seeds, and leaves.

Roots & Tubers

<i>Malmal</i>	This plant was uprooted and its roots eaten
<i>Umboi</i>	(see <i>Malmal</i>)
<i>Roppia</i>	(livestock)

Stems, Bark & Sap

<i>Kurow</i>	The bark of this tree was boiled to make 'tea'.
<i>Khirari</i>	The stem of this tree was split and chewed because of its high water content.
<i>Hagar</i>	The bark of this tree was boiled with water because 'it adds color'.
<i>Adad</i>	The gum (sap) of this tree is very sweet and is eaten. It is also used for diarrhea.
<i>Ampe</i>	The gum of this tree is boiled with milk when it is available to make porridge. Otherwise, it is taken raw.

Leaves, Fruits & Seeds

<i>Armo</i>	The leaves of this tree are 'just like cabbage'. They may be stewed with milk and eaten.
<i>Dalol</i>	The leaves of this tree are boiled giving something akin to 'sukuma' (Kiswahili)
<i>Hamur Gap</i>	This riverine fruit and its seeds are eaten.
<i>Garas (Gersi)</i>	The seeds of this tree were dried, boiled, and then eaten. ⁶¹
<i>Bukha</i>	These are grass seeds that are pounded to make porridge
<i>Dalaat</i>	(see <i>Bukha</i>) These are collected by women and children.
<i>Maleka</i>	The seeds of this riverine plant are eaten. The seeds are soaked overnight and boiled to make tea. Bedding is also made from this plant.
<i>Bahr</i>	Safaris might be taken over 3-4 days to collect these palm nuts along the riverine, transporting them by camel.

Other Wild Foods

Honey	Wild honey is eaten whenever it is available.
Giraffe	<i>Keri-Ieris</i> , 'giraffe hunting' ⁶²
<i>Kone</i>	Riverine (unknown)
<i>Habak</i>	Riverine (unknown)
<i>Koseia</i>	Riverine (unknown)

Bovine Blood

In the distant past, the blood of cattle was taken as an emergency food when milk was not available. This practice declined with the introduction of Islam because taking blood is forbidden in the Koran. Previously, when the health of people in the community was in jeopardy, cattle blood would be given to them. The blood was extracted from a strong, young animal by first tying a rope around its neck and

⁶¹ *Garas* is a very important wild food because it is the only fruit that grows in times of prolonged drought. *Garas* seeds might be collected, dried and saved for future use. It is cooked, dried, husked and then prepared like beans. (*Duwan*) 1920 was known as the Year of Gersi because this was the only available food source. *Garas* is commonly found in low-lying areas with white soil.

⁶² One group of Ogaden elders indicated that this was done from horseback using spears. 'The horses would be given the blood of giraffes and learned to chase harder for this reward.' Ajuran also mentioned hunting giraffe as an alternate food source in times of drought.

applying pressure until the vein appeared. The vein was then cut and the animal allowed to bleed. Perhaps five liters might be collected before pressure was applied to the cut and bleeding stemmed. An animal might only be bled once per season as the health of animals was also likely to be poor during drought and this was only used as an emergency ration. The blood of the animal was then taken boiled or raw. It was said that sick pregnant women or children were likely to be the recipients of this treatment.

Today

Wild foods are relied on less today as a drought coping strategy for three reasons. First, markets are now available where livestock or other resources (firewood, etc.) may be traded for grains. Second, increasing populations (cultivation, competition, etc.) and frequent droughts have reduced the amount of wild foods available. Lastly, relief food has reduced the need for these. This last point is related to the second. If relief food were not available, the wild foods available would not be sufficient for most of the population. Many communities stated that prior to relief (circa 1970), morbidity was much higher in times of drought despite the use of wild foods.

Figure 2: Ethno-Veterinary Practices

Caring for Vulnerable Animals

There are five distinct soil types in the Northeastern, identified by their color and texture. Each soil has its own individual mineral and water bearing characteristics, promoting different types of vegetation in each of the soil zones. Thus, *garas* in areas with white soils and *andaad* more likely found in areas with red soils. This knowledge is taken into account in when selecting dry or drought season settlement areas.

Fodder

During times of drought, men will take the stronger livestock to distant areas in search of pasture. More vulnerable animals remain behind at the *boma* in the care of women and younger children. Pasture resources are likely to be depleted in the areas around the *boma* by this time; part of the responsibility in caring for milk animals and weaker livestock then collecting animal fodder. Pasture is likely to be found in hilly or rocky areas where grass is inaccessible to livestock. Women drawing water are also expected to collect this grass, perhaps even employing ropes to get to the more hard to reach areas. *Oko* ('Somali shepherd's staff') may also be used to help this endeavor, lifting brambles or pulling down limbs to harvest *urbu* ('seed pods') from the higher branches of trees.⁶³ Children may assist, throwing sticks into the flowering acacia to collect the blossoms (*obora*) and *urbu*. In riverine areas, palm fronds may also be used.

Fodder is collected and taken to more vulnerable livestock to discourage these animals from trekking long distances for pasture or forage, as weaker animals would be unable to undertake this exercise regularly. Milk animals (with calves) are also allowed to stay near the *boma* this way and continue supplying the children or elderly with milk.

Generally, animals with diseases are isolated from the rest of the herd until the animal recovers, or dies. During drought, the prevalence of tick born disease is expected to decline with falling tick populations.

Diseases

Trypanosomiasis (tsetse)

Dried *kordaboo* is burned and sick animals kept close to this fire.

Rinderpest

For the milder form of rinderpest that causes eye infection and tearing, a cloth is soaked in the urine of the effected animal and placed under the noses of healthy animals for them to smell. The sick animal is cured.

For the more serious variety of rinderpest where the horns of the animal fall off, there is no traditional cure.

CBPP – goats

The lungs of an infected animal are cut into very small pieces. An incision is then made between the nose and eye of a healthy animal. The infected piece of lung is then placed in this incision.

Darera – donkeys

This disease is known by tearing, diarrhea, apathy, and loss of appetite. The hair is cut from the tail and main of an infected donkey. This is then burned and the infected donkey made to inhale the smoke.

OTHER CONDITIONS

Limping

Brand the animal in the area where it limps and the condition will improve. This is termed 'firing' in European practice.

Diarrhea – Camels

Tuq and *Kaadi* are fed to the sick camel for one week after which the animal is expected to show sign of improvement. Water is then added to the camels diet for an additional week. The camel should now have recovered and is returned to the watering point. *Tuq* and *Kaadi* plants are found in *kotich* (areas with black soil).

⁶³ *Dadach* and *adad* were cited as producing *obora* and *urbu*.

Garas, Garse

During drought, *garas* may be the only tree producing fruit. *Garas* serves as a major food resource in times of drought. People may dry and store the seeds of *garas* fruit similarly to beans. Camels can eat the fruit and bark of the tree. Camels may be able to access the branches of this tree while others may not. *Garas* is an 'evergreen'. Pastoralists are reluctant to cut the branches of this tree – preserving this resource for years when food is otherwise scarce. *Garas* is generally found in white soil areas and is one of the only plants that continues to produce food in times of drought.

Roots are also a valuable form of fodder because they have high water content. Particular varieties will be given to milk animals with salt to prolong milk production, especially camels.⁶⁴ Red soils ('waiyal') are especially sought for establishing a *boma* in times of drought because these areas are more likely to have *andaad* (yams) and *ropis*, as well as evergreens like *abaq* (acacia).⁶⁵ Black soil (*kotich*) is unlikely to have these resources.

Branches may also be cut from trees to be taken to the *boma*. This is done for

the various species of 'evergreens', including *arbaq*, *kulun*, *korobo*, and *kumaiyo*. It is not done with *garas* because *garas* continues to produce fruit throughout times of drought. **Both *roppis* and *garas* are examples of plants or trees that are protected in both drought and non-drought times because these plants may be the only source of food in difficult seasons.** In some areas, *garas* may be the only tree standing near settlements, others having been cut for consumption. When collecting *ropis*, only a few roots near the ground surface are taken from each plant, allowing the deeper roots that remain to continue sustaining the plant.⁶⁶

Milk Production

Andaad ('yam') is noted as being especially good for preserving milk production.⁶⁷ However, if milk animals begin to grow weak during drought because of the additional physical stress placed on them by milk production, lactation will be discouraged. This may even involve slaughtering calves.⁶⁸

Alternatively, one cow may serve as a surrogate to additional calves, allowing other lactating cows to cease milk production. This practice allows fodder to be redirected to the surrogate cow.

Water

More vulnerable livestock concentrated around the *boma* need water in addition to fodder. When drought is anticipated, people may begin to make *butte* and *rar*. *Butte* are the large, traditional water containers and *rar* are the harnesses fitted to camels for carrying these from watering points. *Butte* are said to hold twenty liters (4 *ghir* = 1 *butte*).

Camels or donkeys are used to ferry water from watering points to the *boma*. This is used for both human and livestock consumption.

Today

These strategies continue to be practiced. However, areas near settlements are likely to be significantly degraded. This is in part the result of the expanding of administrative centers. These pastures are over

⁶⁴ One community estimated that a large camel could consume 50 kg of roots per day.

⁶⁵ *Waiyal* soils are usually found in low-lying areas. These soils are also likely to have trees or plants with fibrous bark and whose branches livestock may also eat. Examples include *kalkach* and *dumayo*. *Korobbo* and *lumaiyo* are said to be evergreens that regenerate their branches after being cut. Examples of other evergreens commonly found in these areas are: *agarsh*, *kombi*, *sofower*, and *bisele*.

⁶⁶ *Ropis* produce long radial roots with edible nodes. These roots may be 30 meters long and are pulled easily from the sandy ground. Each root will have many 'nodes' that can be eaten by livestock.

⁶⁷ The leaves and flowers of *andaad* may also be eaten.

⁶⁸ This is only done for cattle, not camels.

stressed by year-round grazing, short term grazing when animals are brought to sold milk in these markets, and by the near destitute who bring their limited animals to settlements are likely to attract the near destitute who bring their animals to settlements to access relief services. Even more damaging are some of the development practices. Some examples of these are cutting trees for whitewash (limestone) and charcoal production and building construction. The lack of browsing flora near settlements due development practices increases the likelihood of destitution among pastoralists who have lost the majority of their animals. These people must either bring the few that animals that remain with them to administrative centers when they access relief food and/or other relief services; or leave them behind. In the former case, these weak animals are likely to deteriorate further given sparse grazing available.

If distribution of relief services were more decentralized, it might enable pastoralists who still have some animals to keep them at greater distances from administrative centers where pasture is more likely to be found. These people are likely the most vulnerable when considering the loss of livelihoods as at the conclusion of drought they may have enough livestock to return to pastoralism with limited assistance.

Cereal Trade

A commonly practiced strategy during times of drought for groups with access to grain markets has been to trade resources for grain. Pastoralists would trade livestock or hides for millet, while the Corner Tribes along the Daa River would trade pre-fabricated palm roofing sections or *arar*. Although colonial administrators in Kenya would not allow the migration of livestock across clan borders, they would issue permits for livestock trade for grain. This made cereal trade a valuable alternative in times of drought.

While communities in eastern Mandera might travel to Luq (Somalia), those in western Mandera were more likely to trade for grain in Moyale (Ethiopia) when this market developed⁶⁹. Ogaden in Garissa were able to trade with agricultural communities along the Tana River, where a small goat might fetch 100 kg of grain.

The practice of community grain safaris has decreased over the years with the growth of administrative centers and available markets and, in the case of the Daa River, the decreasing availability of these traded resources.

Case Study: Bambo (Mandera)

The trade of livestock for grain in Luq (Somalia) was employed many years ago, before markets were available in either Mandera or El Wak. Community elders would come together and decide whether to slaughter animals (see *Community Slaughtering of Animals*) or to sell camels in Luk. Because drought is commonly a local phenomenon, Luq markets usually presented a very good camel to grain exchange ration. Unlike livestock, grain does not deteriorate with continuing drought and might be the better option if continued drought was anticipated, also serving as a form of destocking.⁷⁰

When the decision to trade for grain was made, people in the community would contribute camels to be traded. The families of the young men undertaking the journey would contribute one goat each. These animals were slaughtered and preserved (see *Food Preservation: Slaughtered Animals*) for the journey. Decisions regarding livestock to be traded were made by each household. The grain safari was expected to take one week, with three days travel in each direction.⁷¹

⁶⁹ Previously, the nearest market was also Luq (Somalia), 300 km away.

⁷⁰ Destocking is not held in high regard as the prestige of an individual, as well as household food security, is dependent upon the number of livestock owned. Elders estimated that, in the past, seven of ten people would prefer **not** to destock during drought because of social pressure and the associated loss of prestige. (The increasing influence of drought, however, is redefining previous social norms.) Other means of achieving prestige in the community were given as religious leadership and secular education, with religious leadership given the highest regard, followed by livestock ownership.

⁷¹ Trading cattle or sheep for camels or goats was not possible as these markets simply did not exist.

Case Study: Neboy (Mandera)

In drought years, the agricultural communities of Neboy were likely to experience crop failure. When their stores ran out, the community would come together and arrange a grain safari to Luq (Somalia) to trade pre-fabricated palm roofing sections for grain. This resource is only found in some sections along the Daua River and was not generally available in Luq. Five roofing pieces were said to fetch a 100 kg bag of millet. *Arar*, bags woven from the palm fronds would also be traded.

Young men from the community would transport the roofing sections by donkey to Luq, eating palm nuts they had collected for the journey. The safari was expected to take five days, with two days in each direction and one day for selling and buying. All of the families were expected to contribute roofing sections to the safari, as palm materials were readily available along the River Daua. Thus, even the 'poor' would be able to contribute something. **When the grain arrived, the elders of the community would distribute the millet according to the size of each of the families.** Families with no donkey or without women to make the roofing pieces would be assisted.

This was last practiced in *Septi Dirr*, 1958. With time, markets developed in Mandera allowing households to independently undertake the trip in a single day.

Sare tante idad (Sere hisi) or ‘Tie Your Dog’

In times of drought, when milk production and available pasture have severely declined, and other sources of food are unavailable, heads of households (*abba-olla*) within a community come together and make a collective decision to slaughter animals.⁷² This is done after prayer, reading of the Koran, and close consultation. (See *Forms of Community Assistance: Robdoon*) Communities practicing this are generally composed of less than ten families. Each family is expected to slaughter the largest animal available to them, usually a *duffan*, ‘large castrated bull camel’, as these supply the greatest amounts of oil and meat and are less likely to impact future livestock production than females. This animal, under normal circumstances, might be able to be rationed through the remainder of the drought.⁷³ It should be noted that the slaughter of livestock is generally considered the last resort as it undermines future food security.

These camels would be slaughtered on the same morning. This was done to prevent members of one family from going to another and asking for food, as everyone would have food on this day. Hence, it is termed by some communities ‘tie your dog’. Very strong social obligations among these households would require a family to share this food, to the detriment of its own welfare, if this were not practiced together. This has important ramifications for current interventions and the expectations in a system of targeted relief distributions. Though weakened, these social obligations are still quite strong and likely to result in a redistribution of food aid throughout the greater community.⁷⁴

Families Without Available Animals

Those families whose livestock is unavailable because it was at great distance, may be given an animal to be replaced when their own become available at a later date. Others who had no large bull camels might be given one to be replaced later with future male camel offspring. Alternatively, those who elect to slaughter later may borrow particular pieces to be replaced when they slaughter their own animals. *Chapsa* may also be practiced in the event that requests for assistance are denied. (See *Forms of Community Assistance: Chapsa*)

Those families who are without livestock are traditionally given specific parts of the camel. The combined gifts as the community as a whole should be enough to help these families. Traditionally, each family would give the lowest rib, one rear leg, and half of the neck.⁷⁵ While such gifts are at the discretion of those slaughtering animals, elders in the community may elect to force this distribution to destitute families if they feel people may otherwise suffer. In other communities, the practice has been to preserve one rear leg (*uduut*) for poor families (*bakanya*) while the sternum (*shafh*) and shoulder (*sarar*) is given to a village elder. These latter two pieces will then be prepared by the elder and given as a meal to people visiting the community. This is not meant as distribution to people in surrounding areas, but to reduce the burden of hospitality upon the community when visitors arrive.

⁷² This practice was not a common practice in agricultural or agro-pastoral communities. Some pastoralist communities indicated that slaughter was done individually.

⁷³ Normally, drought lasts only a single season. As a result, milk production is unlikely to cease completely and livestock are expected to recover relatively quickly in the following rain season.

⁷⁴ For example, WFP currently targets 70% of the drought population. However, because of the current drought’s longevity, even those with livestock have either sent them to distant pastures rendering them unavailable for food; or, the milk animals they have are no longer producing. If traditional restocking does occur, these are the people who would be able to undertake it. It is therefore to the benefit of the community to redistribute food to the whole. The result is that food intended to last three weeks are consumed within two to three.

⁷⁵ Some communities suggested the rear leg and shoulder blade as gift pieces. Others specified that the back was for men and the other parts for women.

The oil, meat, bones, and skin of the animal are then preserved using traditional practices.⁷⁶ (See *Preservation: Slaughtered Animals*.)

While one animal is hoped to be enough to see a family through drought, it may not be if the drought is prolonged and/or milk production is slow to restart. In these cases, the community will come together again and repeat the process. For example, during *Kamis (Khamis) Nyatuu* (1921), up to four *duffan* were slaughtered by each household through the course of the drought.

Today

Given current levels of livestock poverty, similar numbers are unlikely to be widely replicated. While some communities indicated that this practice has fallen in recent decades, others related that it had been used during the current drought but is more commonly undertaken in more remote settlements.⁷⁷

There are two implications for current and future relief interventions. **The first is that targeted food distribution is likely to be redirected to the community at large. The second is that destocking exercises, where the meat is given to communities, should be undertaken in a single day, allowing them to preserve or consume the meat in the manner that best suits them.** There is also a strong feeling among the pastoralist communities that WFP should consider purchasing livestock for slaughter as part of the relief basket to communities experiencing emergency drought conditions. The provision of oil should be considered to help in the preservation of this food.

Reasons Cited for the Declining Practice

- *Decline in general animal and herd sizes* – The deterioration of traditional grazing schemes water sources with the proliferation of administrative centers in some areas and incidences of conflict in others, along with the increased frequency of drought in the past decade, have led to a decline in animal size/health. Increasing populations and social inheritance customs have led to a decrease in the livestock per capita ratio. Because animals have less fat and meat, they are unable to keep a family for a long time. Reduced amounts of fat on animals would discourage traditional preservation practices of the slaughtered animal necessary for its rationing. Because of the smaller herd sizes, this practice would quickly reduce herd size without guaranteeing the survival of families.
- *Increased destitution* – Increased destitution within pastoralist communities means that less people would have the large livestock needed to slaughter. Support of these people would overtax those with animals leading to their increased vulnerability. As a result, people are more likely to slaughter as individual households, if at all.
- *Increased cash based needs* – Increasing cash based needs and the use of consumer goods have resulted in the sale of those animals that would normally be slaughtered in this practice. Examples of these cash items include school fees, clothing, water, and food, all within the context of declining purchasing power.
- *Changing food acceptance* – Previously, many pastoralist communities were not accustomed to eating foods other than meat or milk. Grain based substitutes were not available and unfamiliarity made them unacceptable alternatives. Today, however, alternative foods are widely available, making cereal trade a viable alternative and preferred when the livestock to cereal trade ration benefits pastoralists.

⁷⁶ Each camel might produce 100 Liters of oil, which may be used as both a source of food and to preserve the other pieces of meat.

⁷⁷ Many interviews were conducted in administrative centers. Smaller and more rural communities appeared more likely to continue this practice.

- *Increased size and specialization of communities* – Migration to administrative centers have made communities larger. Destitution and specialization within these larger communities have led to a reduction in the number of people with livestock available. In more recent years, continued drought has forced many people to send their livestock to distant locations and suitable animals cannot be accessed. Also, the increased size of these communities makes the practice more difficult to undertake.
- *Introduction of relief food* – Relief food in prolonged drought has enabled communities to preserve their livestock as a source of future food security and income, thereby reducing future drought vulnerability.

Forms of Community Action & Assistance

In pastoralist groups, there are four major ways that livestock resources are redistributed to promote the welfare of people within a community. These are religious practices, community responses, social obligations, and self help.

Religious Practices – Robdoon, Zakad

Robdoon

When pastoralist communities face drought or other emergencies, one of their first responses is for the leaders to gather for prayer, reading of the Koran, and consultation with one another. Elders and sheiks will gather on a given date to read the Koran and pray. This is a pro-active form of mitigating emergency that appeals for assistance on several levels. Over the course of a period of days, they will also discuss what collective action should be taken. Such action may be the transfer or lending of livestock to assist 'poor' clan members or to arrange with other clans/peoples for the use of pasture outside of the drought-affected area and migration.⁷⁸ This discussion may take place at the sub-clan or community level. In such cases, the leaders are well acquainted with the resources of the people in their communities and able to dictate what may or may not be within the means of their represented peoples to contribute.

Zakad

Given that most of the Kenya-Somali pastoralist population of Northeastern Province is Muslim, the practice of *zakad* is common. While not a drought relief strategy per se, *zakad* requires people to give 2.5% of their wealth to the poor. In the case of livestock ownership, this follows an established schedule. For example, the owner of 40 shoats would be required to give one shoat. Likewise, the owner of 5 camels would be required to give one shoat. If 30 cattle are owned, a bull of three years might be given. The number of livestock given increases in direct proportion to the number of animals owned. If a person owns less than these numbers of livestock they are not obligated to give any. Unfortunately, as the number of poor increases, this becomes less effective in terms of restocking – as it is more difficult to achieve self-sufficiency. In some cases, these animals are given to the elders of the community who come together to decide how they may best be redistributed. In other cases, the owner gives this tithe to the beneficiary directly.

Other Obligations

It is also the religious obligation of people to honor requests of help to them, provided that it does not inure them.

Self Help – Chapsa and Traditional Courts

Chapsa

If an individual goes to a family or clan member and is refused assistance, there are two options available. He or she may go to the elders of the community and lodge a suit against these people, or simply take an animal from them. This latter self-help action is termed *chapsa*. After having taken and slaughtered the animal, this person will ask two or three elders to accompany him to see the owner of the livestock. He

⁷⁸ The leadership structure of these groups is highly developed, though increasingly undermined by political action and climates of Ethiopia, Kenya, and Somalia. Understanding these structures is important to understanding the decision-making processes of these groups during emergencies at the sub-clan and clan levels, for both natural disasters and conflict. This is an area that warrants further documentation and consideration in developing longer-term development and response strategies.

will then ask for forgiveness, placing the Islamic rosary on the head of the owner as a sign of deep respect, witnessed by the elders. It is the social obligation of the owner to accept this apology and forgive the actions of the person. It is also understood that animals like cattle and sheep are likely to die over the course of drought and so rationalized as resources that might otherwise be wasted.

Traditional Courts

If instead this person elects to petition his case to the elders, they will decide if the family member is indeed obligated to assist the individual. The traditional courts of these communities recognize the right of the poor to assistance from their relations who are capable of doing so without putting themselves at risk. In other words, there is a moral and social responsibility for these people that is understood to exist and this is enforced by the powers invested in the elders by the community.

If the elders decide in favor of the person requesting assistance, they will penalize the family member at fault of neglect. A fine (*karraa-mata*) is given to the elders who have made the judgment and the requested support is demanded for the person requesting assistance. If this judgment is refused, the greater community will decide the outcome together, either taking animals by force, or ostracizing the offending party. Since independence, the government courts have not shown the same consideration for the moral and/or social responsibilities of these communities.⁷⁹ As a result, these communities no longer have the legal right to enforce their traditional process of adjudication, aside from ostracizing the neglectful party. This, however, is described as effective because it eliminates the possibility of future assistance to these parties in the event that they are visited by catastrophe. Because institutionalized state social services available are not always effective in supporting individuals, people recognize and seek the continued support of the communities that they live in.

Communities made it clear that restocking is not a reason for conflict, within or between clans. That said, one party or the other is likely to lose livestock if conflict should arise.

Social Obligation – Patronage, Orge (destocking), Irmansi (Ameis)

After an individual has exhausted the resources available to them i.e. consumed all stores, taken and slaughtered their small stock, and so forth, they may move and settle near relatives with resources. They will either be given *orge* or *irmansi* (milk animals) to use until their condition improves through *irb*, *zakad*, etc. or absorbed into this family, sharing the labor and resources. If one family is not strong enough to support the other, the destitute family may split, with the wife returning for the short term to her family of birth and the children distributed among closer relatives. People may also benefit from the common practice of one family spatially distributing animals among relatives.

Uur-gir, Orge, Radh (*Destocking*)

The meaning of this word is literally ‘unborn calf’. In practice, it is the loan of a bull for slaughter to those without. This loan will be repaid sometime in the future when a bull is born to the recipient. It benefits both parties, as a bull given during drought is likely to perish unrealized. This provides direct assistance to the person in need and preserves the integrity, or future integrity, of the person loaning the animal. In effect, it is an form of emergency destocking.

⁷⁹ According to communities, the colonial administration, despite its many and grievous shortcomings, mostly respected and supported the decisions of traditional courts in these cases.

Irmansi, (Ameis)

This is the loan of a milk animal to families whose milk animals have stopped producing, or who has lost their animals. This animal and the calf are returned to the owner at the end of the emergency or, more likely when the beneficiary is able to acquire milk animals of their own. If this is over the course of a period of years, the subsequent calves will also be returned to the owner. Alternatively, these may be kept by the beneficiary at the owner's discretion as a form of *zakad* or restocking. In this latter case, the common practice is to return female calves to the owner while the beneficiary keeps any male calves. *Irmansi* is less likely to be practiced during drought because of the lowered milk production under these conditions.

Other Loan Animals

Other loan animals given in difficult times are likely to be camels or donkeys if they can be spared. These are vital to the survival of drought as may be employed as beasts of burden, either ferrying water or shifting to areas less impacted by drought.

Community response – Xersi and Irb (Restocking)

Xersi

If there is sufficient milk or grain in a community, *Xersi* may be practiced to help the poor. *Xersi* is initiated by an elder in the community who, sensing the need, takes a *han* (traditional storage container) and places it beside him in the settlement. He then proceeds to announce “*xersi*” to the community. People will respond by bringing milk and pouring it into the container until the *han* is filled. Once the *han* is filled, it is taken to people in the community who do not have a milk animal to supplement their diet.

Irb (Restocking)

Traditional forms of restocking are also undertaken. *Irb* may be a response to disease, drought, or livestock raids and is usually in the form of shoats as these provide the fastest milk means. Form the longer term, camels and cattle may also be given. This assistance is only given to family men who have lost livestock through misfortune in the recent past, to help them begin again. It is not given to those who have lost their animals through mismanagement or to young men to help them get started. It may even be extended to

Vulnerability

Communities regard people with cattle as the greatest liability during drought, as these animals are the most likely to perish. In general, people try to diversify their herds to reduce dependency on cattle and reduce vulnerability. Cattle are sought because of their superior market value. Raising cattle is a calculated risk, balancing herd resilience and profit.

The ‘poor’ are also thought to be vulnerable because even minor declines in production or herd size impact their food security. ‘Poor’ was defined as having less than twenty shoats, five camels, or five cattle. (female)

Other vulnerable groups commonly cited are children, elders, and pregnant/breast-feeding women. These groups rely on milk for food and suffer when this resource is unavailable or inaccessible.

Communities feel vulnerability declines when people have camels, goats, and manpower. Youth between the ages of 15 and 18 are the best source of manpower, especially women, as they are strong and dependable. Labor is critical to providing for milk/weakened animals and moving stronger animals to pasture areas for extended periods.

Interestingly, a man with only one wife was suggested as being less vulnerable, because of the greater mobility of these households. Family size was not considered a burden so long as the family possessed enough accessible labor.

members of the larger clan who immigrate to the area because of conflict, disease, or drought elsewhere.⁸⁰ The number of animals that are given varies, depending upon the resources of the supporting community and perceived need of the individual.⁸¹ Traditional restocking targets specific individuals who are most capable of managing livestock resources, increasing herd size and thus providing social and food security for themselves and other members of the community in the future. In this respect, it is not a purely philanthropic undertaking, instead concentrating on ensuring the future well being and security of the community as a whole.

Restocking may also occur over time as families who have lost their livestock continue to work for patrons and are given livestock each year as payment, with additional livestock provided through the practice of *zakad*. Livestock may also be given to older members of the community as a sign of respect.

Additional Support for Restocked Families (Ogaden)

It is recognized within the community that the animals given for restocking may not be enough to support people in the short term. To prevent full dependence upon this livestock and allow the stock to multiply, communities may come together and assist this family with short term, small scale farming. When it rains, the community will help clear and plant grain that should be able to see this family through the coming year, after which the restocked animals may be able to fully support them.⁸²

Case Study: Warmoo Idow

In 1942, much of the livestock was lost to the community because of the combined effects of Rinderpest and drought. In the seasons that followed, those with the few livestock remaining distributed them to kin. Others appealed to the sub-clan at large. Recovery was assisted by the high reproduction rates of the livestock given relatively good condition of pasture in the area and the availability of wild foods. Similar recovery was not considered possible today because of increased human populations that would decrease the number of seed stock available to each family and the degradation of available grazing land over the course of the past decades.

Interestingly, the minimum number of livestock (females) needed for restocking was given as ten by elders and thirty by younger participants. **Both of these numbers assumed that restocked groups would not be dependent upon this livestock alone i.e. they would have other sources of income.** If alternative sources of income/food were not available, the number of shoats needed for restocking was given as forty to fifty. A common proverb was given as ‘a herd of forty shoats can support a family with four children’. This number of shoats was said to provide enough milk throughout the year to support this family. Fewer animals were likely to be slaughtered or sold to pay for credit advanced over the course of the drought and to meet current needs.

(See also *Communal Slaughtering of Animals*)

Restocking of Agricultural Communities

Agricultural communities along the Daua River generally sold pre-fabricated housing materials to pay for seed grain if they lost existing stores to drought or pestilence, or borrowed from other members of the

⁸⁰ In this case, the group or individual would appeal to their sub-clan in the region. If the burden of supporting these people was too much for this sub-clan, the matter is taken to the greater community/clan where it is decided who and what will be contributed to assist.

⁸¹ As an example, one group of Gurre elders expressed that they had given ten camel the previous week to a member of the community who had lost his livestock to drought.

⁸² An example was given where a man was restocked and then helped to plant along the Wasanyero River for the coming year. After a good harvest, he was able to store several bags of grain, which were sold in the following dry year at fair profit. This man was said to now be one of the wealthiest (livestock) men in the community. (Ogaden)

community. These stores were not eaten during times of drought as evidenced by the saying, ‘Whoever has eaten the seed for planting has eaten his child.’ (See Cereal Trade)

Today

Increasing levels of destitution and environmental degradation have limited the ability of these communities to support those who are in danger of losing their livelihoods. That is not to say that they are not in place and functioning, only that they are impaired by resource restraints.

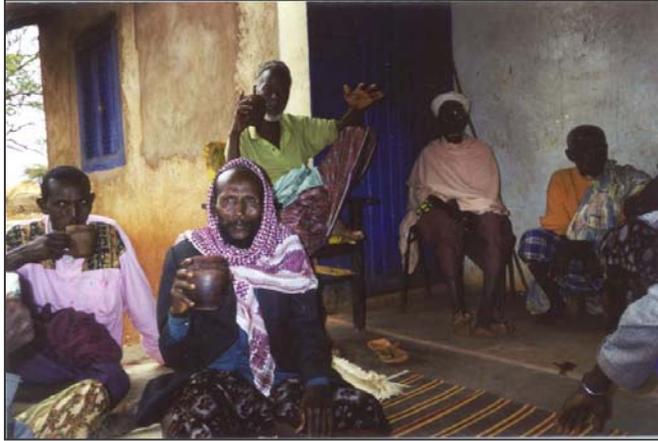
Figure 3: Important Elements of Community Assistance

These traditional forms of community assistance should be considered within the framework of current intervention strategies. Core aspects of traditional community based assistance include:

1. Management through community elders
2. Equitable distribution of resources throughout the community given common states of need.
3. Moral and social responsibility to assist others provided cost does not unduly compromise the benefactor.
4. Support of responsible members of the community – these people are likely to manage resources efficiently and provide future assistance to other members of the community i.e. they are a good investment.

Traditional Knowledge

Kenya-Somali pastoralism has an oral tradition, with knowledge passed from parent to child. Oral traditions require active participation for sustained existence. The increasing influence of foreign factors and agents on pastoral communities is discouraging this knowledge from being practiced or transferred from one generation to the next.



Should oral traditions continue to be ignored or abandoned, their wisdom is unlikely to be recovered;⁸³ in which case, access to traditional solutions for future pastoral dilemmas will not be possible, despite whatever recognized value is attributed to this knowledge in the future.

This observation is not meant to be an indictment of the agents that have introduced external ideas and paradigms to these communities. As discussed elsewhere, culture and knowledge are dynamic, changing according to the needs of the communities that share them.

Provided people can choose, education, religion and other influences simply provide communities with a greater range of opportunities for increasing their well being or mitigating vulnerability. Rather, this observation is to note the fragile nature of oral traditions and that when considering the different tools available in addressing drought or sources of community distress, ‘traditional’ knowledge should not be discounted by external agents or discouraged from being explored by communities.

Knowledge vs. Information

Traditional knowledge of drought, medicine, and the environment are dying at increasing rates as people look to what they believe are more legitimate sources of information. Lacking sophistication in medium, but certainly not content, oral traditions are being left behind as younger generations look elsewhere to build their future. The languages of oral traditions are not the same as those used by national elites in commerce, education, or politics. As a result, these traditions are perceived to lack the importance and/or credibility of knowledge from other sources. As an example, the increasing intervention of relief in communities makes knowledge of English and Western norms more important as a source of power within communities. Because this knowledge is acquired through formal education, it fosters the perception that knowledge acquired through formal education is superior to traditional knowledge passed on by elders.⁸⁴ This undermines the position of elders within the community as they are sought less for advice on community activities.

What is increasingly apparent, however, is that traditional knowledge is a valuable resource, legitimate if not for its longevity, then for the process of evolution it has undergone over the centuries to acquire its present form. Traditional knowledge and strategies are specific to people and communities – as people moved from one place to another, these traditions further evolved over time to suit their new environments.

⁸³ It is ironic that in a world where large amounts of information may be easily transferred over vast distances at growing speed, knowledge in pastoral communities increasingly fails to pass from one generation to the next within a single community.

⁸⁴ This also undermines the position of elders within the community as they are sought less for advice on community activities.

The time element is important, because it allows information to be synthesized and adapted into the context of local environments. Non-traditional sources of knowledge are increasingly applied to foreign communities where they may be invalid or lack social legitimacy. Taken out of the context where they were developed, these strategies are likely to be ineffective. This is not to say that these sources of information or development are bad, only that a 'universal solution kit' can be ineffective and worse, dangerous. Not all people adhere to the same social norms. Likewise, not all physical environments have the same resources or constraints. Both social norms and the physical environment taken together determine the nature of the strategies communities employ. Because foreign strategies are unlikely to share both characteristics in local context, sustainable or effective practices in one environment may not translate effectively to others.

Traditional knowledge is relevant to development or relief interventions because it embodies the norms and available resources specific to communities where this knowledge is practiced. As a result, traditional strategies provide some insight in to what may be effective given the environment particular to a community. People intervening would do well then to consider their strategies and objectives in relation to traditional strategies and their respective communities. This, however, may prove increasingly difficult, as sources of traditional knowledge grow scarce.

Yesterday

Elders of Kenya-Somali communities have always safeguarded traditional knowledge. Because of the importance of rain in the lives of pastoralist communities, people with detailed knowledge of rain and drought indicators were (and continue to be) respected for their knowledge. Frequently, they are taken a gift of milk or *bun* and consulted on the likely nature of the coming rain season.

Some elders consider foreknowledge of rain or drought to be a hereditary gift.⁸⁵ Others indicated that it is simple knowledge passed from one generation to the next. Most probably it is a combination of the two, as some people are naturally more observant and sensitive to their environment than others and as a consequence are better able to employ traditional knowledge. Whatever the transfer mechanism, many communities agreed that access and respect for this knowledge are waning, supplanted by urbanization, western lifestyles, education, and religion. That said, pastoralists in more rural areas continue to practice this traditional knowledge and in these communities this knowledge continues to be held in high regard.

Today

Youth today are increasingly absent from pastoral lifestyles, preventing knowledge of pastoral practices from being passed to them. This absence is due in some cases to livestock destitution and others to the system of formal education. In addition, drought interventions by government and non-government agencies have proven more effective at reducing human mortality among pastoral populations. As a result, some 'traditional' practices have fallen into disuse, especially in and around administrative centers. Given the perception that this external assistance is a long-term commitment to these communities, relief food and services have effectively replaced other drought coping strategies.⁸⁶ Unfortunately, because most of this knowledge is preserved only in oral tradition, this likely amounts to the permanent loss of this resource as older generations pass away without imparting their wisdom.

Religious fundamentalism of the past decade has also contributed to the declining practice of traditional knowledge and drought indicators. People are no longer consulted, or prefer not to share their knowledge, because this practice is misconstrued in some communities as 'predicting the future', an act prohibited by

⁸⁵ Divination such as *funno* is considered to be a gift, *raag*, which may be hereditary.

⁸⁶ This is a positive development, assuming that the government can continue to fulfill its obligations as a manager of state resources. In many countries, this and formal insurance schemes are the primary coping strategies employed by people facing emergencies.

the Koran.⁸⁷ In truth, many of these indicators are not predictions, but forecasts based on observations of weather patterns and the behavior of animals that logically precede precipitation. Traditional rain indicators provide information that is no different than data obtained via satellites and atmospheric observation stations to evaluate changes in humidity, barometric pressure, and wind speed over time. Though not quantitative, the conclusions obtained from traditional knowledge are the same as those disseminated as weather forecast on nightly news broadcasts, after scientific data has been compared against historical trends. In some cases, traditional knowledge may even predate contemporary forecasts by a couple of weeks.

Tomorrow

In developing education, health, and other services in the area, it is important to consider that centralized facilities mean pastoralist populations must leave their livestock and livelihoods to access these services. For education especially, this means the long-term loss of labor and perhaps the permanent loss of traditional knowledge and pastoral systems learned through apprenticeship. Perhaps alternatives that support pastoralists and their mobility might be more appropriate, increasing participation and production.

⁸⁷ Traditional knowledge and its empowerment of elders within the community may be viewed as competing with the role of religious leaders in the community and so traditional beliefs and practices discouraged.

The Future of Pastoralism

Mobility is the single most important strategy available to pastoralists for mitigating the impact of drought. Mobility allows pastoralists to continue their livelihoods with minimum livestock losses – livestock in this case translates into social security, income and food security.

Development strategies that promote sedentary behavior, regardless of intent, undermine the key resource of mobility. This type of development also empowers specific people within the community, which may be at odds with traditional leadership structures. The disempowerment of traditional leaders means that traditional means of conflict resolution and grazing management schemas may be threatened.

In discussing the future of pastoralism with community elders, three major issues were suggested as undermining pastoral livelihoods. These are formal education, the development of superfluous water sites, and the development of administrative centers. I argue that agricultural development, outside of riverine areas, may also be added to this list of unsustainable development strategies.

Formal classroom education

A concern expressed by communities was that formal education fails to meet their needs because of inaccessibility and poorly suited curricula. With regard to the former, the movement of pastoral populations with seasonal grazing patterns makes it difficult for children to attend school.

Attendance eliminates the pastoral workforce in two ways. First, children are expected to be the primary herders for shoats. Likewise, the responsibility for herds of camels and cattle generally falls to older youth. If children and youth are enrolled in schools away from livestock herds, then this labor pool is lost.

Secondly, vocational training is eliminated when children are separated from herding practice by school enrollment. Because children are not herding shoats or other livestock, they are unable to acquire the livestock management skills they will need in the future. The same can be said for knowledge of traditional early warning systems and coping strategies. Youth are unlikely to undertake the process of vocational training upon completing their school certificate and returning to pastoral communities. As a result, these youth are unable to effectively undertake pastoral livelihoods, thereby reducing their ability to earn a living. The absence of labor opportunities in urban areas makes this situation even more difficult.

The curricula taught in schools similarly affects available sources of labor because they fail to incorporate pastoralism into their framework. Given the large pastoral communities in Kenya, it does not seem unreasonable that the curricula for these areas should be tailored to better suit the practical needs of these groups and the semi-arid environment where they live. **In sum, the vocational skills lost in attending school are not effectively replaced.**

Moreover, formal education imparts the need to apply the basic skills that it does teach. These same institutions also bring their ethos to bear, promoting social norms and values that they esteem. So long as these systems of education fail to promote pastoralism in their curriculum, it is likely that graduates will leave pastoral areas in search of employment where their skills may be applied and where their values are more comfortably accepted. This has a negative impact on the communities they leave; who lose not only the labor resource and social capital invested in these individuals, but their ability to negotiate with external institutions.⁸⁸

⁸⁸ In addition to using English, government and non-government agencies have their own ‘norms of communication’. That is to say that they use diction and processes of communication that are separate from those employed in everyday conversation. These forms of communication are the same ones that are taught through formal education. Thus, the loss of individuals schooled in formal environments means reduced advocacy on behalf of these communities.

The question is not should schools be eliminated because they may adversely affect labor pools. It is instead, **‘How can the curricula and structure of current educational institutions be modified to suit training and scheduling needs of pastoral communities?’**⁸⁹ The response by the Ministry of Education must necessarily take into account the reality of child labor in these communities and work to accommodate it rather than deter it altogether. Such labor not only provides a much-needed resource, but also serves as vocational training for children in these communities. **For this reason, the curricula and structure of education in pastoral areas should seek to supplement these practices rather than supplant them.**

Development of water resources in wet season grazing areas

The development of water resources in wet season grazing areas increases the likelihood of permanent settlement. As discussed later, this is likely to lead to environmental degradation near these areas, as pasture is not given the opportunity to regenerate. This also disrupts traditional wet and dry season grazing patterns. The net result is that pasture resources are unavailable in these areas in times of emergency.

The development of water sources, like administrative centers, is a controversial point. While some communities expressed that excess water points should be eliminated to encourage grazing patterns that better conserve and manage available pasture, many others listed lack of access to water as one of their primary concerns. The difference in responses may have something to do with the context of these contradictory statements. Communities experiencing a net inflow of livestock and population from areas with more limited livestock inputs (resulting from increased drought severity or fewer initial endowments) were more likely to link the increasing number of water points to increasing rates of degradation and a current scarcity of livestock inputs. The logic behind this is that in the absence of additional water points, such immigration would be reduced along with its resulting stress on the local environment. Communities experiencing a net outflow of livestock and population on the other hand, were more likely to express concern over the lack of water sources for all needs.



Does this mean that available water sources should be increased in some areas and decreased in other areas? Not necessarily. While some communities may suffer due to a lack of water resources in the current drought, they may not in future ‘droughts’. **Building drought-bearing capacity among communities needs to be weighed carefully against the possible negative spillover effects on the availability of other resources such as pasture.**

Administrative centers



Communities most cited administrative centers as reason for the decline of available livestock inputs. Administrative centers encourage environmental degradation because permanently settled populations place additional and sustained stress on resources in these fragile semi-arid ecosystems. Whereas mobile populations regularly shift, allowing for vegetation regrowth,

permanent settlement does not. Harvesting of wild foods and trees to be used for both building materials and firewood, as well as clearing land for longer-term agricultural production reduces the quality and quantity of resources available in the vicinity of administrative centers. In addition, consumer markets formed with permanent settlement encourage more mobile populations to frequent these areas to sell milk or access services. This further exacerbates environmental degradation in and around settlements. **The centralized distribution of relief food has a similar impact on the resource environment in and around administrative centers.** On this point, more thought needs to be given to how stress on the environment can be reduced when outlying groups access relief services/goods distributed from administrative centers.

Simply translated, environmental degradation means the long-term loss of pasture and browsing foliage available to livestock. Because administrative centers are likely to be positioned near permanent water points, in dry months or drought, the trekking distance required of livestock between pasture and water is significantly increased. This contributes to declining livestock constitution and increased livestock morbidity. More contentious is the reallocation of water or other resource rights by government appointed administrators aiming to further develop the centers under their control e.g. water sources traditionally used by livestock are reallocated to schools or health centers for their needs without available substitutes for livestock. If pasture and water resources are inaccessible, then the well being of livestock, and by extension livestock markets and pastoralists, is reduced. Permanent degradation of these resources also limits the development of future livestock markets and the region.

The question of government appointed administrators and their impact on pastoralism and general development policies is in fact another major concern to communities. One reason is that people living within administrative centers can more easily access government institutions to advocate their interests than can pure pastoralists who often live outside the confines of administrative centers. Also, center inhabitants are more likely to share the 'development' concerns of local administrators. Stronger advocacy positions and shared development concerns mean that populations in administrative centers are more likely to successfully lobby for development policies than pure pastoral groups. While their policies may directly benefit center inhabitants in the short-term, they may be contrary to the interests of mobile populations, possibly restricting their access to water or other livestock inputs. **Ultimately, because these economies depend on livestock, these development strategies hurt both groups living in and outside of administrative centers.**

Increasing settlements in and around administrative centers also further empowers government appointed chiefs who have limited accountability to the communities they manage. If current government development practices unintentionally discriminate against pastoralists, then local development decisions are likely to do the same. Elders are disempowered and their traditional roles undermined because community decision-making is vested in a government appointed official rather than the elders of the community. The disempowerment of elders in community affairs naturally contributes to their disempowerment in other areas like dispute settlement and grazing management. (Western education and religion have similarly contributed to this process.)

Because government appointed chiefs are not perceived to be legitimate intermediaries nor can they speak for the collective communities within their division vis-à-vis grazing patterns or livestock movement, and because these roles are outside of their mandate and scope of responsibilities, a power vacuum of sorts is created with regard to traditional pastoral practices and management. In other words, if administrators have usurped the traditional authority of the elders, then no strong, legitimate voice exists within the community to regulate these practices and the misuse of grazing areas and community water sources is encouraged. Furthermore, in times of drought, the capacity of elders to negotiate grazing rights on behalf of groups is limited.

When the misuse of public resources results in conflict, this problem again arises, as conflict mediation is traditionally the domain of the elders of the community. If administrative chiefs are not perceived as the legitimate source of **social** authority in the community, then they cannot effectively negotiate settlement and peace. Traditional social structures of justice and restitution do not carry their former authority and are

therefore difficult to undertake. With the absence of the disincentive provided by traditional fines⁹⁰, ‘self-help’ strategies are promoted. Once reduced, this authority cannot be easily reinstated and elders empowered to mediate and/or adjudicate between parties.

Fortunately, the increasing use of community based relief and development strategies appear to be an effective means of offsetting this shift in community power structures. Two examples of strategies employing a community-based approach are the Arid Lands Range Management Program (ALRMP) and community elected relief food committees.

Another concern is continued development through the expansion of the number of administrative centers in the province because this increases the likelihood of development in marginalized areas i.e. areas without permanent water sources. This expansion endangers the well being of some groups because, in times of drought, inhabitants of these population centers may not have access to water. Given that relief food often requires water for cooking, the absence of a permanent water source and prohibitive water transport costs also reduces food security, regardless of distribution coverage.⁹¹

Lastly, the presence of administrative centers may encourage misperceptions that the needs of pastoral populations are being adequately met. Because the needs of mobile populations are difficult to evaluate, external agencies are likely to use populations in administrative centers as a proxy for needs assessment. Unfortunately, the concerns in administrative centers may not accurately reflect those for mobile pastoral communities. As a result, relief or development strategies may be misdirected and the needs of mobile pastoral groups unmet, especially if these populations are unable to access services available only in administrative centers e.g. health, education, relief food.

However, the question of administrative centers is a complicated one. While administrative centers do undermine traditional authority and erode traditional resource management schemas, they also provide essential services to these communities. They serve as an important channel of communication between communities, external organizations, and government, both at the district and national levels. Administrative centers allow the government to more effectively fulfill its obligations to these communities in the form of public goods and services. In times of distress such as drought, they also provide an essential point of contact for the assessment and distribution of emergency services.

With regard to the economy, administrative centers provide markets for livestock and livestock products. This role is essential in diversifying the economy of the region and promoting food security. Administrative centers also serve as a meeting point for communities, facilitating political mobilization and collective action. In their absence, the voice of these communities would be considerably weakened and possibly ignored.

Over the past half-century, administrative centers have been integrally woven into the landscape of these regions, providing essential services to the people living in pastoral communities. Given their role in supporting pastoral communities, the question becomes one of, ‘How can administrative centers better support pastoral institutions while continuing to serve the needs of both government and these same communities?’⁹² The most obvious answer lies in reconsidering their leadership structure. If the administrative chief were elected by the community rather than appointed by the government, would it make a difference? Would an elected administrative chief possess the necessary administrative skills to manage the area and represent both community and government interests?

Through the course of the current drought, communities, government officials, and NGOs have considered locally elected relief committees relatively successful in administrating relief interventions. In most cases, the individuals elected to these committees by communities appear to have achieved some level of formal education. This means that communities recognized education as being an important quality for effectively

⁹⁰ Colonial administrations used to permit the operation of traditional courts and supported their punitive decisions.

⁹¹ Action Against Hunger, 2001 Mandera Report

⁹² Yacob Akililu, *personal correspondence*, Tufts University & OAU-IBAR, 2001

administering relief interventions. While these leaders were likely to have a different set of values from the community, inculcated by formal education, they also shared values by virtue of their longer-term membership in these communities. It was in fact the different values and modalities of communication that make these candidates attractive⁹³ and allowed elected relief committee members to bridge community, government and NGO interests to represent and communicate the needs of each.

What is the difference between these committees and government appointed chiefs who must necessarily conform to these same criteria? The answer lies in their accountability and orientation. A government appointee is likely to look first to the interests of government and then community; whereas an elected administrator is likely to look first to the body whereby he or she was empowered i.e. the community. In the case of the latter, it is probable that the voice of traditional leadership will play a role in administration, as community accountability encourages community involvement and consensus building in the decision making process. In this respect, the relief committees have shown themselves effective, accountable both to the communities by whom they were elected and the NGOs with whom they worked. This may then serve as a starting point for developing a leadership structure for administrative centers that represents the needs of both community and government, and supports traditional resource and community management schemas.

Promoting agricultural activities outside riverine areas

Development in semi-arid regions that promotes agriculture outside riverine areas is unsustainable and discourages pastoral practices. It is unsustainable because agriculture requires high water inputs, which are not consistently available in these areas.⁹⁴ This stresses already limited water sources.⁹⁵ It is uncertain whether groundwater recharge or extraction rates are sufficient to support the additional burden of agriculture water use. This in turn reduces the amount of water available for livestock and human populations. Water harvesting (i.e. importing goods that require high water inputs and producing goods with low water inputs for exchange⁹⁶) would be a more economic use of these limited water resources. Furthermore, this region has a distinct comparative advantage in livestock production i.e. livestock can be traded for more grain than can be produced over the long-term in these areas, provided the existence of markets to promote positive livestock to grain exchange rates

In addition, agriculture also requires that land be cleared for cultivation and settlement. This eliminates browsing flora around permanent water sites. As discussed under administrative centers, this process is also likely to result in changing patterns of water access. Farmers are likely to be able to better advocate for water use, leading to declining access to pastoral groups.

Also uncertain is whether the soils of this region can support sustained agriculture. These plains may lack the nutrient richness and the capacity to replace extracted nutrients that alluvial areas possess. The soil in many areas is sand based, implying that there are very high filtration rates. To move water along unlined channels over long distance may not be effective given the water loss to the soil in transit – before use by crops.

Lastly, agriculture, permanent settlement and development promote private land rights, which is in direct opposition to the communal land rights necessary for pastoralism. Precedence for this lies in traditional water rights within the region. Historically, because earth dams were developed by individuals, these water sources were considered private property with the ‘owner’ limiting access to them. Agriculture is likely to

⁹³ The language and values of formal education are similar to those shared by government and NGOs allowing for more effective communication and appeals to donors.

⁹⁴ That is not to say that agriculture cannot be practiced in these regions. In a good rain years, rain fed farms in some areas are able to produce good grain harvests.

⁹⁵ Because the Daua is a seasonal river, irrigation may have particular impact on downstream water users.

⁹⁶ Luke Ney, *An Empirical Assessment of Virtual Water*, Ph.D. Dissertation, Fletcher School of Law & Diplomacy, 2000.

have a similar result on land rights, further restricting the pasture available to pastoralists and their livestock.

Conclusions

Most elders surveyed in the pastoral communities agreed that, given the present rates of livestock destitution, the increased frequency of drought, and the growth and development of administrative centers, the future of pastoralism is grim. With this in mind, should pastoralism be supported? The answer is 'yes' for the simple reason that pastoralism is the most efficient means of using resources that are available in arid and semi-arid lands. Livestock, especially browsers like shoats and camels are well suited to areas with lower rain yields. The limited water sources available outside riverine areas and the frequency of rain failure make agriculture an unattractive alternative. Crops cannot migrate if rains fail, leading to crop failure and the onset of food insecurity. Other forms of income generation are extremely limited. This is a cause for immediate concern because the high rates of livestock destitution in the wake of the droughts of the 1990s have pushed many people out of pastoral livelihoods, leaving them with no alternative means of earning income. High livestock losses and lowered recovery capacity of the environment have incapacitated traditional restocking mechanisms and support for these groups. Action needs to be taken by external agencies to promote viable livelihood strategies among these groups. This type of strategy will help to circumvent longer-term issues of dependency.

Similarly, agencies should reconsider the welfare of pastoral livelihoods within their development and emergency intervention frameworks. These initiatives must seek to support mobility, access to resources, and traditional leadership whenever possible to ensure that sustainable and traditional coping strategies can be employed. Traditional practices have been undermined by a policy of development in the Northeastern Province that led to an increase in the number of settlements. In turn, this has crowded out wet season grazing areas and restricted livestock access to permanent water sources in dry season grazing areas.

Regional administrators must look at the current settlement patterns and make some difficult decisions as to whether future watering points and administrative centers should be discouraged to promote traditional grazing management practices and livestock conditions. Relief agencies can contribute to this process by developing a strategy of relief distribution that moves outside administrative centers to forestall migration to these areas by pastoralists who have too little livestock to survive independently of food aid. By distributing relief mostly in administrative centers, these vulnerable pastoralists are encouraged to leave their small stock behind or take it to over stressed environments in order to access relief food – either choice endangers the future livelihoods of these vulnerable pastoral groups. Distributing relief food and services to satellite communities may allow this group of pastoralists to stay in areas that can better support their livestock and futures.

The current systems of education and leadership in administrative centers also need to be reconsidered. Education in pastoral areas should take into account the reality of children's roles in herding and develop curricula that are practical both in terms of content and accessibility. This is likely to mean stepping 'outside of the box' and exploring creative solutions to overcoming the obstacles that pastoralism presents to formal education. With regard to administrative centers, the Government may want to trade some of its control via government appointed representatives for the gains in community participation through elected administrative chiefs that is likely to result in the improved efficacy of development.

Development programs that focus on the strengths of the region – promoting livestock support services and markets, as well as the limited agricultural potential along the riverine areas⁹⁷ - are needed. What will the people in administrative centers eat when rains come and pastures green if their livestock and youth are

⁹⁷ By development here, I mean privatized development by individuals using micro-credit for industrial agricultural inputs with reasonable repayment schemes and the facilitation of the formation of community cooperatives to manage contracts (emergency fodder or other), negotiate with traders to establish favorable crop prices, provide storage facilities, and collectively purchase more capital intensive equipment. Given the entrepreneurial nature and traditionally egalitarian decision making processes of Somali culture, cooperatives may work well.

gone, hamstrung by unsupported livestock markets, poor transportation networks, and imperiled resource management systems? If pastoralism and livestock marketing were supported in the region, it is likely that the Kenyan economy as a whole would benefit. This means aggressively pushing into regional markets like those in the Near East. Improving access to financial and terminal markets would encourage liquidity, savings and the consumer base available for domestic goods. It would also help pastoralists to diversify and transfer assets in anticipation of emergencies such as drought. Investing in pastoralism is good not only for pastoral communities, but for Kenya as a whole.⁹⁸

⁹⁸ This is especially true if livestock in ASAL areas represents 19% of the Kenyan economy – 25% livestock based wherein 75% of all livestock reside in ASAL areas.

Appendices

Appendix 1: Gurre and Muralle Indicator Confidences

STRENGTH ⁹⁹	INDICATOR	CONFIDENCE
1	Bararato (Unidentified Bird)	78%
2	Cattle (Late Hagai)	72%
3	Camel (Late Oreheed)	68%
4	Deroy (Morning Clouds)	83%
5	Obora (Heavy Rain)	48%
6	Moon & Sun	45%
7	River Daua	85%
8	Sololeya (Guinea Fowl)	65%
9	Lakaam (Bustard)	55%
9	Raha, Rach (Frogs)	55%
9	Tuqa-Biifa	55%
12	Cattle (Early)	100%
12	Dubeis	100%
14	<i>Miiri</i> of Birra	90%
14	Uldude	90%
16	Chickens	70%
16	Night Weather	70%
18	Koh (Wind)	50%
19	<i>Miiri</i> of Adoles	30%
19	Stars	30%
19	Tololia (Wind Funnel)	30%
22	Bees	20%
22	Gonduleis	20%
22	Mot	20%
22	Tuqa	20%
26	<i>Funno</i>	10%
27	Koro-Guet	0%

⁹⁹ The ‘Strength’ of each indicator was determined weighting each confidence value by the number of communities that introduced it as a drought indicator. Thus, even though some indicators may have a higher average confidence given, their strength as drought indicators is lower because they were not widely employed. The logic behind this distinction is that indicators with wider application and familiarity are likely to be stronger indicators.

Appendix 2: Kenya-Somali Astral Calendar System
Musa Guliya Mohamed, 64 years, Mandera 21 July, 2001

Group	Night	Name	Gu *	Dreer	Hagai	Oreheed	Good Stars **	Rain Value ¹⁰⁰
Gothon (Deer)	Sunday	Gothon	Y	Y				3
	Monday	Listam	Y					1
	Tuesday	Urur	Y				Y	5
	Wednesday	Adad	Y					4
	Thursday	Agali Ad	Y				Y	4
	Friday	Agali Gudud	Y					3
Ambaar (Oreheed)	Saturday	Afagal	Y					3
	Sunday	Ambaar		Y		Y		5
	Monday	Naaf Mathoba		Y		Y	Y	4
	Tuesday	Afghoys		Y		Y		2
	Wednesday	Mijin				Y		1
	Thursday	Kohdin				Y		4
Garba (Hagai)	Friday	Nasagaal ⁺		Y		Y		5
	Saturday	Dirir	Y	Y				5
	Sunday	Garba			Y			3
	Monday	Bayahau			Y			3
	Tuesday	Gudban			Y			1
	Wednesday	Lip-as			Y			3
Farur (Gu)	Thursday	Marega ⁺⁺			Y			3
	Friday	Horr			Y			3
	Saturday	Damara Lajog			Y			1
	Sunday	Farur	Y	Y			Y	5
	Monday	Jid Dirighle	Y	Y			Y	5
	Tuesday	Jid Kabare	Y	Y			Y	5
Farur (Gu)	Wednesday	Rab Hore	Y	Y			Y	4
	Thursday	Rab Dambe	Y	Y			Y	4
	Friday	Miad Dargane	Y	Y			Y	4
	Saturday	Miad Yibile	Y	Y				2

* Star is relevant to this season; ** Star is considered good for rains

⁺ First new moon of *Gu (Gan)* 2001; ⁺⁺ First new moon of *Deer (Agay)* 2001

According to this system, Lip-as is the star that will rise with the new moon, predicting the *Deer* 2001 rains. However, Lip-as is not considered relevant to the *Deer* season and cannot be used.

Nasagaal is the star that should have risen with the 2001 *Zakad* moon, indicating good rains for the year 2001.

ADDITIONAL NOTES	
<i>Deer</i> Stars	Diseases & Abortion for Livestock
<i>Oreheed</i> Stars	Good for Livestock – No Diseases
<i>Hagai</i> Stars	Many Diseases & Lack of Milk
<i>Gu</i> Stars	Good for Livestock
<i>Garba to Horr</i>	Bad for Human Health

¹⁰⁰ *Rain Value* indicates the quality of the rains expected for that season.

1. Very Poor, 2. Poor, 3. Normal, 4. Good, 5. Very Good

Appendix 3: Clan Oral Histories

The following are compilations of oral histories from a limited number of communities. The events are local in context and unrepresentative of clans as a whole – although wider events are shared between communities and clans. These are intended to provide an example of the ways in which oral histories are recounted. Given the social wealth of the information contained in the oral histories of the community, I encourage a more comprehensive record be undertaken before this information is lost.

Adjuran Oral History

YEAR	Name ¹⁰¹	TRANSLATION	CLIMATE	Comments
1897	Chinn Tite Guracha (1)	Fly(Insect) Bringing Death of People	Drought	Before the drought these flies arrived in mass. After one month, they died and severe drought followed. There was no government to assist. People ate even soil, tree bark, arrow root, etc. Animals died, people died. The footprints of animals were said to only be found in 3 places: Wajir, Dire, and Batelo.
1931	Ola Kolaji (2) Qumuch	Drought of Skin	Drought	Animals were dying quickly and the only thing that could be consumed from the wasted carcasses was the skin. There was no meat to eat.
1957	Naqar Jit (3)		Drought	Livestock were dying and the skin was important as this could be sold to Arab merchants to buy food stuffs in Wajir. The skins were weighed and exchanged for 80 KSh/ hide (cattle).
1962	Talaatha Deer Shuban	Tue. Short Rains of Diarrhea	Rain	Much rain, but also sickness
1970-1971	Ola Kamis Odi Kawein	Drought of the Thu. Beyond the Elders	Drought	Elders who can predict rain did so, but the rain failed. Thus, this drought was beyond even their scope. There was a cholera outbreak in this same year. It was also the first year of relief food from the Kenyan government.
1973	Septi	Sat.	Drought	There was a total eclipse of the sun this year along with drought.
1984	Talaatha	Tue.	Drought	
1991	Arbaa	Wed.	Drought	Also clan clashes

¹⁰¹ Numbers reflect the severity of the droughts recorded, with (1) representing the worst drought in memory.

1992	Drought			
1997	Deer waley	<i>Mad Deer</i>	Rain	El Niño impact was more like a drought than flood as it caused the death of many livestock.
1999	Kamis			Current drought
2000	<i>Jim'a</i>			Current drought
2001	Septi			Current drought

Corner Tribes Oral History

Year	NAME	TRANSLATION	CLIMATE	Comments
1927	<i>Jim'a</i> Lafole (1)	Fri. of Bones	Drought	People were eating bones after boiling them. Animals wasted away and died during the course of the drought, the bones were all that was left to eat.
1932	Ahad Hanaf/La Fatum	Sun. of Strong Hunger/Grinding	Drought	Even bones were ground up and eaten
1952	Kamis Kufa	Thu. of Destruction	Drought	People and animals died
1955	Septi Shushub	Sat. of Hand-Irrigation	Drought	People ran away from their families and wives to save themselves
1959	<i>Jim'a</i> Silei (2)	Fri. of <i>Silei</i> Grass	Drought	The <i>silei</i> grass grows seeds that are collected and ground to make porridge or cooked. Even people in Somalia experienced drought this year (Luk) and grain was either unavailable or unaffordable. One goat was sold for one shilling, while its hide could be sold for three. Animals were slaughtered and sold only for their skins to buy grain.
1960	Ahad De Qoien	Wet Ahad	Rain	
1965	<i>Jim'a</i> Pasta	Fri. of Pasta	Drought	Pasta was available in Bulahow, Somalia as relief food and people rushed there.
1965	<i>Jim'a</i> Pasta	Fri. of Pasta	Drought	Relief pasta was available in Somalia
1970	Kamis Da'uun	Kamis of Cholera	Drought	
1976	Kamis Habat (2)		Drought	Migrated to Galana River in Ethiopia. Many animals died from rinderpest and drought in this year.
1980	Ahad Bea-hiren	Ahad of Floods	Rain	
1981	Ahad Dilmanya	Sun. of Mosquitoes	Rain	Very Heavy Rains
1991	Kamis Galas Kat (3)	Thu. of Containers	Drought	People took <i>galas</i> to Mandera to beg for food

1997	Arba Ninio	Wed. of El Niño	Rain	Very Heavy Rains
1999	Septi Dikibei (3) or Sughai (1)	Sat. that Persists (Stays with you); Hope	Drought	There is continuously hope for rain.

Gurre Oral History

Year	Name	Translation	Climate	Comments
N/A	Talaatha Lon Borana	Tue. of Borana cattle		Gurre vs. Borana War. Many cattle were brought from the Borana
1899	Talaatha Burte	Tue. of Yellow Fever		People and animals died of yellow fever.
1904	Ahad Aara	Sun. of Smoke/Fog		Many of the of the late Gurre leaders were born in this year, making it unusual
1910	Septi Aduun Doot	Sat. the Sun Died		Eclipse
1916	Gumaad Olki-Aalan	Fri. of Alan and War		Gurre vs. Muralle war, Muralle leader Alan was killed in the war.
1917	Septi Qaluun Ijabat	Sat. that Sheiks Were Killed		Gurre sheikhs were killed in Ramu by Degodia
1919	Isnin Ali-Bukei	Mon. of Ali Bukei		Marehan/Gurre War
1922	Kamis Nyatu	Thurs. of Eaters	Drought	People reached stage of slaughtering water transport animals as all other available livestock had either died or was previously eaten.
1926	Kamis Talyani	Thu. of Italians		Italians came to the Horn of Africa
1927	Talaatha Qawei	Tue. of Thunderstorms		
1928	Gumaad Qando	Fri. of Malaria	Rain	
1929	Kamis Awanisa	Thu. of Locusts		Locusts finished everything, grass, etc.
1930	Gumaad Gababa Abba Gufu	Fri. of Gababa		Gababa, Gurre leader who refused British taxation and moved with many followers to Ethiopia 79 years ago. This is how the Gurre arrived in Ethiopia. Other people stayed but refused to pay British tax and were killed by the British.
1931	Septi Adan Garacho	Sat. of Adin Garacho		Gurre leader who died a natural death in this year.
1932	Ahad Olki Guba	Sun. of War of Guba		War of Guba, between Gurre and Boran
1933	Isnin Lagogsa	Mon. of Dry Throats	Drought	

1934	Talaatha Lagi-Yaai	Tue. of Floods	Rain	
1935	Arba'a Baga	Wed. of Smallpox		
1936	Kamis 'of Italian War'	Thu. of Italian War		War between Ethiopians and Italians
1938	Septi Ola	Sat. of Drought	Drought	
1942	Arba'a Sankol			British DC Mander, Sir William Care, killed in 1942 at Gather
1943	Kamis Buyes Jagaheer	Thu. of Shaved Heads		Reference to the Italian soldiers that remained and harassed pastoralists (shaving of head in military style).
1948	Talaatha Malippo	Tue. of Compensation		Ethiopians invaded Gurre and British disputed on behalf of Gurre, resulting in compensation being paid to the Gurre of Kenya.
1950	Kamis Ali Abdi	Thu. of Ali Abdi		Gurre vs. Marahaan war. Gurre ugas was killed named Ali Abdi
1953	Ahad Taa	Sun. of Ticks		Very strong ticks this year killed many livestock
1957	Kamis Taiye	Thu. of Taiye		Ethiopian administrator that starved Gurre community through taxation and oppression.
1964	Kamis Wera			Gurre vs. Degodia war
1971	Kamis Godana	Migration to Garissa	Drought	Migration due to drought – some people continue to live in Garissa and Tana River.
1971	Kamis Ola	Thu. of Drought	Drought	Many Gurre went to Ethiopia and many livestock died.
1973	Septi Adun-Doot	Sat. the Sun Died	Drought	Eclipse
1978	Kamis Olkil-Abarti	Thu. of Drought-War	Drought	Gurre vs. Borana war + drought
1981	Septi Ola	Sat. of Drought	Drought	
1985	Kamis Abarti	Thu. of Drought	Drought	Drought only
1986	Septi Gaali Dale	Sat. of Camel Milk	Drought	The camel produced much milk, despite the drought.”

1991	Kamis Briisa	Thu. of Rice	Drought	Rice was received as relief food. This is the second worst drought in living memory
1996	Talaatha Bono	Tue. of Relief Cards	Drought	Islamic International Relief Organization gave cards "bono". This is the third worst drought in living memory
1998	Arba'a Elino	Wed. of El Niño	Rain	In this year, there were severe floods and disease. The grass grew high, but nothing has grown since.
2001	Septi		Drought	This is the worst drought in living memory. After that, 4 consecutive years of drought which have never seen before – this is unusual as previously, 10 years cycles, etc. but not consecutive years!

Muralle Oral History

Year	NAME	TRANSLATION	Climate	Comments
1921	Jim'a Alen	Fri. of 'Alen'	Rain	Alen was the leader of the Muralle during this year of conflict (war) with the Gurre. It was also a year of heavy rain.
1934	Arbaa Damas	Wed. of 'Damas'	Rain	<i>Damas</i> is a pond on the Somali border. Very heavy rains and flooding made it difficult to differentiate between the water level in this pond and adjacent fields.
1938	Septi Aingos	Sat. of the Camel Harness	Drought	People tried to migrate to Ethiopia. However, as they attempted to cross the river, the caravans were turned away. They returned to their settlements. The cutting of <i>aingos</i> symbolizes that they were unable to migrate.
1938	Talaatha Italiani Egypt	Tues. of Italians		The area was occupied by Italian soldiers because of the Italian-British war. The area was later re-taken by the British.
1941	Arbad Qufaa		Drought	Many cattle died and people migrated up to Negele, Ethiopia
1943	Kamis Hapag-guraat	Thu. of Gum	Drought	People ate tree gum as a last resort after they had exhausted their supply of camels.
1947	Ahad Dabarbare UGur	Sun. of Migration to Dabarbare, Ethiopia	Drought	People migrated to Dabarbare Ethiopia because of the drought
1949	Kamis Ali Demdemle	Thu. of Ali Demdemle	Rain	Gurre elder killed by Somali Marahan clan. Heavy Rain.
1950	Jim'a Abar Behei	Fri. Out of Drought		
1951	Septi Buun	Sat. of the War Horn		
1953	Ahad Ghuni	Sun. of Ghuni		Ghuni was killed this year.
1954	Isnin Ebezale	Mon. of	Rain	Very heavy rain
1955	Talaatha Guyo	Tue. of Guyo	Drought	British Sgt. Major that confiscated livestock and arrested many of the people crossing into Gurre clan areas in search of water/pasture.
1956	Dher Orabu (Arbaa)	Wed. of		Muralle who killed his brother.

	Kamis Demer Kugur	Thu. of		Significant year because 46 families were shifted from Ogaden clan area of Wajir by the colonial administration.
1957	Jim'a Da Har	Fri. of Diarrhea		
1958	Septi Wantwale	Sat. of Confusion	Drought	Drought led to irregular patterns of migration, as no one knew where to go.
1959	Ahad Jerjarau	Sun. of Cuttings	Drought	Much dry cold wind with severe drought led to severely chapped skin (i.e. cuttings) – Sheep were slaughtered and the oil applied to people's skin
1960	Isnin Humbawein	Mon. of Milk Froth	Rain	Plenty of rain and milk
1961	Talaatha Ward	Tue. of Elections		Year of independence, division into electorate wards, and voting
1962	Arbaa Geley	Year of Camels	Rain	Year of continued good rains led to higher birth rates among camels.
1963	Kamis Sefla	Thu. of Slaughter (the knife)	Rain	Year of much disease that led to high livestock mortality during the rainy season, especially camel (<i>sef</i> is a short sword)
1964	Jim'a Gebgebaa	Fri. of Curfew	Drought	People wanted to secede from Kenya and join Somalia. Populations were placed in camps
1965	Septi Hedik Sendeer	Sat. of the Comet	Rain	Much rain
1966	Ahad Arar	Sun. of Flight	Drought	People fled to Somalia because of war and drought
1967	Isnin Owlilan	Mon. of 'Owlilan'	War	The Owlilan of Somalia (tribe) declared war on the Muralle
1968	Talaatha Chief Aftin	Tue. of 'Chief Aftin'		Chiefs that had been appointed by the British government were dismissed as they favored secession. Aftin was the first chief appointed by the Kenyan government following independence.
1969	Arbaa Fartaag	Wed. of the Finger		The first time a Muralle contested for the seat of MP. (Previously all had been Gurre) The campaign symbol for this candidate was a raised finger.
1970	Kamis Wajir	Thu. of 'Wajir'	Drought	Many Muralle shifted to Wajir and Ethiopia because of the severe drought in this year.
1971	Jem Ber-Gos	Fri. of Good	Rain	Good rains brought a good harvest of millet

		Harvest		and grain
1973	Septi Oramathow	Sat. that the Sun Died	Drought	Year of eclipse.
1973	Ahad Deradirata	Sun. of Worms		Much of the grass/leaves were eaten by caterpillar infestation
1974	Isnin Hila-waal	Mon. of Great Lightning	Rain	The long rains were delayed until one night it rained enough that everyone was satisfied.
1974	Odu Kuwein			
1975	Talaatha Du Kawein	Tue. Greater Than Old Men	Drought	No one living had ever seen a drought as severe.
1976	Arbaa 'Relief'	Wed. of Relief		Relief was received in this year.
1977	Kamis Der Bes	Thu. of Satisfaction	Rain	The long rains were so good in this year that the short rains were felt to be unneeded.
1978	Jim'a Hagog-fed Jim'a Pikcha	Fri. that the 'Head Scarf was Removed' Fri. of Picture		Year that the head scarf was removed by women to take pictures for identification cards that were introduced in this year.
1979	Septi HisaGur	Sat. of Leisure		People migrated to Fafadun, Somalia for leisure.
1980	Ahad Biyahiren	Sun. of Floods	Rain	Movement was prohibited by heavy rains.
1981	Isnin Qorigaad	Mon. of Bringing Guns	Rain	The Kenyan government undertook a military operation to collect all guns and ammunition.
1982	Talaatha Hassanwein	Tue. of the Great 'Hassan'	Drought	A very well known Degodia bandit from Ethiopia wreaked havoc throughout the area. People survived drought because of rain in the previous year.
1983	Arbaa Bukti	Wed. of Explosions	War	Gurre-Muralle war
1984	Kamis Wajir Gur	Thu. of Wajir Migration	Drought	Migration to Wajir because of drought
1985	Jim'a Harambee	Fri. of Animal Collection		Animals were forcefully collected for the presidential visit and placed in 'camps'. The initial request for these animals was refused.
1986	Septi Jar-Nolai	Sat. of Heavy Rains	Rain	Heavy rains and a good year.
1987	Ahad Dawa-Duba	Sun. of 'Dawa-Duba'	Rain	Crops were grown in Dawa-Duba as this is the best farming area in the district.
1988	Isnin Qabob	Mon. of Cold	Rain	The year was unusually cold and had good

				rains.
1989	Talaatha Boom	Tue. of Bombs		Two bombs were detonated by the well by Somali Marahan bandits. Marahan people attacked Lafey, raiding the area.
1990	Arbaa Garat	Wed. of 'Garat'		Garat was a hard-working, honest man killed by the Marahan in this year. There was no war.
1991	Amakaq	Wonder		
1991	Kamis Aideed	Thu. of 'Aideed'	Drought	Somali Warlord, Aideed, took control of Somalia. (shows importance of Somali events in the lives of Kenya Somalis)
1992	Jim'a Qanda	Fri. of Malaria	Rain	Heavy rains led to a high incidence of malaria in the area.
1993	Septi Gel-Dalai		Drought	Great drought, but many camel produced calves in this year.
1994	Ahad Furuq	Sun. of Smallpox	Drought	Camel and goats died of smallpox.
1995	Isnin Hergeb	Mon. of Pneumonia	Drought	Many camel died of pneumonia during this year of severe drought with disease.
1996	Talaatha Lo-Lais		Drought	The cattle were finished by continued drought
1997	Arbaa Ala Ninio	Wed. of El Niño	Rain	Very heavy rain brought high incidence of livestock disease and mortality. Many trees also died, along with the failure of crops.
1998	Kamis		Drought	
1999	Jim'a		Drought	
1999	Maqal	'We have never heard or seen'		A drought of this duration has never been heard of or seen previously.
2000	Septi		Drought	
2001	Ahad		Drought	

Ogaden Oral History

Year	Name	Translation	Climate	Comments
1912	'Year of Garas'	Year of Garas	Drought	Gersi was cooked and eaten as there were no towns available for grain trade or relief.
<1914	Fuut Aano	Soup of Slaughtered Animals	Drought	Soup of slaughtered animals was given to children. The people were hungry in this year, but the animals survived.
1917	Septi Mahil (3)	Sat. of Extreme Difficulty	Drought	Even people were exchanged for dead carcasses
1919	Go-ai or Gel-Damat	Death of Camels	Drought	
1921	Warfet	Moaning		All livestock died and everyone was crying or moaning because of hunger
1922	Hin Weine	Strong Wind	Drought	A very strong wind blew through this year. People survived severe drought by going for maize in Meru, Isiolo
1924	Biyafuut (1)	Drinking Hot Water	Drought	This is the first year that tea was introduced, and it was taken for survival. (They were using tea as milk because there was no milk available.)
1925	Ola Kolicha	Eating of Dry Skin	Drought	Because the colonial borders restricted movement, people were unable to migrate and their cattle perished.
1926	Qeisi Kura Karis	Tea from Tree Bark	Drought	People boiled the bark of <i>Comiphira Africana</i> for lack of anything but wild foods, tubers, etc.
1928	Kolijale (2)		Drought	All of the cattle died and only the skin of these animals remained. Eventually, these skins were eaten to survive.
1930	'Year of Methubi and Gestur	Year of Rinderpest and Emptied Bomas		Gestur is a disease that causes cattle to lose their horns [rinderpest] and methubi is the emptying of the boma. People were surviving by eating the dying animal, boiling their bones to make soup. When the situation became worse, the people divided themselves into two groups. Some went to the riverine communities who had some maize. These people were termed <i>muqe lafe</i> , those who survived by the spoon. The others took their animals into the bush, surviving on wild foods such as honey. This group is termed <i>masan lef</i> , those how survived by the axe. The latter

				group was more successful in continuing a pastoral lifestyle as the former had to either leave their animals behind, or contribute their <i>animals</i> to the riverine communities who took them in.
<1931	Rimey Khalat		Drought	People were slaughtering even pregnant animals because of the lack of food.
1931	Warek Dere	Long Route	Drought	Because of drought, people shifted towards Dadep. But there was no water there, so they moved again to Barabera.
~1935	Gurres Gurat		Drought	People were eating Garse fruit and boiling the seeds.
1942	Wamo-Idau	Somali Area	Drought	People shifted to Wamo-Idow, Somalia, looking for rain. All of the livestock died there from rinderpest, and people survived on gersi seeds.
1944	Gel-Qalai	Slaughter of Camels	Drought	
1950	Warfadh	Troubled Sleep	Drought	People were unable to sleep because of hunger pains, tossing from one side to the other at night.
1951	Abarta Jim'a	Friday of Drought	Drought	Market price of hides increased in Garissa and these were sold later in the drought for food.
1963	Afmajir	Puzzlement or Wonder	Drought	In the morning, people would find that their livestock was too weak to stand and perished. It was a wonder to behold. People migrated to Somalia.
1966	Aff Majir			
1969	Dau-Uun	Year of Cholera		(see 1970)
1970	Dau-Uun	Year of Cholera		There was a cholera outbreak in Garissa in addition to drought. There was high mortality among cattle and donkeys.
1971			Drought	
1979	Kho Khon Uun	Year of [tree species]	Drought	It was certain that animals were eating only the leaves of this tree, as it was the only food source available.
1984	Furing	[skin disease with lumps]	Drought	
1987	Kotili Galai	Kotili Migration	Drought	People shifted to Kotili during this year. (Many people moved beyond Masalani.)

1991	Septi Kamaharin	Sat. that Remains	Drought	The effects of this drought continue to be felt, as it left many people destitute without livestock. These people are now living in Garissa town.
1992	Kamathi	Wheat Grain	Drought	Wheat grain was given as relief during this drought
1996	Aaf Majir	Twisted Mouth		People's mouths twisted in puzzlement at the rate of cattle mortality in this year.
2000	Present drought			Unnamed as it has not yet finished.

Appendix 4: The New Year

The *Gu* rains of 2001 fell in the year *Septi*, as did the *Hagai* rains of 2000. The new year is generally said to begin with *Deer*, although some traditions place it in mid to late *Adoles*.¹⁰² The question of this date usually encouraged lengthy discussions, likely because celebration of this event is no longer widely practiced.

Celebration of the new year begins with the lighting of fires in front of the *boma* in the evening, as the animals return to the enclosure. Each family would light their own fire, sometimes singing a song of reconciliation and hope for the future... “Mira koyey. Mababan koye. Wanti hamtuun murruk wan ita san koye”, ‘Bring peace. Bring honey. Bad things should be put to rest and good things strived for.’

¹⁰² The Gurre tradition begins the new year with the first full moon or alternatively, the second new moon of *Hagai*, while the Shebeli Tribes indicated the new year begins with *Ban-dambei*.

Ajuran Communities

Griftu Center, Wajir District

8 July 2001

Sheikh Mohamed Noor	76	Abdullahi Mohamed Hassan	57
Abukar Salesa Abdi	65	Abdikarim Mohamed	57
Mohamed Adan	65	Ahmed Sori	57
Musa Osman Ali	65		

Shebele Communities

Gadudiyo Center, Mandera District

6 July 2001

Abdinoor Osman	70	Musa Gure Sahal	55
Abdinoor Mahat	68	Garasow Gure Sahal	50
Abdi Shide Malable	67	Hassan Hussein Nurio	50
Maalim Muhumed Maalim Noor	66	Yussuf Maalim Noor	50
Bukur Shide Malable	64	Billow Ibrahim Ijuye	46
Madey Maalim Noor	64	Muhumed Hassan Abdullahi	46
Ali Gumo Duhulow	63	Siyat Hassan Abdullahi	43
Muhumed Idivis Muslim	60	Hassan Ali Abdille	40
Omar Maalim Noor	56	Ali Noor Muhumed	37
Hassan Shide Malable	55	Hassan Haji Ahid	34

Degodia Communities

Ashabito Center, Mandera

23-24 June 2001

Sheikh Abqullahi Abdille	68	Maow Abdiow Abdi	N/A
Farah Abdulahai Omar	62	Mohamed Ibrahim	N/A
Abdi Ahmed	N/A	Muktar Sheikh Ibrahim	N/A
Gure Jimale Jele	N/A	Yunes Sheikh Ibrahim	N/A
Jimale Abdillahi	N/A	Yussuf Noor	N/A

Griftu Center, Wajir

8 July 2001

Ahmed Dugaw	80	Mohamed Aden	65
Ibrahim Ahmed	70	Shimoy Dugaw Farah	55
Abdi Dahiye	67	Mohamed Abdi Elmi	51
Ugas Abdille	66	Shaaban Ahmed	40

Gabawein Communities

Neboi Center, Mandera District

Thursday, 6 July 2001

Mohamed Hillow Mohamud	74	Alio Hussein Abdiraliman	58
Ali Sheikh Ibrahim	71	Abdiraliman Ahmed Abdulla	47
Manur Salat Abdi	70	Hussein M. Khalif ©	39
Adan Abdille Hassan	66		

Gurre Communities

Emoley Center, Mandera District

Monday, 17 June 2001

Ibrahim Kudana Kilite	95		
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Fincharo Center, Mandera District

29-30 June 2001

Mohamed Sheikh Sele	77	Edin Mohamed Jarso	48
Hurache Mohamed Roba	68	Muktar Osman Barrow	47
Hussein Isaak Hassan	57	Adan Alio Eymoi	46
Abdullah Hillow Mayesa	55	Alow Yussuf Abdi	N/A

Kutoulo Center, Mandera

18 June 2001

Adan Aliyow Suraw	66	Mohand Tache	54
Ahmed Tache	65	Isaak Mohamed	N/A
Alikher Hanan	55	Hassan Kala Ibrahim	N/A

Shimbur Fatuma Center, Mandera District

29-30 June 2001

Maalim Isaak Yarso	78	Ibrahim Hussein	47
Edolow Haji	64	Salat Osman ©	45
Isaak Abdi Gana	64	Hassan Abdi Alaman	43
Abdulai Hussein Garai	62	Adan Alamiso ©	42
Ahmed Ilo	53	Isaak Adan Isaak	42

Sukelaburkei, Ethiopia

17 June 2001

Loko Hussein Godana Halakei	65
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Takaba Center, Mandera

27-28 June 2001

Ali Kalale Huka	78	Hassan Abdi	60
Ibrahim Hessen Mohamed	77	Abdow Maalim Eymor	58
Ahmed Haji Yussuf	75	Alio Ibrahim Abdullah	50
Farehi Issak Hache	69	Abdi Huuey Guraha	45
Hessen Baricha Mohamed	69	Abdullah Adan Asan	42
Abeli Abbey	68	Abdiraliman Abess Sheikh	40
Ahmed Ibrahim Gabale	68	Adan Abdi Hassan	40
Maalim Alinow Abbey	62	Adan Hussein Ibrahim	40

Banisa Center, Mandera

24-25 June 2001

Ibrahim Alio Koble	84	Asano Alio Sheito	70
Haji Hassan Alio	79	Adan Mohamed	69
Abdi Mala Abdille	76	Musei Aletuse Mohamed	60
Hassan Ibrahim Ahmed	74	Ahmed Mohamed Yarow	44

Muralle Communities

Bambo Center, Mandera

22 June 2001

Maalim Bare	70	Sheik Abdaheman Maailim Musaal	N/A
Muktar Mohamed	60	Mohamed Baresakar ©	N/A
Buul Ali Abdille	59		

Lafey Center, Mandera District

1-2 July 2001

Mukiar Muhumud Omar	80	Mohamud Sheikh Nurow	50
Sheikh Ahmed Haji Abdi	80	Ali Mohumud Ali	45
Ahmed Ali Dakane	70	Faráh Absow Adan (Asst. ©)	45
Jelle Ahmed	61	Sheikh Adow	42
Mohumed Yussuf Bulle	60	Adan Ali Ibrahim	40
Bash Maow Osman	56	Maalim Ali Shabelow	40
Adan Birik Muhumud	50	Mohamed Sheikh Isack	30

Fino Center, Mandera District

2 July 2001

Abdi Ali Abikar	75	Mohamed Ali Hussein	58
Billow Sheikh Banow	73	Maalim Mohamed Adan Ibrahim	52
Maalim Mohamed Mohamed	70	Abdikadir Ibrahim Absiye	51
Abdi Ali Elmi	67	Omar Maow Abdille	48
Adan Mohamed Abdi	65	Sheikh Abdi Abdille	41
Mohamed Yarrow Matan	62	Aidan Shillow Abdi	40
Adan Ali Mohamed	61	Mohamud Ibrahim Adan ©	37
Abey Ahmed Adow	60	Adan Abdi Osman	30

Ogaden Communities

Dujis Center, Garissa District

13 July 2001

Abdi Ali Elmi	87	Abdullahi Yahye Hassan	40
Amin Abdullahi Sheikh	87	Abdi Jelle Hassan	38
Abdi Affey Abdi	84	Abullahi Oman Ali	38
Hassan Rage Gar	50	Mohamed Aedi Adow	37
Suyak Ali Issak	55	Gedi Dahir Omar	30

Korakor Center, Garissa District

13 July 2001

Abdullahi Sanweine Elmi	70	Abdi Mathose Farah	66
Derow Haji Yussuf	70	Bonttul Adan Ahmed	64
Dubow Abdi Maow	69	Adan Hassan Muhumed	62
Ali Salat Hassan	68	Hassan Ali Yussif	55
Ibrahim Ali Barre	68		

Riverine Community

Salim Abalaga

Hanisi Abalaga

Laheley Center, Wajir

9 July 2001

Hassan Ismail Adan	76	Dugow Abdi	56
Sharif Ahmed Sharif Dubow	72	Abdi Hirsi	47
Sheikh Shuab	65	Mohamed Abey	40
Imam M. Mukfar	60	Sharif Mohamed	40
Salat Mohamed	58	Mohamed Omar	39

Masalani Center, Ijara

12 July 2001

Imam Maalim Ibrahim	85	Abdi Guhat Burale	63
Mohamed Muhamed Adan	83	Kalib Abdullahi Afkuro	47
Elmi Abdi Yussuf	78	Muhumed Sahal Ahmed	40
Hussein Maalim Farah	72		

Nandighi Center, Garissa District

12 July 2001

Ore Adan Jili	85	Mohamed Abdi Yarrow	46
Ibrahim Abdi Abdulle	61	Abdillahi Kuno	45
Adow Bille Ahmed	60	Ismail Ali Gure	45
Adan Shimburi Hussein	53	Yussuf Abdi Abdille	43
Ali B. Abdi	53	Mohamid Sherif	41
