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THE IMPACT OF DEVELOPMENT  
ON TRADITIONAL PASTORALISM  
IN  
SOMALIA

by

Abdulkadir A. Handulle

A report submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Range Science

Plan B

UTAH STATE UNIVERSITY  
Logan, Utah  
1987

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### ABSTRACT

The Somali pastoral nomads live in an environmental condition of risk and uncertainty. The scarce and unreliable rainfall is the primary element which determines the existence of nomadic pastoralism. The lands devoted to pastoralism in Somalia are those arid and semi-arid areas that could not sustain cropping, so that pastoralism may be considered the only rational utilization of the land resource.

Nomads live in an environment where the survival of both animals and plants are constrained by many factors such as droughts. Yet, both nomads and their animals have evolved by learning numerous adaptive strategies to cope with their harsh, unpredictable environment.

Mobility is the primary means by which Somali pastoralists compensate for the sparse and unpredictable resources which characterize the arid environment. It is a strategy of risk aversion, crisis survival, and a way of exploiting a rangeland poorly endowed with moisture.

The use of different species of livestock common to arid environments by nomadic pastoralist is based on pragmatic considerations. The practice has both ecological and economic implications. Different species utilize different ecological niches more efficiently than single species. Resistance to drought also differs, as does reproductive rate and maturation rate. Therefore, by keeping a mixture of small and large stock, Somali pastoralists

are able to exploit an environment which could not be as productive otherwise, and each specie provides a valuable resource. Camels, for example, are kept mainly for milk and transportation, sheep and goats as a source of meat, and cash income.

Various rangeland development projects and programs were undertaken as part of an effort to improve the range resource and to alleviate constraints in livestock production. Four successive range development projects have been implemented. These include the present on-going Central Rangeland Development Project in addition to three other projects in the northern part of the country. Lack of baseline data and inadequate numbers of qualified people were the principal problems encountered. The formation of an agency responsible for all range activities in the country was one of the major achievements.

Various interventions have resulted in unanticipated long-term environmental degradation and have had a detrimental impact on the fragile pastoral ecosystem. The development of stock water points as well as veterinary services have caused more harm than help.

Above all, Nomadic pastoralism makes use of an environment which is difficult to manipulate in light of present technology and social institution. It is recommended that any development program plan should consider basic factors contributing to the nomadic land use. Also, research is needed to mitigate the impact of dynamic environment. The underlying problems are mainly due to increasing human population and refusal of policy makers to understand the complexity of pastoral ecosystems.



## INTRODUCTION

Pastoralism is a form of livestock production in which subsistence herding is the primary economic activity and which relies on the movement of herds and people (Dyson Hudson 1980, Sandford 1983). It is based on extensive livestock grazing mainly in arid and semiarid areas where mean annual rainfall varies between 100-500 mm. In these areas, scarcity and variability of rainfall are the dominant features (Meigs 1953). Nomadic pastoralists which exploit these areas by livestock production employ various survival strategies to cope with environmental conditions of risk and uncertainty.

Livestock production is the principal economic activity in Somalia, accounting for approximately 50% of Gross Domestic Product (GDP) and more than 80% of export revenues (SDR 1982). About 55% of the Somali population is engaged in nomadic pastoralism, while 80% of the population is engaged in livestock raising of one sort or another.

The current basis of livestock production from rangelands is an extensive and mobile system of grazing adapted to the environmental characteristics of the country. Native rangelands cover about 80% of the land area. Because much of the rangeland is unsuitable for any other use, it is expected that traditional pastoralism will continue as the only viable and rational form of range resource exploitation.

Recent changes, however, especially the development of permanent watering points and improved animal disease control, have modified the pastoral ecosystem and have removed some of the social, economic

and environmental controls which played a crucial role in sustaining pastoralism as a viable way of life. As a result, the traditional practice of pastoralism has become economically and ecologically unstable. The major famine of 1974-75 and widespread environmental degradation were a clear indication of the breakdown of the traditional system of production and the increasing vulnerability of the pastoralists.

Neither colonial rule nor government economic development projects and programs which involved both donor and government agencies have improved the economy of pastoralists in Somalia. Actually, those interventions that were initiated have been deleterious to the pastoral peoples and their livestock.

The objective of this report is: (1) to identify the principal ecological and socio-economic factors which contribute to the sustainment of nomadic pastoralism as a way of life, (2) to discuss and analyze how traditional Somali pastoralists attempt to buffer themselves from the vagaries of a harsh, unpredictable environment, and (3) to identify and discuss the impacts of development projects and programs on the ecosystem and the nomadic way of life. Some alternative approaches to development and resource utilization are suggested.

## CHAPTER TWO

### THE SOMALI PASTORAL ECOSYSTEM

The Somali Democratic Republic is located between latitudes 11°30'N and 1°30'S in the extreme northeastern corner of the Horn of Africa (Figure 1). It is bordered by Ethiopia, Kenya and Republic of Djibouti on the west, southwest and northeast, respectively (Cahill 1980). The area of the country is 638,000 square km<sup>2</sup> of which 28.8 million ha are suitable for livestock raising.

#### a) Climate

Somalia is entirely situated within the arid and semi-arid zones according to Meigs' (1953) definition and has total annual rainfall varying from a maximum of 600 mm in the south to less than 100 mm in the northern coastal plains (Figure 2). Also, according to Pratt's and Gwynnes' (1977) ecological classification, the entire country falls within IV, V, and VI ecological zones. Abdi (1981) divided the country into three main climatic zones: 1) a northwest zone with a Mediterranean climate and an annual precipitation of above 400 mm in certain areas, 2) a northern and central zone with an arid and hot climate and annual precipitation between 50 and 200 mm, and 3) a southern zone with a more humid climate and annual precipitation of up to 600 mm.

Precipitation is distributed in most of the country in a bimodal pattern with two alternate wet and dry seasons which occur during the year. The main rainy season (Gu') from April to June is dependent on

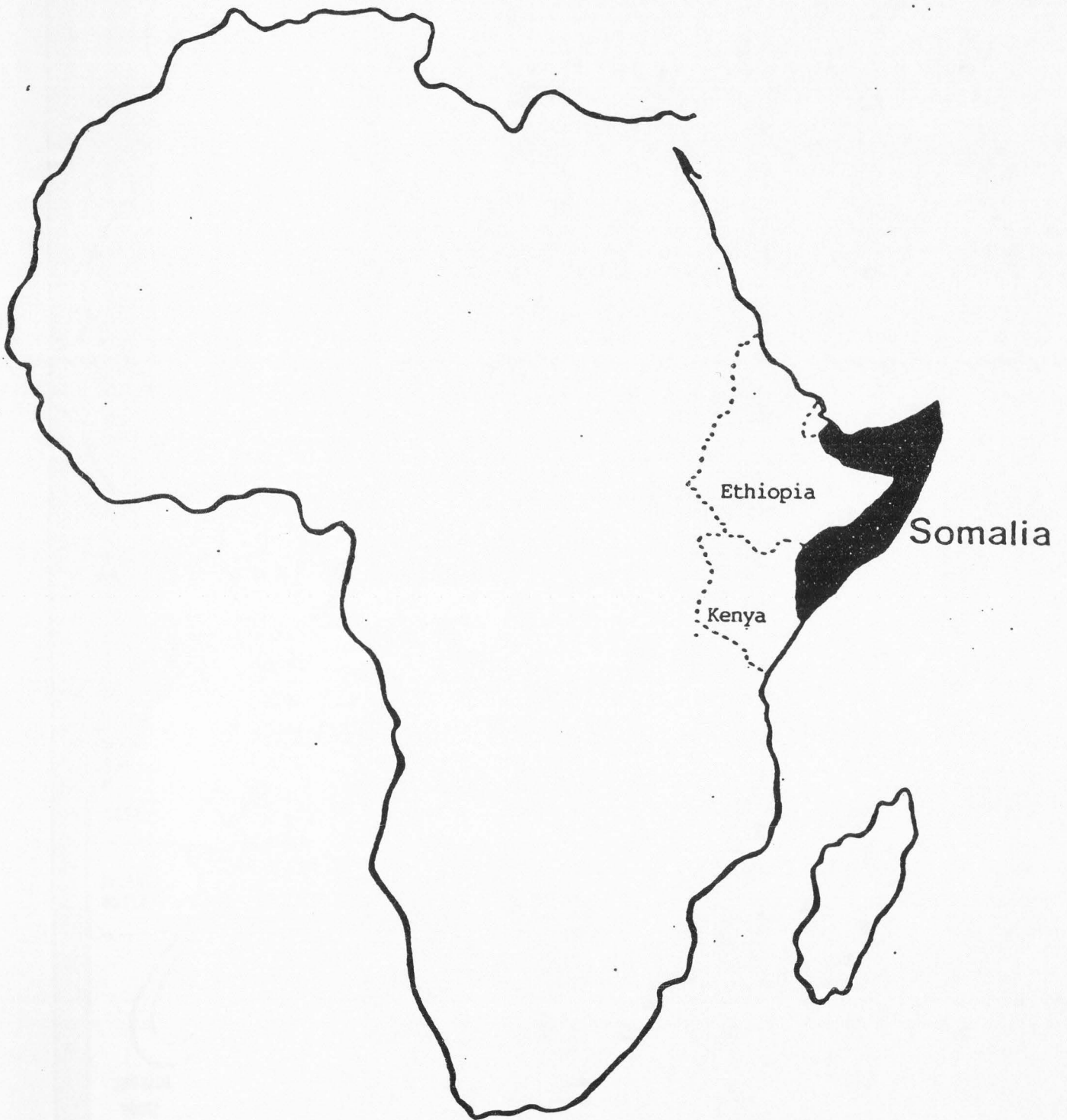


Figure 1. The African continent showing the location of Somalia.

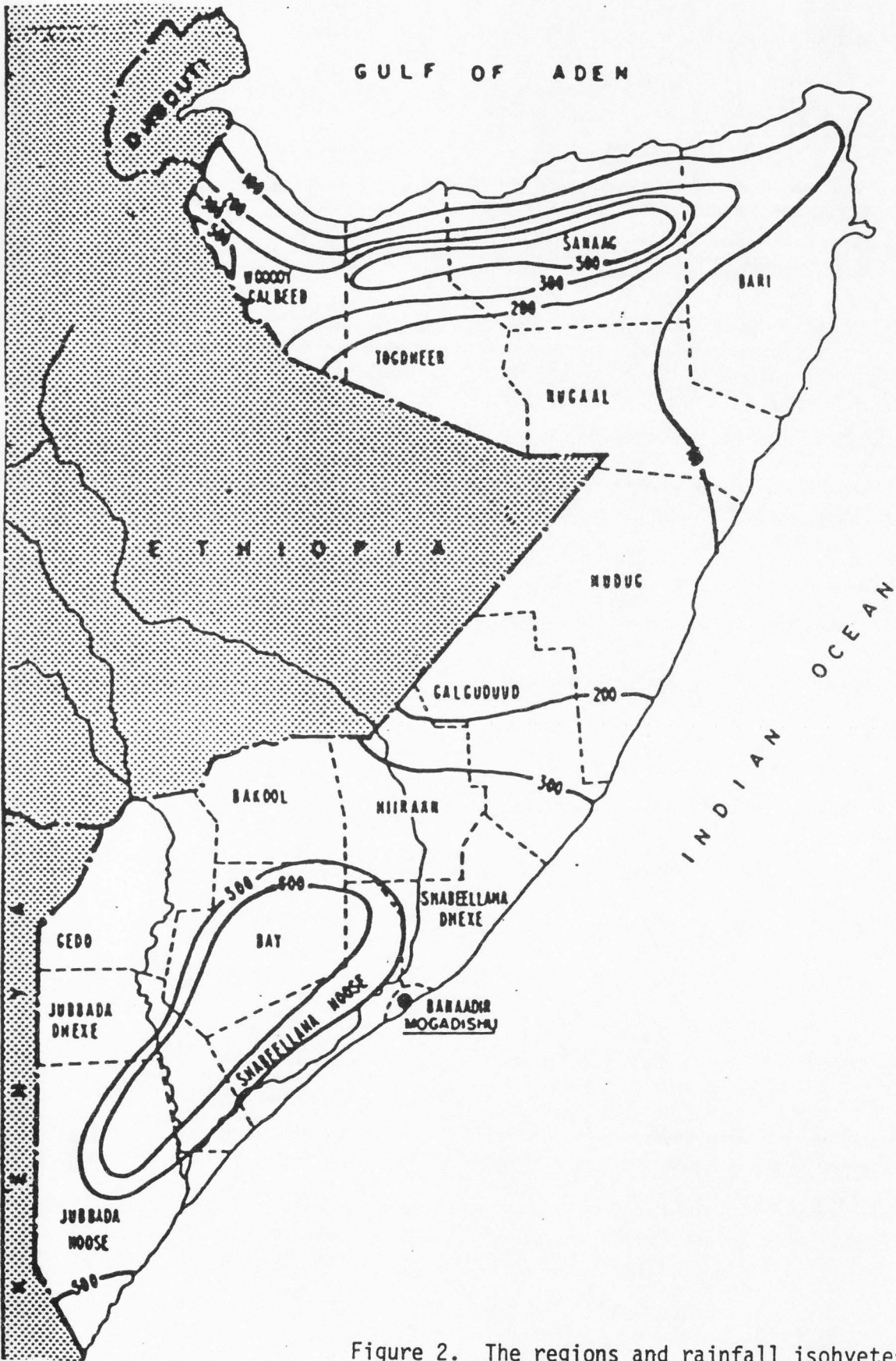


Figure 2. The regions and rainfall isohyets mm/year. Adapted from Somalia Area Handbook, 1981.

the southwest monsoon, while the short rainy season (Deyr) from September to November depends on the northwest monsoon. The summer dry period (Xagaa) is of variable length and some rain falls in the southern coastal areas, while the winter dry period (Jillaal) rarely has any rain at all. The major climatic element determining the distribution of both flora and fauna is rainfall.

Major characteristics of the rainfall pattern in the Somali environment include scarcity (varying from a maximum of about 600 mm per year in the south to about 50 mm in the north), poor distribution (weather stations in Hargeisa a few miles apart reported rains differing by 30-40 percent), variability in the beginning date of the wet seasons (the beginning of the main rainy season vary by about one month), and high variability from year to year resulting in droughts of different degrees of severity every 4 or 5 years (Abdi, 1981). Such scanty, erratic, and unpredictable moisture limits the productivity of the rangelands. Although the country is arid and rainfall is sporadic, the Somali pastoralists have sustained themselves by developing a system of seasonal nomadic rotation dictated by the harsh environment (Box 1968).

These environmental uncertainties impose limits and constraints on plant productivity and livestock development (SDR 1977). Pratt and Gwynne (1977) observed that as the moisture deficit increases, plant communities change from wooded grassland to more open grassland to desert-grassland with dwarf shrubs. Perennial grasses are typical where rainfall is over 250 mm and annual grasses dominate in drier areas.

b) Characteristics of Somali nomads

Brown (1971) defined nomadic pastoral groups as those who either from necessity or choice, depend wholly or almost wholly on the products of their livestock, such as milk, meat, blood and hides, and who seldom or never eat grain or sugar. This generalization is misleading. For instance, Somali pastoralists cannot, or do not choose to, live by their herds alone. They eat millet, sorghum, and rice, and need clothes, tea, sugar, and other goods they do not produce themselves. They sell animals and animal products in order to buy these items.

Ayan (1981) took a comprehensive approach to the definition of pastoral nomad as people who are traditionally livestock herders as opposed to crop cultivators, and depend upon livestock for subsistence either through direct consumption or trade, and who as a result of their harsh environment, are in continuous movement, grazing their livestock on communally or state owned land.

In response to their ecological resources, the Somali pastoralists, which are characterized by relatively low productivity and by fluctuating and unpredictable forage resources, have two grazing units: the nomadic hamlet (Guri) consisting of nuclear families that are related to one another. Women and their children are the main stable social units living in these hamlets. Goats, sheep, and a few milch camels are kept to provide the family with milk, purified butter (ghee) and meat. Camel camps consist of adult men and boys who migrate long distances with grazing camels seeking better pasture conditions (Lewis 1965).

Apart from different definitions of pastoral nomads, Somali nomads share with other pastoralists of Africa and elsewhere certain key characteristics. First, Somali pastoralists keep camels, cattle, sheep and goats. Each species apparently have particular biological and productive attributes which determine how they are managed and their economic and social importance to families. Also, Somali pastoralists share with other pastoralists a love for the animals they herd. This close relationship between pastoralists and their animals is summarized by Box (1968) as follows: "Pastoralists have an appreciation for livestock developed through the centuries of close association with animals." Both the livestock and the pastoralists are a part of the range ecosystem.

Secondly, seasonal migratory movements are employed by Somali pastoralists to search for better forage and water (Box 1968, Lewis 1961). It is sometimes assumed that Somali pastoralists follow the rains and the nomadic herd movements are as erratic as the rainfall pattern in any particular year (Behnke 1985). Similar observation was found by Watson (1983) who found no evidence to support any regularity in timing or location of migratory movement. The cycle of the year is rotation of the four seasons, and the annual system of movement conforms to seasonal rhythms of climate and vegetation (Abdi 1981, Lewis 1965). Thus the pastoral cycle of movement is primarily dictated by the occurrence and distribution of water and forage resources. However, availability of forage and water are not the only causes of movement. Other subsidiary factors affecting movement are the infestation of ticks and biting flies, the availability of



salt and forages for stock, and a number of social factors, such as family reunions.

Thirdly, the nomadic pastoralists of Somalia live on marginal lands and indeed represent a true pastoral society. Coppock *et al.* (1985) and Dyson Hudson (1984) described pastoral nomadism of East Africa as a livelihood which exploits a harsh and unpredictable ecosystem using traditional practices of livestock raising, continually responding to a wide variety of environmental perturbation. Because of the arid and semiarid nature of the environment, Somali nomads are faced with severe environmental constraints. For example, there is no assurance that rain will fall consistently on a given spot during the two rainy seasons. Also, serious cyclical droughts are experienced periodically. Drought conditions are complicated further by overstocking and overgrazing of the best rangeland areas. Thus, there is a lack of appreciation by many development planners about the highly developed adjustment to the environment which the pastoralists have made to arrive at a system which offers them the minimum risk in a very marginal physical environment and intimate knowledge of the physical resources (Baker 1975).

Lastly, a communal system of land tenure that is primarily based on the belief that rangeland is "God's gift" and allows Somali nomads to have unlimited access to range resources. In principle, rangeland is open to all herders for grazing (SDR 1977), but pastoralists prefer to herd their livestock as much as possible within traditional tribal grazing areas (Herlocker 1986). The same applies to natural

water sources though access to dug wells, where they occur, is often limited to those who have created the facility. However, individual rights are maintained over arable lands (Box 1971).

Thus, the problem of overgrazing is said to arise principally from communal grazing of rangelands as theorized in the "tragedy of commons" popularized by Hardin (1968). The individual herder sees the range resource essentially as "God's gift" and if he does not exploit it, someone else will. Intense competition may thus ensue for the use of the scarce resource. Recent experiences in land tenure reforms, however, indicate that in most pastoral systems of livestock production in Africa, maintenance of some form of communal ownership is required and makes sense ecologically and economically (Lawry et al. 1984).

Abdi (1981) stressed that all ecosystems have a threshold - a breaking point beyond which recovery is difficult, if not impossible. Rangelands in Somalia are under pressure and this is forcing pastoralists to remain longer on permanent watering points. This results in over-grazing of the vegetation in the surrounding areas. In more technical terms, concentration of excessive numbers of animals in one area for too long results in the disappearance and demise of the more palatable and valuable species and their replacement by less nutritious vegetation. However, range vegetation in arid and semiarid environments has a remarkable resilience. Average annual rainfall and reduction in grazing pressure enable the rangelands to substantially resume their vigor.

c) Incidence of droughts

Since most of the rangeland under consideration is classified as arid and semiarid with low and erratic precipitation (with respect to timing and distribution), we should expect that the drought is a recurring, common phenomena which has temporal and spatial variability. Coughenour et al. (1985) have mentioned that problems like drought, famine and desertification are frequent phenomena in ecosystems where pastoralism is the primary method of resource utilization. Bothman (1975) has documented at least eight famines and droughts of various magnitude in Somalia over the last seventy years and indicated also the occurrence of drought of varying degree or severity in every four or five years. But, the uncertainty of the environment itself has been a powerful means of control. Periodic droughts and disease outbreaks are the twin elements that generally have kept animal numbers in a long-term dynamic equilibrium with the vegetation's ability to regenerate itself (Baker 1975).

The cyclical pattern of production and the impact of drought is becoming more pronounced (SDR 1977). The severe drought period of 1974-75 caused the loss of up to 30-40% of the animal population and made destitute 200,000 pastoralists. This was a clear symptom of the degeneration of the traditional system of production and increasing vulnerability of the ecosystem.

Thus, the sole productive use of the rangelands under such harsh milieu is to graze livestock under a system flexible enough to adapt to the sparse and erratic rainfall (Coppock 1985, Coughenour et al. 1985, Dyson Hudson 1984). The Somali pastoralists have developed a

system of production which minimizes the effects of droughts. They provide the best possible grazing to their livestock by dispersing their herds wisely. The expansion or build up of flocks is done in anticipation of the heavy losses which the next drought is bound to inflict (Lewis 1965).

Given the fact that drought is a recurrent phenomena, it is not surprising that Somali pastoralists have devised a number of viable strategies to anticipate its coming and to help mitigate its actual effects. Some of the salient drought strategies employed by Somali nomads are:

(1) the division of the family herds into small more specialized units. For example, the larger stock are separated from small stock and taken out to graze at some distances from the wells according to their differing abilities to go without water. This dispersal of livestock is a method of more efficiently exploiting every possible ecological niche in the drought-afflicted areas, (2) as drought persists, women, children and the elderly are often sent to stay with kinsmen or allies in the towns or farming villages (in the south). This strategy allows the young men to move more quickly with livestock from one locality to another (Cassanelli 1981), (3) the slaughter or sale of large numbers of animals is almost certain indication that nomads perceive the drought to be serious. Some evidence suggests that the sale of livestock in urban markets almost invariably increases in times of drought, despite declining prices caused by the deteriorating conditions of the animals (Cassanelli 1981). The rationale behind this strategy of selective depletion of

the herds appears to be two-fold: it reduces the pressure on the land by removing substantial numbers of animals and increasing the forage available to the remainder, and it provides the nomads with the means of obtaining food substitutes like rice, dates, sugar and grains, (4) there is evidence that some nomads confronted with drought seek temporary employment outside the pastoral sector. In most periods of drought there is an indication of a sizeable influx of nomads into the towns and agricultural regions of the south. These strategies are pursued on the assumption that the crisis will pass and the normal pastoral operations will soon be resumed. The pastoral strategies outlined above worked quite well in sustaining the pastoral enterprise through the first half of the twentieth century. The resiliency of Somali pastoralism is remarkable if one realizes the limited government interventions in the past, except in a marginal way to alleviate the consequences of drought.

d) Livestock

Traditional livestock production systems in Somalia involve camels, cattle, sheep and goats. These animals serve as an economic source of milk and meat, play an important role in the social life of the owner, and are a buffer against environmental uncertainties.

Herds are comprised of large milking stock, sheep and goats, providing the majority of the meat diet or sold for grain. Often herd composition is dictated by vegetation type and water availability. In northern parts of the country, camels are preferred over cattle because of the long distances between watering points and relatively larger browse component. Cattle are more prevalent in the

wetter, southern part of the country. Where possible, pastoralists maintain all four classes of livestock.

Animals are privately owned and their ownership is vested in the male household head who has full rights of slaughter and sale. Individualism and pragmatism are two main characteristics of the Somali nomads. Individuals make decisions about herd size, sale of animals and migration.

Livestock play a significant role in the social life beyond their economic function, providing a source of prestige and social currency in the formation and reinforcement of social ties as bride payments. This means that animals are not merely an economic resource to the owner but also an essential ingredient for the maintenance of social connections and obligations.

In view of the resource degradation that exists in many parts of the pastoral areas, pastoralists have been blamed for extensive destruction of the range resource from overgrazing, overstocking and their quantitative mentality of keeping and accumulating excessive numbers of livestock (Coughenour et al. 1985).

Such animal numbers are generally estimated to be far in excess of their basic needs (Brown 1971).

However, there is an important economic rationale behind the strategy of accumulation in addition to its social importance. Large herds can be seen as a form of disaster insurance or "precautionary motive" (Box 1971, Coughenour et al. 1985). The reasoning here is that by building up a large number of animals during normal years, the herdsman insures that at least some will survive the drought.

Both individually and collectively, the accumulation of livestock is a way of preparing for the inevitable onset of hard times.

Despite the fact that herders are often accused of irrational retention of stock, the assumption of economic irrationality has not been substantiated (Coughenour et al. 1985, USAID 1980). It must be appreciated that animals are a rational form of investment, not merely an irrational symbol of wealth and prestige. It is curious that while the attachment to livestock is considered irrational for herdsmen, investments in animals are frequently made by government officials, seamen and others, who have often worked for years overseas, for whom such investments are rational indeed (Lewis 1961, Aronson 1983).

Somalia supports a large number of well-adapted indigenous domestic animals which can withstand the harsh climatic conditions and diseases. It is apparent that each species has certain inherently valuable characteristics and limitations. Therefore it is pertinent to mention the characteristics of each species.

Camels. The single humped camel (Camelus dromedarius) is the only breed existing in Somalia. It is genetically uniform throughout the country, although there are differences in size associated with the environment. For example, the camel of the south is generally larger than that of the north, with a tendency towards darker coloring in the larger type (SDR 1977).

Although, in general, Somali camels depend mainly on browse for nutrition, it is well adapted to grazing and is capable of thriving on a diet which includes a high proportion of grass (Elmi 1985). It

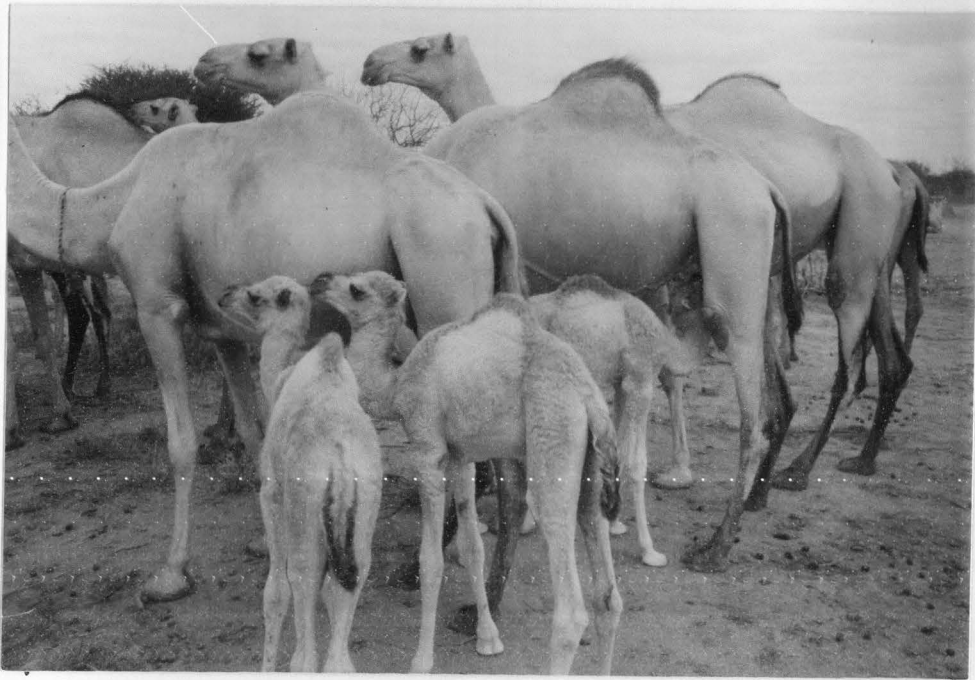
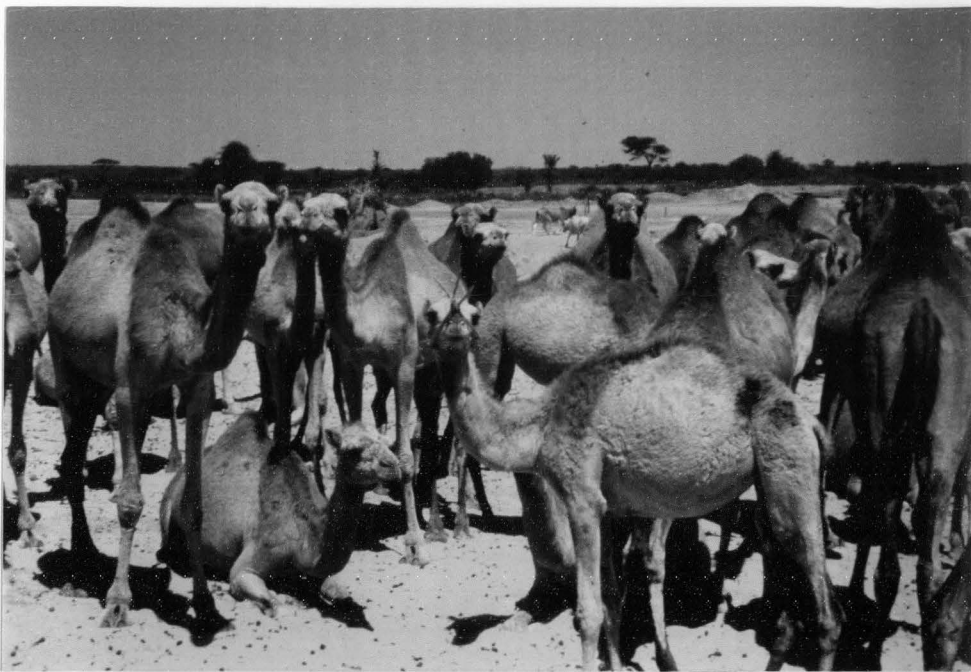


Figure 3 & 4. The camels are indispensable in the Somali nomad's search for pasture and water. They provide milk, meat, transport and social status to the owner.





is further distinguished for its exceptional ability to survive for long periods without water.

Camels are precious to the Somali pastoralists. They provide milk and meat for subsistence and sale and are used for transportation, draft, and hides (Elmi 1985). Due to the high demand and the importance of camels, they are not usually slaughtered or sold for export until fully mature (10 or 12 years) (SDR 1977). There is some indication that the "prestige system" may relate to the camel portion of the livestock industry (Box 1971).

Breeding rates for camels are not well known, but first calves are usually born at about 4 to 5 years and the subsequent breeding interval is about 20 months.

Cattle. The Somali cattle may be described as East African short-horned Zebu. These breeds are characterized by their short horns, but are sometimes polled. Somali cattle exhibit a wide range of colors and markings. Some of these breeds may be milked but they are generally more suited to meat production.

Somali cattle are hardy, adapted to the generally harsh environment and are relatively disease resistant. Even without genetic improvement, fertility and growth rates of cattle would respond to improved disease control and better nutrition.

Herds contain a high percentage of females because of the subsistence needs of nomads. When cattle are killed for human consumption, young male calves are slaughtered first, followed by older males and aged cows. In extremely dry years, all but the most valuable female breeders must be sold, killed or simply allowed to



Figure 5 & 6. Goats and sheep are usually herded together and not only provide meat and milk to the family but are also sold to meet recurrent household needs i.e. sugar, tea, cloth etc.



die.

Sheep. The only breed of sheep in Somalia is the Black-Head Persian which is a fat tailed, polled, hair sheep with a well defined black head and white body (Lewis 1961). Body weights of mature breeding females vary between 30 and 45 kg live-weight, depending on the influence of the environment and the management system.

Breeding of sheep is strictly controlled. Rams run with the ewes in November to obtain the primary lamb crop during April, which is the beginning of the Gu' season. Any attempt at improving the lambing percentage by breeding twice a year is related to the availability of forage, which is in turn related to the size of the main lamb crop.

Selection of breeding males is based on the performance of the lamb and the dam's background. One ram is kept for 30 to 35 ewes. Females are commonly culled for failure to conceive, weakness, and poor mothering. The average breeding life of the females allows five to six lamb crops depending on drought, and disease (SDR 1977).

Goats. The white Somali goat is found throughout the country. It is a dual purpose breed with short hair and short ears. Males are horned, but females may be horned or polled. Colored spots and patches do occur but the animal is generally all white.

The goat is a major source of milk in the most arid regions and in areas of heavier bush in the south. Goats are counted and normally managed with sheep as one herd, but the management varies in that the breeding season in goats is less specific (Lewis 1961, SDR 1977). In the absence of drought, goats breed three times in two

years, and in some cases twice in a year. The does on average produce five to six kids.

Donkeys and Horses. Donkeys are raised purely as a beast of burden and are common in the towns and in some of the more arid areas. Horses, though in short supply today, retain their value as the prestige possession "Par excellence" (Lewis 1965), and are ridden on ceremonial occasions.

## CHAPTER 3

NOMADIC STRATEGIES FOR SURVIVALA. Mobility

Mobility is the primary means by which Somali pastoralists compensate for the sparse and unpredictable forage resource which characterizes the arid environment (SDR 1977). The more arid the environment, the higher the variability, the more important is mobility for long-term survival (Dyson Hudson 1984).

Because of the unpredictability of the rain patterns, Somali nomads have to be continuously concerned with decisions about migration. As the rain patterns shift within and between seasons, so does the grazing pattern. Abdi (1981) mentioned that traditional nomadic movements in Somalia closely followed seasonal rhythms of climate and vegetation.

As a strategy for coping with the unpredictable and sparse grazing resource of Somalia, mobility reflects the continuing search for forage within a patchy, fluctuating resource. This movement can be either opportunistic in more arid areas or partly cyclical based on seasons.

Exploitation of seasonal pasture is not the only reason why livestock herders move. The use of livestock as a method for exploiting the range resource gives the nomadic pastoralists the option of moving to avoid a wide range of hazards in the physical and social environment, an option not generally available to farmers.

Pastoralists may move with herds to avoid insects, diseases, and to reduce competition with other groups. Therefore, mobility is both a crisis-survival mechanism and an effective strategy for long term exploitation of the resources (Dyson Hudson 1980).

Moving herds to seasonal pastures is a widespread response and represents a way of producing human food which does not demand large investment (Dyson Hudson 1980). Moreover, the environmental factors are numerous and varied and include the nutritional and economic needs of the livestock owner and his family, the availability of natural pasture and water, and the location and timing of markets for sale of livestock.

Somali nomads value their ability to move freely in search of pasture and water sources. They are continuously concerned with the question of when and where to move their herds. The pressure of limited water and pasture often necessitate migratory movements. With the onset of the rainy season, pastoralists disperse widely to exploit pastures which are too arid and inaccessible to be grazed during the dry season (Lewis 1961). This dispersal is still a cautious one, however, in so far as men are normally sent ahead on foot to confirm reports of where rains have actually fallen. While nomads are prepared in principle to move wherever it rains, the special attraction of their traditional grazing area (degaan) gives rise to patterns of movement that tend to be repeated.

On ranges used for wet season grazing, water is often limiting during the dry period. Nomads retreat to their home base during dry seasons where they enjoy the security of reliable water supplies.



Figure 7 & 8. Male camels in pastoral areas of Somalia serve as a means of transport. The supporting poles, covering mats, and household belongings are dismantled and transported by camel when the people and their herds move on.



This movement back to their dry season water supplies provides the opportunity to use pastures reserved for this period. Thus, water is the key to pasture accessibility. In dry seasons, nomadic movements still occur, though restricted, and are confined by the need to water animals regularly, often from the same well, until the onset of rains allows dispersal again. Therefore, the distribution of water points and seasonal distribution of rainfall have led to well-defined patterns of nomadic movement.

Changes in vegetation type affect nomadic movement. For example, the wet and dry season grazing areas might be characterized by two different vegetation types. The wet season area may be rangeland dominated by annual grasses with short life spans so grazing is only possible in the rainy season. On the other hand, the dry season area may have perennial grasses or shrubs.

The pattern of nomadic movement of Somali pastoralists is depicted schematically on Figure 3 indicating migrations extending across the border with Ethiopia into the Hawd grassland and other parts of Ogaden. The direction of movement varies in different parts of the country. For example, the nomadic movement in the central region is roughly on an east-west axis and ranges from coastal areas to as far as the Hawd and other parts of the Ogaden. In contrast, movement in the northern part of Somalia is along a north-south axis moving southward into the Hawd in the rainy seasons and retreating northwards during the dry seasons. Whatever the direction of movement, the objective is to fully utilize variable resources. B-



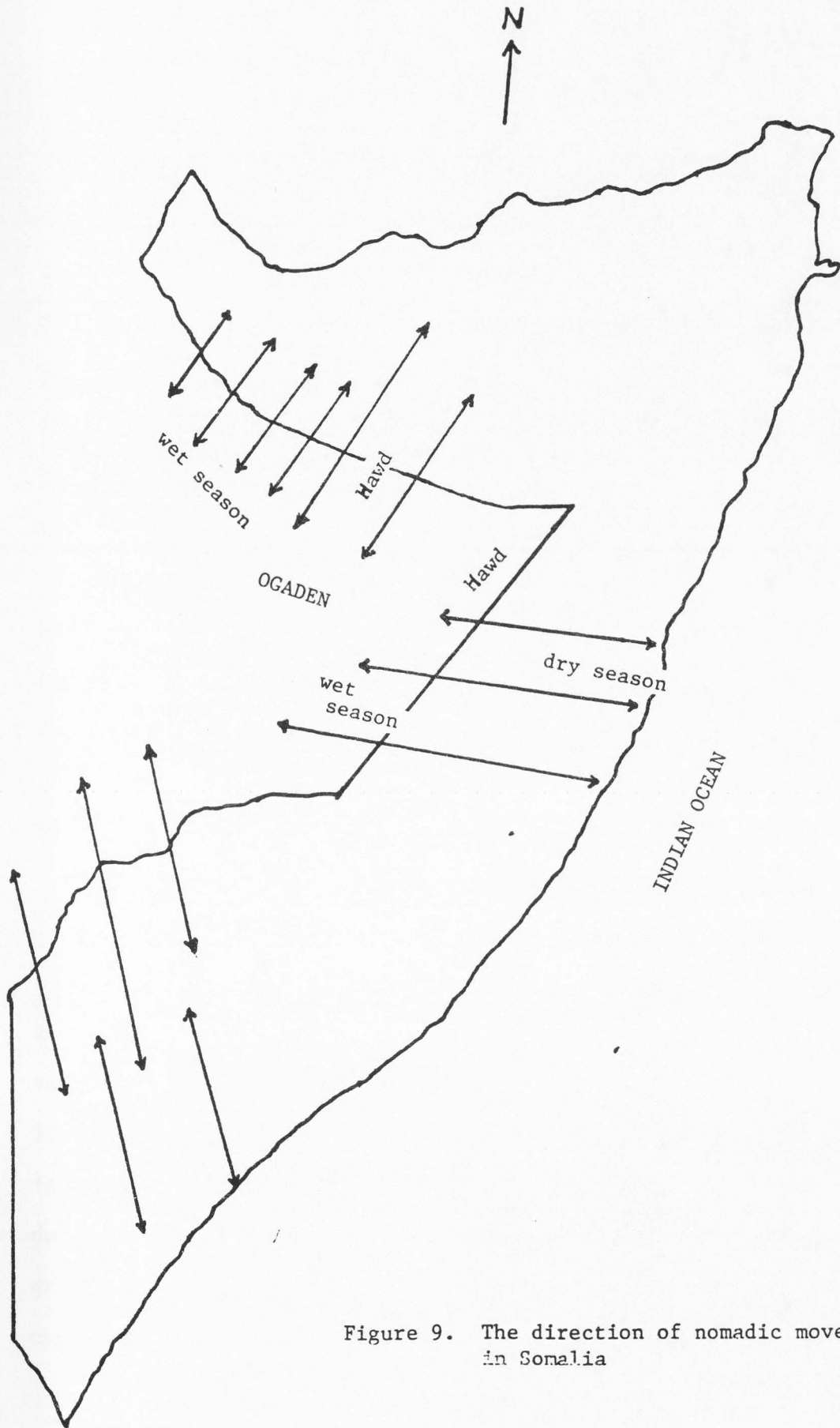


Figure 9. The direction of nomadic movement in Somalia

### Mixed species of livestock

Livestock development interventions to date have focused on cattle and ignored other species of livestock such as small ruminants and camels which are equally important (Dwyer 1986, USAID 1980). Elmi (1985) emphasized the importance of camels in the traditional pastoral production system in Somalia. Swift (1977) recorded that of Sheep and goats constituted 95% of Somalia's live animal export. Camels formed 2.5% and cattle formed only 2% of Somalia's animal export.

Diverse mixtures of livestock species are crucial to form a buffer against catastrophe (Coppock et al. 1985), as well as mobility and a social network of reciprocity. These are all common forms of adaptive resource use strategies of nomadic pastoralists in the arid and semi-arid environments (Behnke 1985, Coppock et al. 1985, Coughenour et al. 1985, Dyson Hudson 1984, Goldschmidt 1981).

As shown by Coppock (1985) and Coppock et al. (1986), different livestock species used in arid environments by nomadic pastoralists have both ecological and economic implication. It is a widely accepted fact that different animal species can utilize different ecological niches much more efficiently than single species (Brown 1971, Coppock et al. 1986, Coughenour et al. 1985). Camels, for instance, are effective browsers, deriving most of their forage from dwarf shrubs and other woody vegetation. Cattle are essentially grazers of grasses. There is considerable variation in diet composition among livestock species.

The diet composition of each species of livestock in Turkana

pastoral groups has been calculated across all seasons by Coppock et al. (1986), as shown in Table 1. Large stock tend to be more specialized feeders and have very low diet similarity. For instance, 95% of camel diets are comprised of dwarf shrubs and other browse vegetation, where as 96% of cattle diets are grasses and forbs (Table 1). It is worthwhile to mention that both Somali pastoral nomads and South Turkana pastoral groups employ similar survival strategies in response to an unpredictable environment, i.e. four species of livestock. Thus, multi-species herds composed of livestock with

Table one. Diet composition among four livestock species in %.

Species	herbaceous %	dwarf shrubs	other browse forage
Camels	5	72	23
Cattle	96	4	0
Goats	36	27	37
Sheep	67	28	5

source: Coppock et al. 1986.

different grazing and browsing habits provide a very broad, opportunistic, and temporally stable trophic niche that has resulted from the equitable use of all forage classes, and their mobility has provided a means of exploiting extensive areas (Coppock et al. 1986). Coughenour et al. (1985) noted that camels are the most efficient livestock in terms of ecological efficiency, while sheep and goats are the least. Despite the well documented adaptability and ecological efficiency of African dromedarys to the arid and

semiarid environments, the camel engenders no interest at all among development planners.

Each type of livestock not only provides nomads with a different set of resources, but each plays a different role in the nomad's subsistence economy. For example, the most reliable source of food for nomads is milk from camels (Coughenour *et al.* 1985). Most camel forage is derived from dwarf shrubs and other woody plants which maintain green biomass much longer into the dry season than the herbaceous plants which constitute the main diet of cattle. Camels and cattle vary in their milk yielding characteristics. Camels provide the greatest quantity of milk in all seasons and are most dependable during dry seasons and droughts. Cattle milk, on the other hand, is the second most abundant human food on an annual basis, but it is available in quantity only during the wet season while herbaceous plants are actively growing (Coughenour *et al.* 1985). Research studies on pastoral Turkana with mixed species of livestock indicated that a yearly average of 49% of the camels were lactating compared to 26% of the cattle and 16% of the sheep and goats.

In addition, small stock (sheep and goats) are a more convenient form of meat supply than cattle or camels; when killed they produce meat which can be readily consumed in two or three meals by the family preventing spoilage losses. Only on rare occasions are camels slaughtered for home consumption, e.g. at wedding feasts or religious ceremonies. Cattle contribute milk and purified butter and can be slaughtered. Small stock are also important, not only in terms of

meat and milk supply for the nomadic family, but also provide a smaller disposable unit for sale when cash is needed. Small stock are most frequently sold to meet recurrent household needs such as clothing, sugar, grain, dates, etc. Like cattle, their milk can be processed into ghee.

Another advantage of the combination of the different species of livestock relates to the different water requirements. In arid and semiarid areas of Somalia, cattle need water every two days. Thus, the grazing distance from a watering place are short. This is probably the reason why overgrazing is common around water points, where nomads spend the dry season. On the other hand, camels can graze about 70 km from water during the dry season and only need water every 15 or 20 days as shown in Table two. Williamson and Payne (1977) have also stated that camel can withstand a considerable degree of dehydration, and in a hot dry environment, camels can tolerate the loss of at least 27% of their body weight.

Table two. Watering requirement of the different species and corresponding distance from water.

Livestock species	Days between watering (dry period)	Equivalent grazing distance from water (km)
Camels	20	70
Goats	6	20
Sheep	4	5
Cattle	2	5

A major advantage of grazing a mixture of livestock species, which is often underestimated, is the variation in reproductive

cycles and spans between each herd species. This results in different rates of herd growth for each type of animal. Herds of small stock, given their faster rates of maturation and reproduction, will expand faster than the same sized herd of camels or cattle. Small stock are therefore a more attractive herd animal for a family that wishes to build up its livestock holdings rapidly (Behnke 1985). Cattle also reproduce more quickly than do camels, but this factor must be weighed against the lower survival rate of their calves. The fact that camels are the most drought resistant of all four species may in some instances outweigh the disadvantage of their less precocious reproductive rate.

Given the attributes and liabilities, it is evident that no single species is considered sufficient individually. It is ecologically and economically sound for a pastoralist to keep a mixture of small and large stock. By adjusting the species mix of their livestock, with the degree of mobility of these animals, Somali pastoralists are able to exploit an environment which could not be productive otherwise. The characteristics of the different species of livestock raised by Somali pastoralists are summarized in Table 3.

Table 3. Characteristics of the different species of livestock in Somalia (adapted from Behnke, 1985).

	----Biological Characteristics-----			-----Productive Characteristics-----			
	Reproductive rate	Food requirements	Water requirements	Dairy Products	Meat	Sales Exchange	other uses
Camels	12 month gestation 5-10 calves/ female	dwarf shrubs, trees	every 10-20 days in dry season; none in wet season	milk	rare, only ceremonial occasions	highest market value	Burden
Cattle	9 month gestation. 7-12 calves/ female	grasses & other herbaceous vegetation	every 2 days dry season as well as wet season	milk ghee	infrequent only important occasions	often to obtain grain	hides
Goats and Sheep	5 month gestation	shrubs forbs & grass	every 3-5 days dry season little or none in wet seasons	milk ghee	frequently on religious festivals & for guests	frequently to obtain cash for household expenses	hides

c) Animals as Capital

Pastoralists pursue many goals. Their economics require strategies for short-term productivity and longer-term insurance. They also clearly regard their herds as banking and investment devices, so that they will try to keep some small stock as liquid assets or for consumption purposes. After a severe drought, pastoralists convert their remaining large stock to small stock to take advantage of higher growth rates.

Crotty (1980, p. 119) described the role of cattle in nomadic societies:

"Cattle have important advantages as money in a predominately pastoral society. They are directly useful as sources of milk, blood, and meat and do not have to be first converted like coins into consumable products, that may not always be available in a vast continent with poor communication and little commerce. Like money in deposit they increase and multiply, at little cost or inconvenience to the owner; but unlike currency, they have an inbuilt hedge against inflation. Perhaps of greatest importance to a people who especially in the past were frequently and necessarily nomadic, cattle are mobile, while other sources of wealth including coins must be transported from place to place, cattle move themselves and can if necessary, transport other forms of wealth also. Cattle for this reason are an attractive asset for pastoralists to hold. This very attractiveness adds an additional element of attractiveness to cattle as an asset: it confers on the holder of the cattle in a pastoral society security and status, as money in the bank does in sedentary societies."

Halland (1977) pointed out another characteristic of livestock which makes this investment more attractive than other forms of enterprise: the fact that investment in cattle is possible without benefit of any economic institution. Since one of the main products of the herd is lambs, calves etc. the production of offspring is an increase in the capital stock of the owner.



In view of the increased pressure of reduced carrying capacity that exists in many parts of pastorals world, nomads are charged with the notion that they keep large numbers of livestock without any concern to the productivity of the environment. Although there is some truth to this, there are pragmatic reasons and several important adaptive strategies related to the accumulation of large numbers of livestock as mentioned earlier. Swift (1977) has argued that large herds are the adaptive response of a subsistence economy to the demands of a difficult and variable environment. Brown (1971) attributed the nomad's large number of stock to the subsistence needs of the nomads and his family.

Thus, the presence of large numbers of animals is a hedge against environmental hazards. In an environment so characterized by frequent droughts and outbreaks of disease, a person with larger numbers of livestock is in a better position than one with fewer animals at the beginning of the drought. This provides nomads insurance for what is obviously a high risk enterprise. There are also other uses of livestock which serve to strengthen one's status in the community. The borrowing or loaning of livestock is a means of gaining friendship, which can be useful in times of need. Equally important is the role livestock play in the payment of bride prices.

## CHAPTER FOUR

### RANGE DEVELOPMENT PROJECTS: PAST AND PRESENT

Range development began in Somalia in the 1930's under the British who instituted the first Somali range grazing reserves. These reserves, situated near villages, were used primarily by village livestock (SDR 1977). During the two wet seasons and early dry seasons, these reserves were protected from grazing by local range guards, then opened for grazing later in the dry seasons. These reserves apparently gained a measure of acceptance but collapsed following independence due to lack of funds and lack of any well founded institutions to maintain them (Herlocker et al. 1985).

Because the rangelands are crucial to the survival of the majority of Somalis and to the national economy, the Somali government has endeavored to develop national development strategies which placed major emphasis on the range development subsector (SDR 1982). Range development has been primarily carried out by four successive projects. The first three were in the North: Survey of Northern Rangelands (1970-1972); Rangeland Conservation and Development Project (1972-1973); and the Northern Rangelands Development project (1977-1985). These were followed by the on-going Central Rangelands Development project (1979 - present).

No other development projects have been directly involved in range management. However, almost any agricultural project in the country is apt to have some range-related implications. In 1976, it

was realized that the provision for an agency for planning and co-ordination of range activities was essential, and subsequently led to the establishment of the National Range Agency. It is an autonomous agency with country-wide responsibility for construction and development of range, forest, and wildlife resources. It also became the executing agency for both the Northern Rangelands Development project and Central Rangelands Development project. Child et al. (1984) mentioned the failure of range projects which have suffered because of a lack of government agencies to handle management activities as well as the necessary follow-up.

A. Survey of Northern Rangelands Project (1970-72)

The UNDP/FAO Livestock Development Survey of 1966 drew attention to increasing range deterioration in the northern part of the country (FAO 1967). This eventually led to the Survey of Northern Rangelands Project which brought the Government face to face with the complexity of the issue of range development. Although this project was originally intended to inventory range and livestock resources in two northern regions, it was early on required by the Government to include a development component.

Seventeen range reserves were established to improve vigor and productivity of rangelands and provide dry season grazing (FAO 1972). The results were varied. It was found that range reserves should not be managed as isolated units and without reference to traditional grazing areas.

Overall, the largest problem was the lack of trained staff and the poor administrative infrastructure. From this, ultimately came

the push for the formation of the National Range Agency. The most serious problems concerned the inability to gather baseline data about the range and livestock resources, and the division of limited resources into immediate development activities that ultimately failed due to hastiness, poor planning and a basic ignorance of the rangeland system being developed.

B. Rangeland Conservation and Development Project (1972-1973)

The survey of the northern rangelands provided basic information for the formation of a rangeland conservation and development project. This project stressed the development of fodder production units using flood irrigation, and the increased quality and area of grazing reserves (Naylor 1977).

Although some useful experience was gained from fodder production trials, the fodder production units were found to be of dubious economic value because the construction and maintenance costs for structures (dams, bunds) exceeded returns from fodder production. It was also discovered that simple protection of degraded rangelands usually resulted in fast recovery of the vegetation providing adequate forage at much lower cost. This was important because estimates indicated that up to 50% of all northern rangelands were severely eroded and required such protection (FAO 1972). This survey also found that 20% of the rangeland in this zone were degraded so badly that it would require either mechanical treatment or long periods of protection to rehabilitate them.

Ranching co-operatives were introduced as a method to carry out range development and conservation activities and to instigate needed

reforms in land tenure (Naylor 1977). The major problem was that cooperatives were overlarge, occupied the best land and could continue to use adjacent communal land while excluding outsiders from cooperative lands. Grazing reserves were also retained but were extended to include all communal lands and organized to have rotational grazing systems with 25% of the area being rested at any one time. Unfortunately, this project ended prematurely because of financial crisis. Nevertheless, it was said to have considerably influenced the design of both subsequent projects.

C. Northern Rangelands Development Project (1977-1985).

This project, which was designed as a part of the drought rehabilitation program, had as its objective to correct rangeland deterioration, to continue to form range reserves to develop fodder production units, and to initiate veterinary and stockwater services (FAO 1976).

A large number of reserves were established. These were of different types (drought, seasonal) for different groups of people (nomads, villagers, traders) and were under different concepts of ownership i.e. government, co-operatives and local grazing associations (Herlocker et al. 1985). The results were generally poor because of a lack of technical, financial and extension support and follow-up once reserves were formed. This was caused by a serious lack of trained staff. It was apparently assumed that, once formed, reserves could continue on their own, which was a real mistake.

Despite the findings of the previous project that fodder

production units were of doubtful economic value compared with less expensive measures of forage production, and the need to increase emphasis on rangeland rehabilitation, fodder production units were the principle feature of the NRDP. Most of the project's resources were concentrated on this activity because of a need to use limited trained personnel to meet at least one of the project objectives.

However, the fodder production units were found to have been poorly planned and hastily built. They should have been preceded by development of a program to supply adequate seed and plant materials for planting. The project then recommended that less effort be put into fodder production in the future and that those efforts should be more carefully carried out. Rangeland rehabilitation efforts were apparently limited to a few trials, the results of which were largely lost. Some local species were found to work well and were locally available for collection of seed where grazing was controlled. Some fenced enclosures were built to determine rangeland potential.

The principal problems encountered by the range development projects were poor and inadequately trained staff, poor administration infrastructure, lack of baseline data on which to base and monitor development activities, and long delays in providing expatriate expertise in country. However, there were several good points. The continued development regarding the best type of reserve to use for introducing management interventions and reforming land tenure was one example. The emphasis placed on the need for rangeland rehabilitation and the formation of the National Range Agency to consolidate and direct all range activities were additional

strengths. But the general impression of the last phase of the Northern Rangelands Development Project is that it was a failure primarily because of administrative, staffing and logistical problems. These are the same problems that have staggered all previous projects in the north.

D. Central Rangelands Development Project (1979 - present).

The CRDP evolved from the preceding northern rangelands projects. The original objectives of the project, as outlined in the World Bank report (1977) were: to consolidate and improve rangeland and livestock production, to improve pastoralists income, and to encourage, by improved range management, the gradual concentration of pastoral communities as this was considered conducive to the provision of social services.

The objectives of the project were to be achieved by aerial and ground surveys of rangeland resources, socio-economic surveys of the pastoral economy, and continuous dialogue with the pastoralists, leading to the location of grazing reserves, the formation of range and livestock associations, and the development of water supplies (Mascott 1985). At the same time, the non-formal education of the pastoralists and the formal training of the project personnel were to be implemented, as were the strengthening of the National Range Agency, and the development of veterinary services.

Thus the CRDP, as originally designed and formulated, was a complex and multi-component project extending over approximately one-fifth of the land area of Somalia. Not only was management complicated and communication difficult, but there were also

inadequate data available on which to base management interventions, and there was a limited understanding of the pastoral socio-economic environment.

As a consequence, a consensus began to develop that the original objectives were unattainable within the project period and that the direct and indirect benefits expected from the interventions could be insignificant. In addition, it was concluded that the vast area of project responsibility made supervision extremely difficult and that a weak organization and management structure had resulted in deficient work planning and poor control of resources and staff. Specific changes in the project design and management were modification in the design of the project so that most components to be implemented were on a district by district basis, and a reformulation of the veterinary component as well as the water component.

Experience gained by the CRDP to date has shown that the successful completion of the project's objectives will be slow and necessarily based on careful ground work, program development, training, surveys, dialogue with the pastoralists, planning and subsequent follow-up with the pastoralist to maintain dialogues and co-operation. Project planning is a very crucial aspect of every resource management program as emphasized by Gay and Bartel (1986).



## CHAPTER FIVE

### DEVELOPMENT APPROACHES AND THEIR CONSEQUENCES

During the last three decades, Somali pastoralism has begun to have detrimental effects on local range resources primarily due to overstocking and overgrazing that have outstripped the basic productive capacity of the natural environment. An imbalance has been created to which the term "Desertification" can aptly be applied in the most serious case. Paradoxically, much of the detrimental effect has been either caused or exacerbated by poorly designed and highly erratic development schemes and policies that were imposed on nomadic pastoralists during those times.

In the traditional Somali nomadic pastoral ecosystem, human and animal populations were maintained in a fluctuating but ecological balance with each other and with the land by natural control mechanisms. These control mechanisms include scarce and variable rainfall, drought, and disease (Swift 1977). However, recent changes aimed to alleviate constraints and limits in livestock production such as water development and disease control have created ecological imbalance. These are viewed by many development planners, who profess the goal of economic development, as ends in themselves rather than a part of an overall management strategy. Baker (1975) classically described such interventions in Uganda as treatment of symptoms rather than the problem itself. In such a marginal pastoral ecosystem, the removal of one check element not only results in

imbalance, but also will have far reaching repercussion throughout the system in a short space of time.

Ecosystem changes brought about by development affect tremendously the life style of pastoralists. Unless one is closely involved with rangeland development in pastoral areas of Africa, it is difficult to understand how such development can affect the present pastoral ecology. Unfortunately, most development projects seemingly avoided the subject of pastoralism without an assessment of the ecological and economic efficiency of pastoral systems (Dwyer 1986). The degree to which this occurs can significantly affect the outcome of the best designed projects.

Since the date of Somali independence, six development plans have been launched. Several of them were aimed, with regard to the livestock sector of the economy, to increase livestock production by removing the obstacles to increased production and by creating an additional productive capacity. In order to achieve these aims, some of the measures proposed an improvement in animal health through better veterinary services and an increase in water supply to open up new grazing lands. Others were based on innovations regarding organizational systems, merely changes in the existing land tenure.

#### A. Water Development

In arid and semiarid areas the development of new water supplies has been, and for the most part still is, the overwhelming form of development most sought after by pastoralists. Enthusiasm for new water development remains strong (Sandford 1983). Range management naturally involves the availability of water in suitable quantities

and qualities at the right place and time (Stoddart *et al.* 1975). This represents a serious problem in arid and semiarid where pastoralism exists.

Perhaps the most obvious solution to the problem of nomadic pastoralists in Somalia is to dig wells to provide water. The evidence suggests that this solution universally not only fails to solve immediate problems but exacerbates the pastoralist situation. There is no doubt that development of water points is crucial for the well-being of both nomads and their livestock but unless accompanied by a well devised grazing management plan, its long-term destruction of the environment may outweigh its immediate benefits.

Traditional water points have been of two general types: (a) natural collection points on the surface or in high water tables following the rains; and (b) hand-dug wells, maintained and controlled by those who built them. Both these surface collection points and shallow wells naturally dry as the year progresses, forcing herders to move on to allow the range time to regenerate.

Many bore holes have been drilled in many parts of the country by both donor agencies and the Water Development Agency. Also, many artificially cemented reservoirs (Berkeds) were built by livestock merchants, rich pastoralists, Somali sailors and others who returned from abroad with money (Lewis 1961). There is no indication of any instances in which the use of wells has had any positive effect (Goldschmidt 1981) and yet the Somali Government in one of its development plans included the drilling of 300 deep wells (SDR 1977).

This increase in water availability has had an important ecological consequence. Often water availability was the limiting factor regarding animal numbers. The increase in watering points has removed this natural control and has led to a large increase in the numbers of animals, and consequently, degradation of traditional grazing areas surrounding them. The potential for range degradation exists with a corresponding increase in the number of bore holes. Sanderson (1986) blamed the degradation of Somalia's rangelands on the sharp increase in water points. Box (1982) also mentioned range deterioration in Somalia where range improvements have been established, especially the development of bore holes and additional stock water. Similar cases of degradation concentrated in immediate proximity to deep bore holes were reported elsewhere in Africa (USAID 1980).

Such increases in watering points, particularly the privately owned reservoir, also had social consequences. Many of these reservoirs (Berkeds) are open only to those who can pay for the water rather than the collective property of kinsmen who dug them. This has encouraged the intrusion of new pastoral groups into grazing areas which were previously under the defacto control of groups with traditional water rights in the area. These factors have led to further breakdown of traditional grazing disciplines.

Therefore, the result of water development programs was to spread the destruction of grazing resources into areas which had been conserved by lack of water, to increase the grazing pressure on range resources in these areas and, eventually, to worsen the overall

situation. There had been no parallel programs of grazing management or culling despite assertion by planners that programs should be integrated.

In conclusion, many well-intentioned water development interventions, although beneficial in the short run, had disastrous long term effects. The construction of permanent water points caused an over-concentration of livestock in proximity to them, and consequent vulnerability when rainfall declined and the forage became insufficient. This has resulted in near irreparable damage to the vegetation and soil.

#### B. Veterinary Intervention

Disease control is the most important form of animal improvement that has been attempted. It has regularly met with acceptance by the pastoralists and has often led to dramatic increases in animal numbers. The result of this success has unfortunately, most often, been disastrous. Decreased livestock mortality exacerbates problems of over grazing. USAID (1980) indicated that veterinary intervention has enjoyed, by and large, the best assessment of all donor activities in the livestock production system. Such interventions remain attractive, are promising and have high payoffs (USAID 1980). Major emphasis has been given to the control of disease and improvement of animal health in Somalia. This is considered the quickest and most economic means of achieving increased offtake and higher productivity.

The introduction of disease control programs began as a national campaign launched to eradicate the threat of many livestock diseases.

Emphasis has been placed on prevention rather than cure of disease. Vaccination against rinderpest was introduced to an optimum level and the disease was virtually eradicated. Vaccination against other major diseases, for which locally produced vaccines are now available in adequate quantities (e.g. contagious bovine pleuro-pneumonia, contagious caprine pleuro-pneumonia, anthrax, blackquarter, haemorrhagic septicaemia), has been developed on a strategic campaign basis rather than outbreak control (SDR 1982).

Also, the supply of drugs and medicines has been rationalized and improved. Surveys have been conducted to determine the occurrence and economic significance of diseases and various parasites to expand the knowledge of animal health problems. Specifically this included a tick and tick-borne disease survey, internal parasite survey, as well as Tse tse fly survey. Further effective control measures have been implemented. Among these include the development of the Serum and Vaccine Institute and Central Laboratory, and the establishment of the Northern Laboratory and several smaller regional laboratories.

However, although the program was successful and virtually removed another major check in livestock number, the unintended consequences have led to frequent deterioration of the environment. As a result, this has threatened the survival of pastoralism as a viable production system.

Just as water development had no complementary grazing program, so disease control had no parallel marketing program to accommodate excessive stock numbers on the rangeland. However, in anticipation

of increased numbers of stock, attempts have been made to remove bottlenecks and constraints that inhibit exports.

There was, as a result of water development and disease control programs, an excess of livestock in relation to seasonal grazing under unimproved range management. Thus, there were no improvements in any aspect of the livestock production economy other than water and disease control and this subsequently led to range resource degradation.

Goldschmidt (1981) described two basic flaws in planning programs and projects. One is lack of appreciation and recognition of pastoral people's own knowledge. The other is lack of coordination among different components of a project. This points out the importance of understanding the complexity of the social, economic, cultural and environmental factors in the pastoral way of life (Dwyer 1986). Somalia's checkered history of pastoral development can serve as a classical example of these criteria.

C. Establishment of Range and Livestock Association  
RLA or Grazing Association

The need to conserve fodder, in situ, for dry season use has been known in Somalia for generations. During the past 50 years many attempts have been made to organize local people into groups or associations which would accept responsibilities for the management of communally owned rangeland, with specific objectives of reserving fodder for dry season use.

Ranching co-operatives and grazing associations were introduced as a means to carry out range development and to instigate needed reforms in land tenure. Even though grazing co-operatives were

preferred to alternative types of land tenure reforms, any type of reform in pastoral areas faces similar problems of achieving equity in land adjudication while maintaining the flexibility and mobility demanded by climatic conditions (Holt 1986). The co-operatives in the North encountered similar problems as those experienced by many other land tenure schemes for nomadic pastoral range areas in countries such as Kenya and Botswana (Sandford 1983).

The pastoral organizations were subsequently called Range and Livestock Associations (RLA's) as provision had recently been made for their existence in Somali law. However, neither Somali law, various project designs, nor the limited previous experience with co-operatives and grazing associations, had provided guidelines for their proposed membership, structure, size, function and responsibilities (Holt 1986). Thus it can be concluded that both project designers and national policy makers have underestimated the difficulty of establishing effective, communal, nomadic pastoral organizations where none had existed before.

In general, the results of these endeavors have been disappointing. There are probably many reasons for the poor results not least of which is the erratic rainfall pattern which necessitates the movement of livestock over great distances in search of fodder in times of drought.

Apart from the already discussed interventions in the form of water development and veterinary service, development trends since about 1950 have contributed to the transformation of pastoralism in Somalia, and have begun to threaten the survival of pastoralism as



the central means of livelihood. The most important indication of this is the defacto existence of numerous small pastures and farms through the northern region. This increased private appropriation of what had previously been communal resources is a result of the shift from subsistence to commercial pastoralism and the increasing monetarization of the pastoral economy (Swift 1977).

The major consequences of increased commercialization of pastoralism are not merely increased private appropriation of resources, but also increased economic stratification and disappearance and breakdown of the traditional social security system by which herdsmen are protected against the risks of an unreliable environment. These have rendered the nomad's traditional adaptive strategies, at least, far less effective in maintaining the long-term viability of pastoralism.

## CHAPTER SIX

### RECOMMENDATIONS AND CONCLUSIONS

Since the size and economic importance of Somali's nomadic pastoralism is unique in Africa, solutions that are specific to the situation are required. New, comprehensive policies for pastoral development have to be clearly defined, and should take into account the complexities of the pastoral ecosystem.

Under ecological and economic conditions now existing in Somalia, nomadic use of the land is the best utilization of the resource. Present ecological conditions dictate that Somalia will primarily be a livestock-producing country. Therefore, any development plan should consider the basic factors contributing to the nomadic existence: that nomads inhabit a highly variable environment and that production is always faced with risk. A way of reducing this risk should be explored. Of course, the major climatic element (rainfall) cannot be modified, at least in the current level of technology, but precautions can be taken to ameliorate its effect when it fails. This means the development of institutions where nomads can make their investments both in cash and kind in good years. In this way, the large build up of herds can be reduced, and the ranges can recover.

Important to the future of the livestock industry and the betterment of the livelihood of the country's pastoralists is proper management of the rangeland where scanty, erratic rainfall make them

suitable only for livestock grazing. Over time, a pattern of grazing and herd management have been developed by the nomadic pastoralists that fit the ecosystem and its periodic droughts and diseases. However, the introduction of development interventions and changing circumstances has resulted in reported environmental degradation caused by widespread overgrazing. The factor believed mainly responsible was increasing herd numbers which had been made possible by better veterinary disease control and greater water supply.

Previous development projects have tended to address single components of the system without regard to their linkage with other components of the system. Provision of water supplies without adequate consideration to the carrying capacity of the range is an example. Better veterinary services without parallel programs of improved marketing is another example. Therefore, the solution to problems inherent in utilizing the range resource of Somalia will require a concerted, integrated and multi-disciplinary approach. Initial attempts to improve range development and management projects have met difficulties in large part due to the shortage of qualified personnel. The principal constraint to further range development is the severe shortage of adequately trained people to plan and implement the programs.

Another important consideration is the deteriorated condition of much of the rangeland and the need for bringing livestock numbers into balance with forage resources in the face of strongly fluctuating seasonal and annual production as a result of low and erratic rainfall and recurrent drought. At the same time, increasing

human population demands more and more from the livestock and range resources in terms of food.

The importance of the rangelands, and the livestock and humans they support, make it imperative that every effort be made to halt desertification and to increase livestock production on a sustained yield basis. It is necessary to make a sound analysis of the problems that exist and to begin their resolution in the short- and long-term, although range livestock management programs are rarely short-term in nature, particularly in arid and semiarid climates.

Research to resolve the problems associated with managing rangeland and utilizing these lands for producing livestock on a continuing basis is essential. It would seem logical to initiate a research program with an understanding of the local pastoral ecology supplemented by a collection of an ecological baseline data set. Considerations of nomadic movement patterns, types and amounts of livestock, and the selling of livestock and their products would appear to generate sufficient questions to begin serious hypothesis testing. Forcing development policies and livestock management systems of the developed countries upon pastoralists without knowledge of pastoral ecology and without their co-operation will cause a well intentioned project to fail. Therefore, research is needed to mitigate the impact of a dynamic environment.

A more relevant and feasible focus for research would be to examine the areas around several newly developed water points, preferably immediately before and sometime after the completion of the well. Some research and monitoring programs should accompany any

attempt to develop water points under arid conditions in Somalia. Also, it is advisable that a National Range Research and Development Committee be organized to enhance cooperation, review problems, determine priorities, and ensure smooth functioning of range research and development programs.

There is no doubt that Somali pastoral nomadism can lead to ecological problems. Given a certain level of aridity, it is the only means of land use, however, the risk of resource degradation is likely to occur whenever the number of livestock exceed the carrying capacity of the land. Therefore, a strong extension service should be developed in order to gain confidence and support of the pastoralist who will be affected by the change, despite difficulty in terms of distances involved, and the scattered and mobile nature of pastoralists and their herds.

Given the fragile ecology of the pastoral ecosystem, it would be more sensible to develop a pastoral system that would reduce pressure on rangeland, and, at the same time, increase long range economic security for the pastoralists. The only way of achieving these objectives would be to stabilize population growth and prevent overstocking. The future of Somalia lies in pastoralism.

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