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Theoretical and Practical Frameworks of Analysis of Pastoral
Common Property Regimes in Somalia

Mohamed Said Samantar

A b s t r a c t

The purpose of this paper is to consider an alternative assumption which involves cooperation in individual pastoral behaviour. This approach offers completely different policy implications than the usual Defection Dominant Strategy models, which advocates privatisation of the commons or state control of these resources. This alternative theoretic-game is known as the Assurance Problem. We give a brief presentation of the salient features of this model. This analysis is covered by section II of the paper.

Secondly, the paper presents an overview of pastoral common properties in Somalia (Nuqaal region) as an empirical example of successful efforts to manage such resources. The technical and physical characteristics of Nuqaal, a typical dryland area in Somalia, as well as the difficulties and options open to the pastoralists and their livestock are presented. This part is presented and discussed in sections III and IV of the paper.

Thirdly, the paper offers a useful practical framework of analysis of the pastoral customary common property regimes in Somalia. This framework of analysis is based on the strategies of the above Assurance Problem model. The paper contends that the Assurance Problem's strategies of interdependence, coordination, cooperation, and expectations, found among the pastoralists in Somalia, are necessary to cope with the difficulties of their environment. This analytical framework is presented and discussed in section V of the paper.

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I Introduction

The purpose of this research is to:

- (1) proposes the use of an alternative assumption which involves cooperation in individual pastoral behaviour which offers completely different policy implications than the usual Defection Dominant Strategy models; the latter model advocates privatisation of the commons or state control of these resources.
- (2) give an overview of pastoral common properties in Somalia (Nugaal region) as an empirical example of successful efforts to manage such resources;
- (3) give a useful practical framework of analysis of pastoral customary common property regimes in Somalia.

Accordingly, the paper covers five sections:

Section I introduces the main objectives and sets the scene for the sections of the paper.

Section II of the paper aims to identify a theoretical framework of analysis whose basic assumptions fit the reality of the Somali customary property regimes: In Somali pastoral reality, it seemed appropriate to use an alternative theoretic-game with respect to the conventional paradigm, where individuals do not have any dominant strategy: the Assurance Problem game. We give a specific but brief presentation of the salient features of this model. This model supports an alternative policy implications with respect to the Defection Dominant Strategy models.

Section III of the paper presents an empirical example of successful customary efforts to manage resources in Somalia and explains the conditions for this success. This constitutes an empirical evidence as an alternative to the main-stream models of pastoral common property regimes.

It also illustrates the validity of the assumptions of the Assurance Problem model in the case of Somali customary pastoral management. This section covers the technical and physical characteristics of Nugaal, a typical dryland area in Somalia, as well as the difficulties and options open to the pastoralists and their livestock.

Section IV establishes the existing relationships of individuals in pastoral groups, following the Assurance Problem model's conditions of coping strategies with situations of uncertainty. These strategies are specifically presented as: (i) interdependence, (ii) coordination, (iii) cooperation, and (iv) expectation.

Section V sets the framework of analysis for the Somali pastoral common property regimes. This framework is based on the strategies of interdependence, coordination, cooperation, and expectations, found among the pastoralists in Somalia, necessary to cope with the difficulties of their environment.

II Theoretical Framework

In the literature on common property regimes there are two interpretations of what causes negative externalities. Sen (1967) was the first to notice this fact in the general economic literature. In fact, Sen (1967) asserts that the relationship between private and social discount rates is actually a special instance of a very general problem, being an extension of the two-person non-zero-sum game known as the Prisoners' Dilemma game. He describes first the general nature of this problem and then shows that there is another problem, close to this one (with which it is sometimes confused) but which has a very different logical structure and involves different policy implications. This is the Assurance Problem game, and it constitutes a new contribution in game-theoretic application in pastoral analysis. The difference can easily be noticed from the following brief descriptions: Prisoners' Dilemma is a simple game in which collective decisions produce outcomes detrimental to the group as a whole without intervention by some superior authority.

The Assurance Problem is a game, where the lack of a common property institution is the major cause of resources degradation. Therefore, the function of the institutions of the pastoralists is to assure expectations of collective behaviour, and so lead a sufficient number of pastoralists to adopt a cooperative strategy.

We focus our attention on alternative models of behaviour which involve cooperation and which predict different results to the mainstream models of common property regimes.

This model leads to a very interesting policy implication, which is that only the pastoralists as a group can solve their own problems. They have successfully done it in the past. They themselves have established rules and regulations to which each individual pastoralist in a specific group must adhere.

Therefore, our major concern is to foster a development process which gives high priority and recognition to the existence of pastoral institutions.

Let us now begin the discussion by recalling the main features of the Assurance Problem game, as summarized by Runge:

First, coordinated strategies can evolve inside the structure of the game ... Second, the model places central emphasis on the interdependence associated with group decision making, and the multiple outcomes possible when agents are engaged in a search for rules of coordination when there are no dominant strategies ... Third, it emphasizes the key obstacle of

uncertainty, emphasizing the fact that opportunity costs must be paid to develop the support for new rules or norms of coordination. (1986:45-46).

These features of the Assurance Problem game (which place the problem of common property regimes as one of lack of interdependent strategies among pastoralists) is a good framework for pastoral common-pool resources management in the Somali context.

The basic reason is that once an agreement is reached no pastoralist will have an incentive to deviate from the agreement because there is no payoff which will put him in a better situation than he is in already.

The important point raised in the Assurance Problem game, is that: the incentive to cheat exists before the full carrying capacity of the common-pool resource is reached. But, the motivation to cheat is dropped after this limit is reached. This is a reasonable argument for stability.

However, Stevenson contends that stability through assurance can occur without dropping the incentive to cheat in a real-world common property solution:

There is no reason, however, to jump to totally new frameworks to model the benefits of assurance, as Runge does. The Problem of assurance can be modelled within the original context of the prisoners' dilemma by allowing adjustment of individual strategies once the other player's move is known. This, after all, is similar to the real world in resource extraction. (1991:74)

The case of Somalia more strongly resembles the conditions specified by the Assurance Problem game than it does with models of repeated Prisoners' Dilemma.

However, where all models based on the repeated prisoners' dilemma seem to contradict with the Assurance Problem game is the key assumption: the nonseparability of choices (Runge 1981).

This assumption leads to a stable cooperative solution of common property regime which can not coexist with non-property regime. Rather cooperative solutions of a non-property situation or open-access is given through enforcement from an outside authority. But we have already mentioned that the temptation to cheat is stronger especially when all others cooperate in Prisoners' dilemma models. Therefore the final solution of these models is either in the form of privatisation or in the form of state control.

Let us explain the features of the Assurance Problem game against the features of the notion of defection as the dominant strategy, such as the Tragedy of the commons, as the basis of solving externalities as shown in Table 1:

Table 1 Assumptions and Solutions of an Externality		
<u>in Common Property Models</u>		
Model	Prisoners' Dilemma	Assurance Game
1) Assumption	Separable	Nonseparable
2) Equilibrium	Enforcement	Assurance
3) Final Solution:		
Property Regime	Private/State	Common

Source: After Runge (1981), Stevenson (1991) and Our Elaborations

Table 1 shows that the final solution of negative externalities, say over-grazing, lies in institutional arrangements. The difference is that in the Prisoners' Dilemma models the cause of externality is given by a non-property situation where individuals have independent strategies because individual choices are separable. The solution (privatisation or State control) in this case is expected from outside the group of pastoralists. In the Assurance Problem model individuals do not have separable choices but any decision regarding the common-pool resource is to be taken in relation to all other pastoralists. Therefore, the solution (customary common property regime) is endogenously set since the pastoralists can correlate their strategies and in doing so they are in a position to further their individual and group interests at the same time.

Moreover, the above rigid separable assumptions of the Prisoners' Dilemma can be overcome, without making recourse to outside interventions, if pastoralists play the game repeatedly. Consequently, the pastoralists can correlate their strategies for a better individual and social solution. However, the repeated Prisoners' Dilemma game is subject to equally very rigid assumptions: full information on the part of the pastoralists of their overall strategies and an infinite number of plays by the pastoralists. Both assumptions have been strongly attacked by a number of researchers¹. The most serious criticism is elucidated in Hector (1990).

Aside from these convincing criticisms the Iterative Prisoners' dilemma does not take into account the importance of culture and the logic of property rights is non-existent as does the Assurance Problem Model.

In fact, the Assurance Problem Model involves environmentally friendly customary management of the

¹ For example, the assumption of infinite repetition is criticised by Rasmusen when he writes: "Even in infinitely repeated game, cooperation is not immediate, and not every strategy that punishes finking is perfect" (1989:91).

pastoralists in the setting of their strategies² as well as taking into consideration new contracts when accommodating changes that have taken place in their own environment (Runge 1981) in the expectations of individual and social optimal future benefits. This entails a self-evident way of playing the game leading pastoralists towards cooperative solutions (Nash-Cournot equilibria).

In fact, in the Assurance Problem Model these Nash-Cournot equilibria do not represent situations of conflict but rather situations of cooperation (see Samantar 1994).

Furthermore, the Assurance Problem Model accommodates, in general in general terms, the new directions for pastoral development for it attributes great importance to the analysis of situations of uncertainty (see the most acclaimed recent publication in range management edited by Scoones 1995).

Apart from these general theoretical considerations, it is our intention to provide some empirical evidence of the conditions for success in managing the pastoral common property regimes. These conditions are the ones which give to the pastoral community the assurance that cooperating will allow them to reap all the benefits of cooperation.

The basic idea was to arrive at a set of conditions of success by looking, first, at the main features of the Assurance Problem model (see also White and Runge 1994) in relation to those of the other cooperative models used in common property regimes' analysis.

The conditions for success are determined by considering to whether: (i) individual strategies can be interrelated, (ii) coordination can be accomplished within the group, (iii) individual as well as social benefits can be maximized by abiding by the rules; (iv) future action by any pastoralist can be foreseen by any other because of the trust element in the binding commitments. This can be summarised in Table 2:

Table 2 Features of the Assurance Problem Game
(1) Interdependence for nonseparable social choice;
(2) Coordination from inside the group;
(3) Cooperation for optimal individual and social outcomes;
(4) Expectation for future moves from members is certain.

Source: After Runge (1986) and Our Elaborations

These conditions will be referred as to whether individual strategies hold the following features: (i) Interdependence, (ii) Coordination, (iii) Cooperation, and (iv) Expectation.

² See the interpretation of the Assurance Problem model in Lundberg & Pollak in that culture is an important element in the player's choice of strategy (1994). *as well as in Swift (1995).*

III Customary Common Property Regimes

We have briefly shown in section II that common property regimes are a solution of the Assurance Problem theoretic-game.

In sections III and IV we explain how the above features of the Assurance Problem game can be accommodated in the Somali pastoral context of common-pool resources management.

III.1 Definitions

Let us now introduce the concept of customary property rights.

The term customary covers all rules and practices which have been acquired locally, as opposed to arrangements imposed from outside. These customary rules include those which regulate the common resources. On the contrary, according to the perceptions of the Somali pastoral society, state resources are seen as public goods. In fact, these goods are conceived by pastoralists as open access, or subjected to no property regime.

In our discussions we are interested in the notion of customary common property regimes and more specifically pastoral customary common property regimes, since customary rights include non-pastoral rights.

To avoid confusion, we will simply use the terminology common property regimes in place of pastoral customary common property regimes, since most of the literature covers this notion. In many instances common property regimes cover non-customary rights, as confirmed by Bromley and Cernea (1989).

As defined by Bromley (1989:871), the above common property regime will include the pastoral customary common property regime since it includes:

- | | |
|---|-------------------------------|
| i) "a well-defined group of authorised users" | <u>Diya-paying group</u> |
| ii) "a well-defined resource that the group will manage and use" | <u>water and pasture</u> |
| iii) "a set of institutional arrangements" | <u>council of male elders</u> |
| "that define each of the above, as well as the rules of use for the resource in question" | <u>Xeer.</u> |

In what follows we will elaborate in sufficient detail all the three items one by one. We begin by explaining first item ii) water and pasture, the major pastoral common-pool resources. This is followed by item i) diya-paying groups. Finally, item iii) council of elders and xeer, is tackled.

III.2 Common-Pool Resources

This subsection presents the pastoral common-pool resources in Somalia. The major valuable common-pool resources - resources that are vital for the livestock and individuals' survival in Somalia - consist mainly of pasture (vegetations either browsed or grazed by livestock), water (ground water mainly, though rainwater is preferred) and salt-licks (apart from the salty vegetations grown in some areas, salt-licks are also found under mineral formations, especially in the Nugaal ecological zone).

These resources are sparsely distributed among different ecological zones. Rain water, the most appreciated resource by the pastoralists in Somalia, since pasture and some of the surface water depend on the extent of the annual rainfall, is scanty, seasonal, and varies greatly from year to year and from place to place. This fact alone indicates that drought constitutes a recurrent crisis that pastoralists have to struggle with throughout their lives. In other words, to cope with this harsh environment, pastoralists have developed mobile and flexible strategies. To take advantage of these widely scattered and diverse pastures (in the form of grasses, bushes, and trees), the household divides the herds of camels (mainly browsers), cattle and sheep (exclusively grazers), and goats (browsers and grazers) into several management units.

Given the existing level of technology it seems that this is the best way of exploiting those resources under the different ecological niches. More elucidation on this aspect is found in Swift (1977) and Lewis (1961).

It is important that we explain these technical and physical attributes of the study area before we start a close examination of the pastoralists' main management strategies, as well as the rules and processes which actually govern access to pastoral common-pool resources.

The extent to which the different common property regimes' management techniques are utilised depends in large part on the degree to which rights and duties are recognised and exercised by the pastoralists.

As we have explained in section II, ownership of these natural resources is crucial to the very existence of the pastoralists and we are dealing with different perspective from the mainstream views as presented by the defection-dominant strategy paradigm.

III.2.1 Geographical Area and Population

The study area is the Nugaal administrative region of Somalia, which measures approximately 40,000 square km (more than 6% of the total Somali territory), is the southern part of what was, before the beginning of 1970s, the old Migiurtinia administrative region (see Samantar 1994).

The predominant group in the study area is Ciise Maxamuud of Majeerteen who share, along these border lines, pastoral

resources mainly with Cusmaan Maxamuud and Cali Saleebaan, both of Majeerteen, in the north, Cumar Maxamuud of Majeerteen in the south, Dhulbahante, who share with Majeerteen a common ancestor by the name of Harti of Darood in the west, see Map 1.

In normal circumstances, every household has a customarily specific area of pasture for every season known as degaan (settlement area of a lineage group), and partly because every household prefers to preserve its autonomy. A degaan can be as small as one household settlement, or large enough to cover the settlements of the whole lineage group of Ciise Maxamuud. These are easily identified by the name of the settlement given by the pastoralists through specific geographic characteristics such as the names of prevalent trees, water points, or soil types. The name of the degaan is part of the identity of the pastoralist because through this he can easily trace his lineage group to the level of his closest ancestor.

III.2.2 Climate and Ecological Zones

The study area has four main seasons:

- i) Gu' is the big rainy season (March, April, May);
- ii) Xagaa comes with strong winds and very high temperatures (June, July, August);
- iii) Dayr is the small rainy and hot season (September, October, November);
- iv) Jilaal is the dry and moderate temperatures season, except in some coastal areas which experience showers³ (December, January and February);

The temperature data was available only for Eyl and it is not even a recent one. In fact, temperature data were available from the Italian records before 1940 as reported by Hemming, (see also Hunt, 1951:87):

the average mean monthly maximum ... was 36⁰C for May, while the average mean monthly minimum for December and January was 21.1⁰C, with a average diurnal range of 10⁰C. (1973:4).

The annual rainfall is very scarce and unreliable. Another important factor is that there is a great variation of rainfall from year to year. It is difficult to calculate statistically significant figures over a considerable number of years to show this. There is also a great variation of rainfall incidence between inland and coastal areas, where the

³ On the contrary, coastal showers take place in the Southern part of the country during Xagaa season.

latter enjoy a better occurrence of rainfall than the former. But even coastal areas seem to receive less mean rainfall than before, as noted by Hemming:

There is a strong field evidence that there is a general reduction in rainfall eastward along the Somali Peninsula. (1973:4).

The four seasons can be grouped into two main periods: the rainy season or Aaran (Gu' and Dayr), and the dry season, or Jilaal (Diraac and Xaqaa).

The ecological zones of the region can be distinguished into four main areas.

These four ecological zones are based on interviews with the elders of the region and the direct observations following visits paid to these areas (see Samantar 1994).

In Hawd and Cadduun there are some pockets where the rain-water rivers flood and pasture is relatively plentiful.

III.2.3 Pasture

The main types of vegetation found in the different ecological zones are shown below:

Meel baadku yaal oo biyuhuna dhex jiifaan isla baadiqoobayoo biciidku islawaa.

This is translated into English as:

I searched for a place where there exists plenty of pasture with plenty of water in it, but even the oryx could not find it.

Not all species are brought to the same area of pasture but they are spread on different areas. In fact, the pastoralists practice Xabawar or the separation of sheep from camels and goats for grazing and browsing purposes during the dry seasons. The first rains occur in the Hawd area, and camels prefer it because of better browsing; it is also the area where major losses of camels take place. That is one of the reasons why a greater labour force is needed in Hawd than in Nugaal and Iyax. Life in Hawd is difficult but rewarding in terms of abundance of pasture.

The other difficulty facing the pastoralists in the Hawd area is that burden camels can only carry a limited supply of water; only male camels are used for transport, because they are either slaughtered for household consumption purposes or swapped in the market with other non-pastoral goods. Therefore, pastoralists with a small number male camels are compelled to move frequently.

Uqbaad are the favoured pasture-areas in hawd, because of the presence of highly palatable adapted species of vegetations for the concerned herd. Scouts are sent for exploration immediately after the first rainfalls. Every family knows exactly their own Uqbaad areas within his degaan

(settlement area), where pasture can last long. This is sometime utilised with urgency for, fear of outsiders coming to pasture in this particular degaan, especially when lack of rainfall has been sparse. To avoid this they practice Diqaxiir, which means that the best Uqbaad areas are occupied so that the new-comers are left with the worst pasture areas where, at best, they can remain for only a few weeks. Because of this technique it is very rare that pastoralists come with enthusiasm to somebody else's degaan.

After the rainy season all livestock, especially camels, feel the physiological need to consume, after every two months, salty vegetation or salt-licks. Therefore the need to move back to Nugaal is caused not only by the search for water but also by the desire to change the taste of the vegetation.

The customary practice of range control was to use the Hawd, the waterless ecological zone, during the rainy seasons and the Nugaal (the ecological zone which, though mainly salty, contains plenty of water) during the dry seasons. Besides, Nugaal and Iyax allow easier management practices because of the presence of shorter plants than in Hawd and Cadduun.

This seasonal migration of livestock is motivated by the variability of the rainfall and the necessity of following the rains. Such a system can thus be very efficient in that it makes optimal use of resources that are highly variable, both temporally and spatially.

As told by elders in this region in old days their pastoral ancestors were anxious about their future, expressed in the saying:

Marka shillinta Hawdka iyo tan Nugaal isqabato xaqgee la degidoonaa?

This is translated into English as:

Where will we live when will come the day the two tick infestation zones of Hawd and Nugaal will unite?

III.2.4 Water

Most of the available water-points exist either as ground water or as rainfall reservoirs. The most important water points during Jilaal can be distinguished as bugo (permanent shallow-wells or home-wells⁴), Biyo Yarood (temporary shallow wells), barkad or baraag (artificial rain water reservoir) and ceel-motoor (deep-wells). We will discuss deep wells and barkads.

⁴ Home-well is the definition given in Hunt (1951) for common property wells.

III.2.4.1 Buqo

In Nugaal and Cadduun there is no problem in extracting water from the well: its maximum depth is only 3 metres.

Pastoralists prefer to use their home-wells (buqo). These are hand-dug shallow wells owned as common property by specific diya-paying groups, but accessible by other diya-paying groups through an instituted contract, xeer (see next section). A buqo water source comes from the underground reservoir and they are generally located in Nugaal even though they are salty (except the ones in the Togs or intermittent river beds). In Hawd they are exclusively found along the togs. The most utilized Togs are Dixiyo, Laas-Cannod, God-Quraanleh, Dhanaane and Dheganle. There are at least 34 wells in Dixiyo and 22 wells in Dheganle (these are shown on map 2 without the names because they are too many to be written down). The first buqo, Mataan, was dug out in Dheganle more than 300 years ago. Overall, there are now 56 wells, but it may be possible to dig out many others. During the time of my visit only a few had a permanent water supply. These wells are used mainly during the dry seasons. Every time it rains, Buqo along the Togs are completely filled with sand, compelling the poor pastoralists to face the difficult task of hand-digging them out again.

Having elucidated the pastoral common-pool resources, we now explain in the following section the second component of the customary common property regimes in Somalia.

III.3 Diya-Paying Group (DPG)

A diya-paying group is a group of people who effectively unite to collectively safeguard all matters of common interest. These matters of common interest depend on the relationship among members of the group which defines their rights in relation to: (i) one another, (ii) as well as the resource base. This coincides the definition given in Lewis:

Members united in payment of blood-wealth. (1961:5);

and as:

A corporate group of a few lineages reckoning descent from 4 to 8 generations to the common founder and having a membership of from a few hundred to a few thousand men. (1961:6).

This group is literally a reer or bah (see below) united for the purpose of blood-wealth management. In fact, diya is an Arabic term, meaning blood-compensation for death. Its two corresponding words in Somali is maq and qaan, which are equally used. Diya is preferably paid and received in camels.

Such units should also have a distinctive symbol which characterises their identity. This is branded on camels or

water points to protect their exclusive ownership by a group of people.

The concept of diya-paying group is associated to the concept of reer or bah.

The notion of reer (reero pl.) has different connotations depending on the circumstances in which it is used. A household is sometimes known as reer, which consists of, at least, one man (normally the household head), his wife/wives and his children (a nucleus family). This unit of reer is also referred as goys.

This is the concept of reer as a production unit, which normally consists of different management units according to the requirements of livestock species owned. When reer is prefixed to an ancestor's name it then indicates all his descendants. This conception of reer is the generally used form among the pastoralists, and from now on we shall refer to it as the equivalent of a lineage group. Nevertheless, one can still raise the question whether there exists a limit as to which level of ancestorship is referred to when we think of a specific unit. There is no such definition. These are only a matter of convenience to the lineage group which varies with the changes of circumstances.

There are few cases in the study area where in place of reer, bah is prefixed to the name of an ancestor from the mother's lineage group (where she herself attaches to male ancestors). In fact, since in polygyny brothers of different mothers are distinguished by the name of the ancestor of their mothers, bah stand for a group of people who share a common ancestor (as in the case of reer), but who are also of the same mother. In other words, bah are groups of people who share both a uterine relationship and a common ancestor along the male line of descent. Bah can be said to imply the existence of at least two brothers of different mothers. Bah take the name of lineage group of the mother.

We are interested in the reer (as a lineage group) united, not only for political reasons, but mainly due to the need to organise collective management of valuable resources. A reer is identified by the name of its members' common ancestor, which sometimes is not even prefixed by reer or bah, but just the pure name of the ancestor. At what level of a lineage system this ancestor should be located is purely subjective matter.

In conclusion, a diya-paying group is the typical reer or bah commonly used by the pastoralists as a political, social, and management group.

III.4 Council of Male Elders and Xeer

It is important to bear in mind that a diya-paying group is defined according to its effectiveness in terms of cooperation as part of a risk-avoidance strategy. This means that the bounds of a diya-paying group in terms of lineage segmentation levels can best be described according to the specific circumstance in which pastoralists are found in a particular period of time. These political decisions are set

by the council of male elders (Guddiga Odayaasha) in their customary gatherings (better known as shir). In principle, the basic council of male elders is composed of all male members in a diya-paying group though in practice, the decision-taking process is left to male elders⁵ as a sign of respect. This is where all collective decision take place. Whatever is agreed in the shir is passed as a resolution and it becomes the source of the customary law⁶ or the xeer of the diya-paying group. In other words, these elders in council are representatives of the smallest political unit, or the diya-paying group, and their deliberations constitutes a piece of their customary law, known as xeer. The members of these groups themselves are bound to the xeer.

In general, xeers are contracts which can be formulated at levels of the lineage systems equivalent to or higher than the diya-paying group. The set of all these contracts or xeers form the body of the customary law, which covers all aspects of the pastoral society. we are concerned here only with those xeers which regulate the use of common property regimes⁷.

Cerulli (1951:16) gives an idea of the strong power invested in the xeer where he explains the high cost paid by all those who do not abide by the xeer in terms of social dishonour and humiliation.

It is important to understand that the kind of coercion, that Cerulli has mentioned above, is not an authority imposed from outside the group, rather it is a manifestation which has evolved from inside the group.

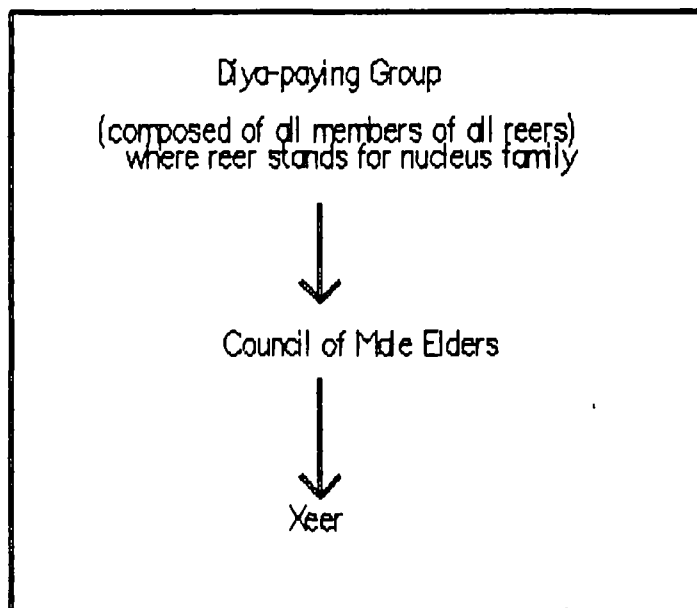
The above structure is given by the following figure 1:

5 Male youngsters and women are exempted of paying diya. Diya is only collected from every male household head in a diya-paying group.

6 For the different legal interpretation of customary law and its relations with Xeer and Caado see Guadagni (1980:27-33).

7 A list of xeers regulating water as Common Property Regimes in southern Somalia is given in Lewis (1968).

Figure 1 Relationship between Diya-paying Group, Council of Male Elders, and Xeer



Source: Field Interviews

III.5 Common Property Regimes, a necessity

In this section we have seen that the pastoralists are operating in a high-risk environment. Their lives are full of uncertainty and their livelihoods are threatened by the conditions of the persistent drought. Crisis is the norm, not the exception. We have also seen the option available to them to cope with these difficulties: livestock herding-management, which is the best way of exploiting such an environment with the given level of technology. As a consequence of this high-risk activity in a high-risk environment we have seen that common property regimes are not a matter of choice, but rather are dictated by necessity.

The pastoralists in Somalia have developed a balance with the ecology of the region. Their overall numbers of livestock will be determined and controlled by the frequency and extent of drought (which is an inevitable control factor). The pastoralists have taken the maximum advantage of the resources by recognising the constraints imposed by their environment, and by selecting those, animal and vegetation, species that are conducive to drought resistance avoidance strategy.

In fact, especially in the waterless Hawd and Iyax ecological zones, a pastoralist should dig either his own well to fetch water from or (alternatively) a relative has to provide him. To avoid the disastrous fate of isolation, elders echo from time to time the Somali aphorism:

Ceelna uma godna cidina uma magna.

This translates into English as:

He has no water⁸ available and no one to fetch for him.

This proverb introduces the desperate need of cooperative strategies among the pastoralists in Somalia.

We have seen that an individual pastoralist identifies himself through genealogy. Through genealogy pastoralists interrelate their strategies and establish a convenient group - diya-paying group - to cope with the difficult environment. All elders in a diya-paying group gather in a shir under a tree and take, democratically, on an individual consensus basis, important decision of common interest to them all.

These decisions form the bulk of rules and regulations, known as xeer, which include the rule of management of common-pool resources which define common property rights and duties among members of the group.

Therefore, given these commitments and the relative sanctions enshrined in their xeer, the pastoralists in Somalia prefer to inter-relate their strategies in the use of the common-pool resources.

⁸ The literal translation of the Somali word "Ceel" into English should have been "well". In this context "well" means "water". Water has to be transported over a burden camel from where it is available. Definitely water is to be transported from the Nugaal ecological zone.

Moreover, the basic two elements of scarcity and uncertainty of rain water force the pastoralists to establish strong and solid social ties to ensure that more cooperation than defection strategies are adopted. The 'best expression of this strong relationship between ecology, livestock, and socio-politics of the pastoralists is found in Lewis:

The difficulties of the harsh environment have been met by the separation of the grazing camels from the sheep and goats with the formation of two separate herding units making for the maximum utilization of the resources available. This division which conforms to ecological requirements is also accompanied by a distinction in the value which attach to the types of stock. Sheep and goats have importance mainly in subsistence uses while camels have greater social value since in addition to their subsistence uses they are regarded primarily as a medium for regulation of most aspects of social, political, and religious life. In a sense camels represent agnation, for to a large extent social relations are function of joint interest and joint rights in them. (1961:88).

Because of the high variability of resources availability, every pastoralist finds that he has to access common-pool resources managed by another group sometime during his survival. In most cases, outsiders have to first ask permission, which is normally granted when there are good relations with them.

In principal, according to the rules that regulate pasture and water, in times of scarcity entry rules are open to neighbouring groups, first, if they happen to come on someone's degaan.

We now turn our attention to the establishment of appropriate conditions which tend to induce cooperative strategies among the pastoralists in Somalia.

IV Strategies of Somali Pastoral CPRs

In the last section we discussed the issues relating to the management of valuable resources in a high-risk environment and how the pastoralists have survived, and probably will continue to survive for the next centuries under these stressful conditions. In this analysis we set forth the context which shapes the behaviour of the pastoralists in Somalia. We shall now discuss the behaviour of the pastoralists in the struggle to adopt cooperative strategies to manage common property regimes.

As we saw in the last section, the success of the management system of pastoralists in adapting to their difficult physical environment is partly due to the many different management strategies that pastoralists pursue even when new kinds of risks present themselves.

It is also intended to illustrate the validity of the assumptions that underlie the Assurance Problem model as a framework for the management of Somali pastoral customary common property regimes.

Therefore, in this subsection as well as the next subsections, our aim is to analyse the strategy relations found in customary management of common property regimes. To do this we will make use of the framework of the Assurance Problem game in section II and accordingly analyse four main features of the pastoralists' strategy relations displayed in Table 2. These features are presented as (i) interdependence, (ii) coordination, (iii) cooperation, and (iv) expectation. The first feature is the subject matter of this subsection and will explain the reason behind interdependent action among the pastoralists in Somalia.

IV.1 Interdependent Strategy Relations

In this subsection we will lay out the basic conditions of interdependence in the pastoralists' strategies. The pastoralist's strategy of interdependence is deeply rooted in the Somali lineage system. It is important to understand the mechanics of the lineage system of Somalis because this, associated with property relations, gives rise to a range of rights and duties attached to the resources in question.

Since Somalia gained independence, clans have been officially abolished. In addition to this, a 1975 law (no. 73) established the state's right to own all land. Neither the idea of abolishing clanship nor the land tenure law have ever found application in the pastoral community for reasons which we will explain in due course. The fact is that for the pastoral people clanship is part and parcel of their daily life, for through it they express their mutual cooperative expectations⁹.

⁹ Recently some African writers, such as Mwamula-Lupandi (1992), have shown deep interest in Clan Theory as a basis for development studies in rural Africa.

In fact, every Somali pastoralist can identify himself only by tracing his relationship to the founding father of his genealogical tree (abtirsiinyo).

Clanship is important for individuals to know how they are related to each other because the kind and the degree of relationship is associated with rights and duties. The basic political unit is organized conveniently by the male elders in council. The second step is to send delegates from the basic political unit to councils of horizontally and vertically larger relationships. Therefore, decisions taken at the basic political unit are more prone to be associated with strong rights and duties among its members. The wider the relationships, the weaker the rights and duties upheld by the individuals involved.

IV.2 Coordination

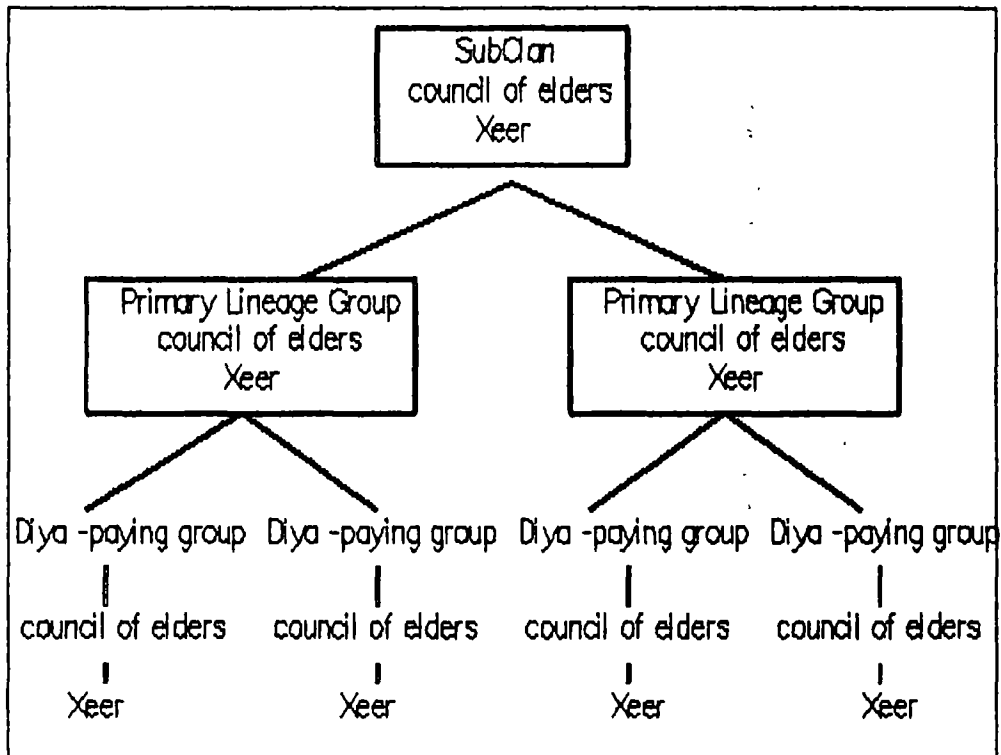
This section describes who coordinates the management of the common-pool resources and how. It attempts to explain that if there exists an interdependence of strategies among the pastoralists according to the Xeer, as mentioned in the previous section, in the study area then coordination of strategies can evolve from inside the diya-paying group.

The important element in this aspect is to distinguish whether coordination of the strategies of the pastoralists comes from inside the group or is imposed from outside the group.

We argue that coordination of strategies of the pastoralists evolves from inside the group. This is possible because group decisions are taken by the pastoralists on the basis of previous agreements (recorded in the minds of the elders as their xeer or contracts) that they themselves have established in the council of male elders, or on the basis of new rules and regulations authenticated by the council of male elders.

We can depict in a generic framework the different levels of contracting xeers by the council of male elders at the different levels of genealogy as shown in Figure 2:

Figure 2 Different Levels of Contract Arrangements



Source: Field Interviews

Figure 2 shows that there are different levels of councils of male elders whose main task is to set up and enforce the rules of coordination of the strategies of the pastoralists in relation to their respective degaans. At the bottom of this structure is placed the council of male elders who regulate and coordinate common-pool resources in their respective degaans at the diya-paying group. At the top of the structure is placed the council of male elders at the subclan level. In the middle is found the council of male elders at the primary lineage groups. These different councils have different tasks to accomplish in relation to the respective levels of the degaans they control. Similarly, xeers formulated by different groups at different levels have different concerns. Consequently, councils of elders placed at higher level are not considered as superior institutions to the ones relatively placed at lower levels in the structure shown in Figure 2.

Therefore, coordinating the strategies of the pastoralists does not need superior institutions to monitor whether the rules are adhered to or not.

Moreover, these rules are set on the basis on the experience of elders who are very knowledgeable of their physical environment. Therefore, these management rules and regulations, or xeer, are self-enforcing since they are instituted within the council of elders of the diya-paying groups who are charged with managing the common property regimes. Besides, in these councils every male member, no matter how old, has the right to attend in person or to be represented by a relative. Once the management agreement is reached it becomes the law as deliberated by the council of elders or their xeer. We know that xeers are enshrined in the social fabric of pastoralists as a whole, where the descent system and rules and obligations arranged through these councils of elders provide a stable self-enforcement system.

The credibility of rights is of paramount importance for the system to operate in a smooth manner. This does not mean that conflicts do not occur at all; they do take place especially when water and pasture are scarce and coordination is weak. In fact, whenever conflicts arise the elders intervene promptly to settle any disagreement.

In most cases once an agreement is set by the council of elders only few of them are selected to carry out decisions on their behalf.

In the election of these elders with especial responsibility, apart from being the elder son of a hereditary head-man of a diya-paying group, one of the following three attributes is required for a candidate:-

- i) good knowledge of Islamic culture (xaraf ku taliye);
- ii) good knowledge of Somali literature with plenty of wisdom (xikmad ku taliye);
- iii) good number of livestock (xoola ku taliye).

In other words any title is acquired by birth, by merit, or by wealth. In any case the council of elders has to fully discuss the matter and look for a general consensus from members. Elections are celebrated by pouring camel milk on to the body of the newly elected chief. These are the people

whose main purpose is to take care of the common interest of their group (including common property) as well as establishing relations of good neighbourhood with other groups through agreements made in council meeting which as we said earlier becomes xeer. These elected elders or duqo become the coordinating bodies, which is very informal by nature, who monitor that rules are enforced.

Once the rules of use of range are set by the above council of elders, pastoralists know what action is to be taken to coordinate their strategies. These are based on their common property right and duties in relation to the genealogy relationship. Therefore, coordination of strategies take place between households at different lineage segmentation levels.

Moreover, effective coordination of common-pool resources is at the level of diya-paying groups rather than at higher and larger lineage segmentation levels (primary lineage group, subclan, clan and clan-family). The main reason is that the more distant is your genealogy relations with another pastoralists the weaker is the probability of successful strategy coordination.

IV.3 Cooperation

This section illustrates the diverse cooperative strategies employed by the pastoralists in Somalia to cope with risk and uncertainties.

This section illustrates, cases of cooperation among the pastoralists in Somalia regarding common property regimes as well as the elaboration of cooperative individual strategies which may indirectly help establish long-run self-enforcing behaviour in the smooth management of the shared resources. It is important to analyse this aspect of strategy relations among the pastoralists because it emphasises the point that among different attainable strategy relations they will opt for those which translate into cooperative actions. Therefore, they will select strategies conducive to situations of cooperation without conflict.

These cooperative strategies have been developed by the pastoralists as a necessity against risks and uncertainties of the kind exposed in section III. All these strategies are enshrined within the xeer, instituted and enforced by themselves through the councils of male elders of a diya-paying group.

IV.3.1 Water

As we have seen in the previous section on coordination, the fact that a number of households take decisions at the diya-paying group level to have exclusive use-rights to a water point does not mean that others can not come in for watering on somebody else's degaan. To facilitate this, pastoralists have established cooperative relations at

different levels of lineage relations, vertically or horizontally. These arrangements are done through their xeer.

There are a lot of historical events told by the elders to the young generation in order to make sure that they will abide by the xeers.

IV.3.1.1 Miilo

The management of water from home-wells in cases of high concentration of livestock is known as miilo.

Miilo consists of a set of arrangements necessary for a fair distribution of water, where every pastoralist involves himself by cooperating in the process of fetching water or assists in the separation of the animals for queuing purposes. If pastoralists do not respect this (i.e., they fail to wait for their turn), they are thereafter forbidden to water their animals from that well. Most of the wells fall within the degaan (settlement area) of a number of households. Therefore, the degaan committees of male elders undertakes the management role. In cases where there is no precedent the elders hold a meeting and the outcome is conveyed to the Isla'an, who will announce the verdict with his blessing. If the wadaans (a device made of camel leather used specifically for fetching water from the wells) are more than 20¹⁰ there is a strong reason to start the process of miilo as the best water distribution system known by the pastoralists. The wadaans, if they are more than 20, are divided into two (if less than 40) or three sets. Each set (maximum 20 wadaans) is given its turn of watering in a queue.

The elders, while sitting under a tree and enjoy playing shax (a chess-like game), keep an eye on the situation just in case someone breaks the rule. This is very unlikely to happen, however, because of the fact that all young male pastoralists (maximum 20 at a time depending on the diameter of the well) fetch water simultaneously from the well regardless of the ownership of the livestock to be watered. In fact, the arrangement of miilo divides wadaans and livestock into different sets, but it does not divide the pastoralists.

For pastoralists that happen to be in an area of another diya-paying group for watering, the xeer is that the pastoralists of the second degaan (settlement area) are committed to serve them first as a sign of good neighbourliness.

10 Elders in the study area are convinced that if the number of wadaans are less than 20 the process of fetching water from the well is not that cumbersome to raise the need of Miilo. Note that the number of wadaans is identified with the number of livestock. Animals are watered collectively without regard on who owns them.

IV.3.2 Pasture

The first rule in pasture land, as observed by any pastoralist, is to never fix your camp too near to another one.

Especially in the Hawd ecological zone, because of the relatively thick vegetation which is an excellent environment for livestock to be hunted by wild predators and livestock raiders, there is a minimum distance of 0.5 km between encampments of even very close relatives. In the other ecological zones there is no need to be so close to each other because of their relatively plain nature and the relatively sparser vegetation. Moreover, the above minimum distance serves to prevent the degradation of the environment, and ensures that cries for help can be heard.

In normal circumstances, pasture is managed according to the level of the diya-paying group. Here, individual pastoralists seem to be independent from one another since everyone is known in this area of pasture, though in reality they are organized at the level of the diya-paying group to ensure that each household gets pasture from his degaan. If necessary this assurance can be sought at a higher lineage segmentations level.

This system does not imply that other pastoralists can not come to pasture in this degaan. Hospitality, in terms of pasture utilisation by guests from other clans, does of course occur in cases of lack or shortage of rainfall in areas occupied by these other clans. This kind of mutual cooperation is also stipulated in the xeer agreed by the two neighbouring clans.

IV.3.3 Livestock

Even though livestock are owned by individuals, they are seen, especially camels, as part of the general claims of a diya-paying group.

A good justification for this is that camels are drought-resistant animals, and therefore, highly appreciated by all pastoralists. They constitute a precious target of camel raiders. Therefore, they are always watched over as a very valuable resource by all members of a diya-paying group.

This is best described by Lewis:

Over his camels a man has primary, but not absolute, rights of possession. For the camels of the individual members of a "diya-paying group" constitute their joint stock-wealth as a group. (1961:83).

In fact, according to the perception of the pastoralists, any of the owners' relatives will see the camel as his own property also, and will fight to the death in her defence in case of threat to raid.

This situation of insecurity forces that a number of

cooperative strategies are pursued by the pastoralists. Some of the most important include the following:

- i) gaadiid celis is the contribution of burden camels given to relatives or friends when the movement of pastoralists takes place and one of the families does not have enough burden camels for transport. The receiving family is expected to do the same in the future.
- ii) kaalo is the contribution of livestock given at marriage to the groom by his close relatives or his friends.
- iii) dhibaad (bridal gift or dowry) is the contribution of livestock or livestock products given at (and sometimes after) marriage by the bride's family to the groom; yarad is the marriage gift given by the groom or his kin to the bride's family.
- iv) xoolagoyn is a contribution of livestock given to both sexes of family members during serious scarcities of food.
- v) maal is the process by which a Household is lent a she-camel for milking.
- vi) xoola-celin, the most important rule of cooperation among the pastoralists, requires each pastoralist to keep with him any lost animals from another pastoralist, regardless of his clan membership. He is committed to look for the owner, by passing the word to other herders passing by, and to hand the animals over to him.
- vii) another binding commitment, in principal, is that every member of a diya-paying group is always ready to fight to regain another member's camels when they have been raided. In practice this can only take place if the council of elders fails to mediate the case.

These types of cooperation in livestock constitute an integral part of the pastoralists' xeer.

IV.3.4 Labour

The very fact that the livestock of a household is split into different groups and brought into the various ecological zones according to age and species implies an availability of labour. But, the reality is that in Somalia most households do not possess this abundance of labour.

To solve this problem the strategy adopted by the households is to cooperate in herding the various groups of livestock. This is more demanding in the Hawd than in other ecological zones because of the presence of relatively thick vegetation, especially trees.

Separation of animals into different management units

during animal watering also requires a good supply of labour.

In order to assist other pastoralists on this matter, scouts, apart from playing the role of investigating water availability, attempt to determine whether other herds are being watered, in which case they will join in the task of keeping the animals far away from watering points until their turn is arranged with the other herdsman. The reason is that they know that it will require a lot of effort to keep the animals away from the water point.

As an economic effect of establishing the payment in camels and the procedures of the diya, a first principle of the xeer is ensuring that labour is not taken away from the household since each one's activity complements the other. As a Somali maxim asserts:

Mindi Saawira iyo madax muuqda midna laqama samro.

Which translates into English as:

One should never give up either of the following two: a worn out knife and a hopeless person.

The idea is that one might one day need help, and since a knife can always be sharpened there is also the chance that the hopeless man can assist in one way or another in the course of his life.

In a similar vein, Drysdale, notes:

Every able-bodied man and woman is needed, especially in hard times, to keep the livestock in good condition. The absence of one person for a long period can throw the livelihood of a family into jeopardy. (1964:18).

IV.4 Expectations

This subsection presents the confidence that the pastoralists enjoy in their expectations and trust of a self-perpetuating system. The last feature in our analysis of the strategy relations in this section focuses attention on future expectations among the pastoralists in Somalia. We have dealt with the basic elements which give the conditions necessary for the pastoralists to inter-relate their strategies in common property regimes to reap the maximum benefits. Pastoralists do not take into consideration only present benefits but attach a lot of importance to the future ones. This is because of the insecurity of the environment in which they operate. In other words, the objective function of a pastoralist is to maximise the present benefits and to ensure people's long-term survival. A good example of how present actions have repercussions on the future is that during a serious drought, a pastoralist is bound to slaughter a newly born camel in order to secure the she-camel's milk. His basic action is to use her milk to help his family survive the drought.

Regarding common property regimes, as mentioned earlier,

in this region the combination of sufficient pastures and few wells in the Hawd and the Iyax, and poor pasture and permanent water in the Nuqaal and the Cadduun, conditions the cycle of nomadic movement. The management of this arduous lifestyle relies upon the capacity of the pastoralist to exploit these resources very efficiently through mobility and through the selection of animal species which can best match this difficult environment such as the drought-resistant ones: camels. These conditions make the future choices of the pastoralists about the use of the resources in question nonseparable. Therefore, they have to establish rules, xeer, which guarantees that their expected strategies are met sometime in the future. These situations often occur since no pastoralist is assured that in the next rainy season he will have water for his animals in his own degaan.

All this explains the individual pastoralist's expectations with respect to insecurities brought about by the environment in which he must operate. Let us not forget that the individual pastoralist does not operate in isolation; he is better able to insulate himself from the hazards of the environment if he relates his expectations with those of others.

Members of a diya-paying group's assurance regarding the expected strategies of other members of the same diya-paying group is given by their specific internal rules and regulation of customary common property regime (xeer). This internal xeer is enforced by the duqo (elders), through the authority invested in them by council of male elders of the diya-paying group.

The expectations are enshrined in the reliance that each member of a diya-paying group has placed in the xeer. The basic reason is that behind the formulation of the xeer is the necessity dictated by recurrent events, such as droughts, which bear elements of risks and uncertainties. In other words, these situations of crisis make common property institutions a necessity. The principal advantage of pastoral customary common property regime is its ability to embody the rights of all members and to protect them equally against all sorts of environmental risk and uncertainty. The expectation for each member is that, thanks to the xeer, when he is in need of help, he can be confident that he will get it from others in return for at least a similar commitment on his part. In other words, because of environmental uncertainties, which can put at risk the survival and security of the pastoralists, at any time and in any place, they have elaborated mutually beneficial cooperative rules of management of pastoral common pasture and water.

Therefore, the principle of trust in the xeer gives to the pastoralists the assurance of their expectation.

V Towards a Framework of Somali Pastoral CPRs

V.1 Summary of the Previous Sections

In pasture as well as in water, it is the diya-paying group that determines rules of deciding common property management and the rules of controlling them.

Moreover, considering the fact that pastoralism is a land-extensive enterprise which requires quick response to highly variable rainfall patterns, we have come to the conclusion that:

- i) scarcity and uncertainty of resources (rainfall) continue to make pastoral customary common property regime management (common use-right, not an exclusive use-right) a necessity.
- ii) alternatively, a pastoral customary common property regime, in turn, conserves important scarce resources than under a system of imposed control from above which leads to free riding situation among the pastoralists¹¹.

The Assurance Problem game suggests the same solution. In fact, we indicated that the solution to a nonseparable externality lies in the common property regimes institution. But the common property regime, as Bromley explained, is one consisting of:

- (i) a well-defined group of authorised users... (ii) a well-defined resource that the group will manage and use ... (iii) a set of institutional arrangements that define each of the above, as well as the rules of use for the resource in question. (1989:871).

In the case of Somalia:

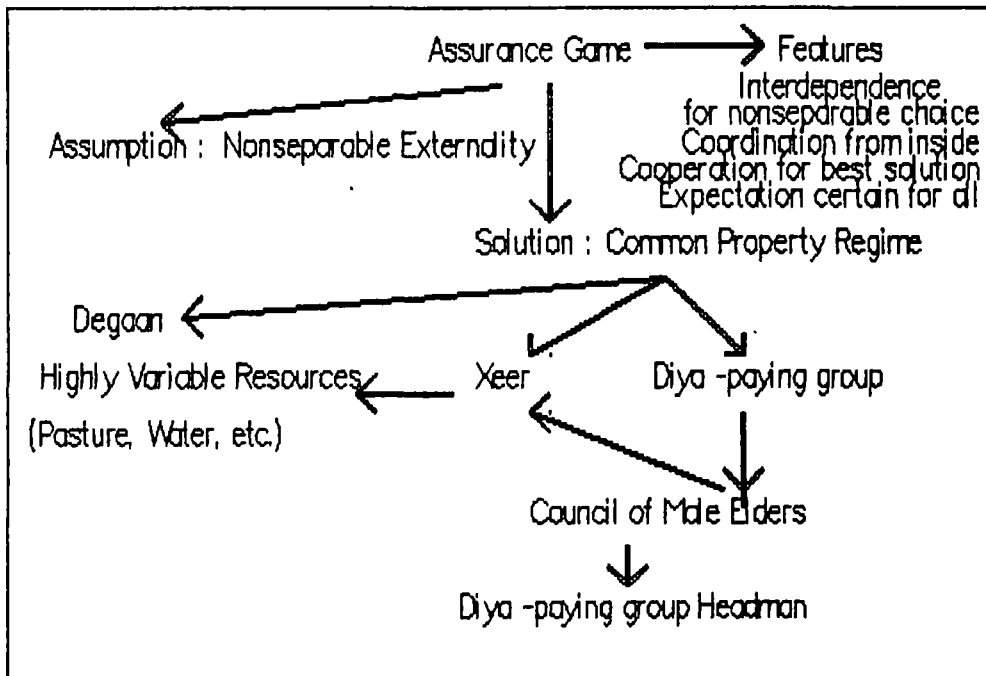
- (i) is a diya-paying group, (ii) is the common pasture and water, and (iii) is the council of male elders and the rules are the xeer for the utilization of the common pasture and water.

We have also explained that xeer is defined by the council of male elders in a diya-paying group. Each diya-paying group has an elected headman (dug).

The above flow of relationships is summarized in the following figure 3:

¹¹ Shepherd would say that: "Where a country is as poor as Somalia, key natural resources will be far more cheaply and thoroughly protected by common property resource management than by paid government officials - as the villagers themselves argue." (1989:61).

Figure 3 The Relationship between the Assurance Problem and Common Property Regime in Somalia



Source: Ater Runge (1986) and Our Elaboration

The above figure shows pastoral customary common property regimes in Somalia as a particular solution to the generic model of the Assurance Problem. Such a relationship between the Assurance Problem model and the structure of the pastoral customary common property regimes in Somalia is reflected in the institution of xeer which is the outcome of contracts stipulated by the pastoralists themselves. Furthermore, this contract or agreement can hardly fail because it is reached with the consensus of all members of the council of male elders of a diya-paying group. In fact, the rules and regulations to manage common property, xeer, have simply evolved from inside the group. Therefore, it is in the interest of all members that these rules are equally observed and safeguarded from eventual transgressors.

V.2 Practical Framework

Let us now turn our attention to the basic elements to a guideline of a practical framework for the Somali pastoral customary common property analysis.

We have been striving so far to delineate the importance of matching (see section IV and subsection III.5) the environmental uncertainties (see section III.1) with the pastoralists' behavioural uncertainty (see the rest of section III except III.5).

To do this we present the main features of the practical framework based upon our theoretical framework described in section II:

i) Common-Pool Resources

Degaan defines a settlement area of lineage groups. Pastoral common-pool resources are found in a degaan such as pasture, water, salt-licks. These resources should be identified as well as the locations of the livestock species during the different seasons of the year. The variability of these resources should also be examined since it determines the kind of strategies needed to exploit such resources.

ii) Interdependence

The genealogy of the diya-paying groups using the common-pool resources during the different seasons of the year. The existence of homogeneous group such as agnatic lineage groups should be analysed. The importance of this relationship gives an idea of its association with the existing individual and group property rights of specific pastoral resources.

iii) Cooperation

The different cooperative strategies adopted by the pastoralists to make the best use of the available common-pool resources should be analysed. This analysis should be done in relation to the existing labour resources in order to maximise the benefits derived from these activities. Specifically, the following strategies should be studied:

- a) herd mobility : spending more time in winter or in summer grazing areas? and why?
- b) herd dispersion : which species and age group graze in which ecological zone and in which season of the year? and why?
- c) labour dispersion : which sex and which age group does a)? or b)? and why?

In general, should be examined the existence of a high-risk and well-defined customary grazing area for the purpose of joint-use and joint-control of the pastoral valuable resources.

Iv) Coordination

Proper inquiry of the council of elders' mechanism of decision-making such as collective punishment and collective reward (compensation) would serve to understand the effectiveness of coordination strategies to manage pastoral common-pool resources. Detailed description of the particular xeers should be written down.

The effectiveness of the application of these xeers should also be scrutinised.

v) Expectation

To deal with this type of strategy, the mechanism of conflict resolutions should be studied to explain the strength of the existing xeer (well-defined rules and regulations of management of the common-pool resources established by the council of male elders of a diya-paying group).

VI Conclusion

The mainstream or the conventional literature on common property regimes relies on what we have called the Defection Dominant Strategy Paradigm (Samantar 1994). This literature has generally used the term common with such imprecision that it has confused, rather than clarified, the meaning of the term. This confusion has been compounded by the equation of the term common with such terms as communal, open-access, traditional or background. These equations tend to reinforce the existing bias concerning the relative merits of either individual or systems common and to confuse objective assessments.

Alternatively, other theoretical institutional arrangements were investigated to avoid the above confusion. We come to the conclusion that the theoretical institutional arrangement of common property regimes should be analysed as an Assurance Problem, which, as noted by Larson and Bromley:

involves coordinating the expectations of strategies among the players of the game. The assurance problem is a non-cooperative game¹² where the players do not have a dominant strategy to defect from all agreements. (1990:240).

It is also worth considering the fact that, pastoralists, in managing the customary pastoral common-pool resources, have developed cooperative strategies which enabled them to sustain their livelihoods through centuries.

These cooperative strategies have evolved inside the pastoral groups to cope with the risks and constraints imposed by the pastoral environment. These cooperative strategies are not confined only to short-term risks. They take into consideration the long term uncertainties as well, such as periodic droughts. In other words, the pastoralists have developed cooperative strategies which allows them to reap the maximum benefits from their environment. These strategies will also help them to ensure that externalities (over-consumption, therefore, conflicts) will not take place.

As we said earlier, the success of these cooperative strategies in managing common-pool resources is due to the ability of the pastoralists to develop a coherent set of flexible rules, xeers. In addition, they organised themselves into diya-paying groups which suited the management of common-pool resources.

Each member of a diya-paying group will have specific interests in the management of the concerned resource, and those interests will find expression in claims made by the

¹² This expression should have read cooperative game. Alternatively, if we accept that the assurance game is a non-cooperative game then we should not have to mention agreements. In fact, the contradiction of the expression "non-cooperative game" appears in the final part of the sentence, "players defect from all agreements". See also footnote 2.

members of the diya-paying group in relation to genealogical affinity.

To the extent that nonmembers of a diya-paying group do not interfere with members' management and access rights, nonmembers also have access to the resources. Even these are clearly established by the xeers existing between two different diya-paying groups, each one pertaining to different lineage groups.

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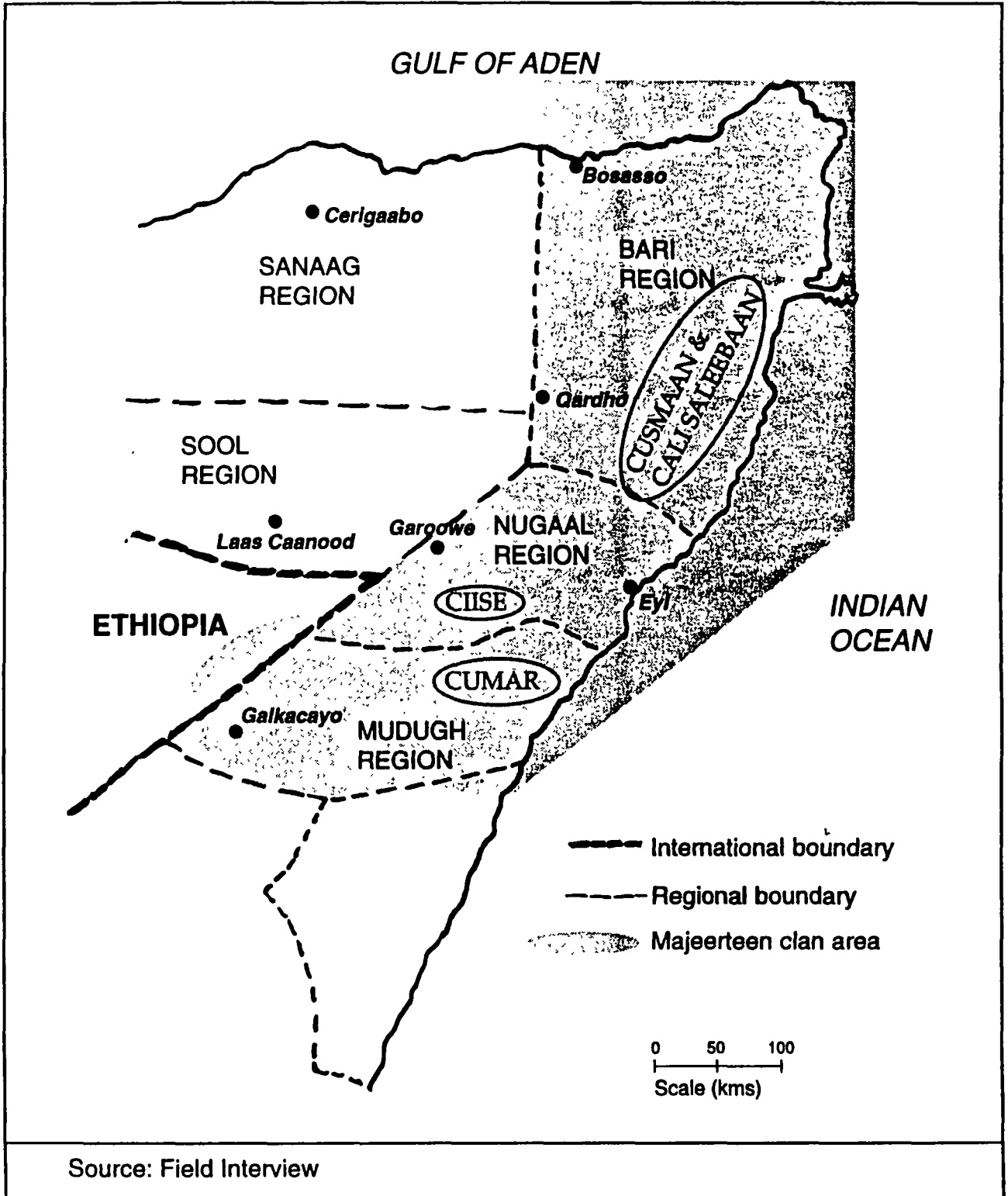
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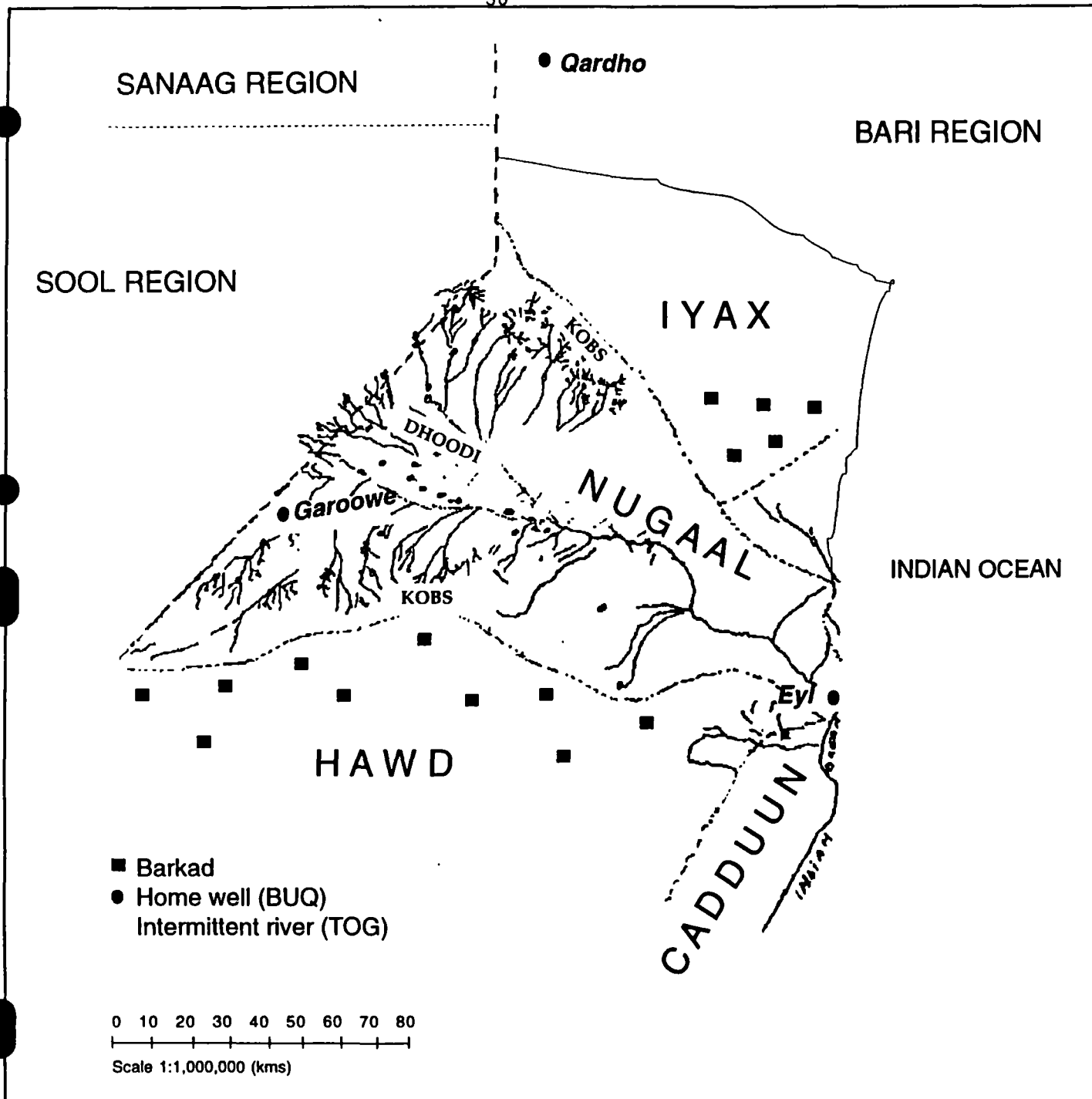
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Map 1 Clans and Subclans in and around the Study area





Source: Hunt (1951), Field Interview